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Factors Associated with Cardiopulmonary Resuscitation Performance Among Medical Students at Enugu State University of Science and Technology, Nigeria

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Abstract: **Background:** Cardiopulmonary resuscitation (CPR) is a life-saving intervention used during cardiac arrest and other life-threatening emergencies. Although medical students may acquire theoretical knowledge of CPR during their training, opportunities to participate in actual resuscitation events may be limited. **Objective:** This study assessed reported CPR performance, identified perceived barriers to its practice, and examined associations between sociodemographic characteristics and CPR-related outcomes among medical students at Enugu State University of Science and Technology College of Medicine (ESUCOM), Nigeria. **Methods:** A cross-sectional analytical study was conducted among 213 medical students selected through a multistage sampling technique. Data were collected using a structured, self-administered questionnaire covering sociodemographic characteristics, CPR knowledge, attitudes, practice, and factors affecting CPR performance. Data were analysed using the Statistical Package for the Social Sciences (SPSS), version 27, and Microsoft Excel. Descriptive statistics and tests of association were used, with statistical significance set at $p < 0.05$. Fisher's exact test was used where appropriate. **Results:** Only 20 respondents (9.4%) reported having performed CPR on a patient during a cardiac emergency, while 193 (90.6%) had never done so. Based on the study's questionnaire scoring system, 188 respondents (88.26%) were classified as having good CPR practice scores, while 25 (11.74%) had poor scores. The most frequently reported barriers were lack of basic training (93.4%), poor exposure (92.0%), inadequate information (91.1%), fear of causing further harm (87.3%), and lack of confidence (85.9%). Previous CPR performance was reported to be significantly associated with age ($p = 0.005$), gender ($p = 0.009$), and level of study (reported as $p < 0.001$). No statistically significant associations were reported between sociodemographic characteristics and categorised CPR practice scores. **Conclusion:** Previous experience performing CPR on patients was uncommon among the surveyed medical students. Participants frequently reported barriers related to training, exposure, information, and confidence. Structured practical training, supervised clinical learning opportunities, and objective assessment of CPR skills may help address the identified educational needs.

Keywords: Cardiopulmonary resuscitation; CPR performance; medical students; perceived barriers; clinical exposure; practical training; Nigeria.

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INTRODUCTION

Cardiopulmonary resuscitation (CPR) is a life-saving intervention used during cardiac arrest and other emergencies involving the loss of effective circulation and breathing. Prompt recognition and appropriate resuscitation are important components of emergency care. Medical students are future healthcare professionals who may encounter patients requiring CPR during clinical training and subsequent professional practice.

Resuscitation education is an important component of undergraduate medical training. International resuscitation guidance emphasises the importance of resuscitation training and the integration of basic life support into healthcare education [1,2]. In addition to theoretical understanding, students require opportunities to practice essential resuscitation procedures and develop the confidence needed to respond appropriately during emergencies.

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However, theoretical knowledge does not necessarily translate into practical experience. Students may understand CPR principles but have limited opportunities to participate in actual resuscitation events. Practical participation may also be affected by inadequate training, limited clinical exposure, insufficient information, lack of confidence, and concerns about causing harm to patients.

Evidence from Nigeria indicates that limited practical experience remains a concern among medical students. A study involving clinical undergraduate students in selected medical colleges in Southern Nigeria reported that 86.1% of respondents had never performed CPR [3]. Such findings highlight the importance of examining not only CPR-related knowledge but also practical experience and perceived barriers that may influence students' participation in resuscitation.

Understanding factors associated with CPR performance can help medical educators identify areas where additional training and supervised practice may be needed. Sociodemographic characteristics may also be relevant when examining differences in reported experience across student groups. Nevertheless, associations between demographic characteristics and previous CPR experience should be distinguished from associations with questionnaire-based practice scores, because these outcomes measure different aspects of CPR-related practice.

At Enugu State University of Science and Technology College of Medicine (ESUCOM), assessing reported CPR performance and perceived barriers among medical students can provide institution-specific evidence to inform training and curriculum planning. Identifying these barriers may support the development of practical learning opportunities that complement classroom instruction.

This study therefore assessed reported CPR performance, identified perceived barriers to CPR practice, and examined associations between sociodemographic characteristics and CPR-related outcomes among medical students at ESUCOM, Nigeria.

Aim of the Study

To assess reported CPR performance and associated factors among medical students at Enugu State University of Science and Technology College of Medicine, Nigeria.

Specific Objectives

1. To determine the proportion of medical students who had previously performed CPR on a patient during a cardiac emergency.
2. To identify perceived barriers affecting CPR practice among medical students.
3. To examine the association between sociodemographic characteristics and previous performance of CPR.
4. To examine the association between sociodemographic characteristics and categorised CPR practice scores.

MATERIALS AND METHODS

Study Area

The study was conducted at Enugu State University of Science and Technology College of Medicine (ESUCOM), located at Park Avenue, Government Reserved Area, Enugu North Local Government Area, Enugu State, Nigeria. The college offers a six-year Bachelor of Medicine and Bachelor of Surgery (MBBS) programme.

Study Design

A cross-sectional analytical study design was employed to assess reported CPR performance, identify perceived barriers to CPR practice, and examine associations between sociodemographic characteristics and CPR-related outcomes among medical students.

Study Population

The study population comprised medical students from the 200 level to the 600 level at ESUCOM. Students in the 100 level were not included because they had not yet entered the College of Medicine and remained at the university's main campus.

Inclusion and Exclusion Criteria

The study included medical students who were present during data collection and agreed to participate. Students who were absent during data collection or too ill to participate were excluded.

Sample Size

A total of 213 medical students participated in the study. The original study reported a total population of 545 students and used Cochran's formula for sample-size determination, with a 95% confidence level, an estimated proportion of 0.704, and a margin of error of 0.05.

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Sampling Technique

A multistage sampling technique was used. First, the student population was categorised according to academic level. Second, proportional allocation was applied to determine the number of participants selected from each level. Third, simple random sampling by balloting was used to select participants.

Table 1. Distribution of participants by academic level (n = 213)

Academic level	Number of participants	Percentage (%)
200 level	72	33.8
400 level B	37	17.4
400 level A	31	14.6
500 level	40	18.8
600 level	33	15.5
Total	**213**	**100.0***

Note: Percentages are reproduced from the original study and may vary slightly from 100% because of rounding.

Study Instrument

Data were collected using a structured, self-administered questionnaire adapted and modified from previously used instruments. The questionnaire contained five sections:

- Section A: Sociodemographic characteristics.
- Section B: Knowledge of CPR.
- Section C: Attitudes towards CPR.
- Section D: CPR practice.
- Section E: Factors affecting CPR practice.

For this paper, the analysis focused on reported CPR practice, perceived barriers, and sociodemographic variables used to examine associations with CPR-related outcomes.

Data Collection

Data were collected by members of the project group over a period of four to six weeks. Questionnaires were administered in classrooms after lectures or practical sessions, with assistance from class representatives. The study protocol was explained to participants, and informed consent was obtained before questionnaire completion.

Measurement of Variables

CPR Practice

The original study used ten practice-related variables to assess CPR practice. Each response was assigned a score of 1 for a positive response and 0 for a negative response, producing a possible total score of 0–10. Scores of 0–4 were classified as poor practice, while scores of 5–10 were classified as good practice.

Previous experience performing CPR on a patient during a cardiac emergency was examined separately. Having previously performed CPR and obtaining a good questionnaire-based practice score were treated as different outcomes.

Perceived Barriers to CPR Practice

Participants were asked about factors affecting their ability or willingness to perform CPR. The barriers reported in the original study included lack of basic training, inadequate information, poor exposure, lack of confidence, lack of opportunities, fear of disease transmission, and fear of causing further harm to a patient. Responses were summarised using frequencies and percentages.

Sociodemographic Characteristics

The sociodemographic variables examined included age, gender, marital status, ethnicity, religion, and academic level. These variables were used to investigate their associations with previous CPR performance and categorised CPR practice scores.

Statistical Analysis

Data were entered and analysed using the Statistical Package for the Social Sciences (SPSS), version 27, and Microsoft Excel. Frequency distributions were checked during data cleaning. Results were summarised using frequencies, percentages, and tables.

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Chi-square analyses were used to examine associations between sociodemographic characteristics and CPR-related outcomes. Fisher's exact test was used where sparse cell frequencies made it appropriate. A p-value below 0.05 was considered statistically significant.

Ethical Considerations

The original study reports that ethical approval was obtained from the Health Research and Ethics Committee of Enugu State University Teaching Hospital, Parklane, Enugu. Participation was voluntary, and informed consent was obtained before questionnaire completion. Confidentiality and anonymity were maintained. Direct identifying information was not collected, and the study reports that data were stored in password-protected digital files accessible to the researchers and supervisor.

RESULTS

Previous Experience Performing Cardiopulmonary Resuscitation

A total of 213 medical students participated in the study. Only 20 respondents (9.4%) reported having performed CPR on a patient during a cardiac emergency, while 193 respondents (90.6%) reported that they had never performed CPR on a patient.

Table 2. Previous experience performing CPR among medical students (n = 213)

Previous CPR experience	Frequency (n)	Percentage (%)
Yes	20	9.4
No	193	90.6
Total	**213**	**100.0**

These findings indicate that previous reported experience performing CPR on patients was uncommon among the respondents.

Reported CPR-Related Practices

Respondents were also asked about specific actions associated with CPR procedures. Their responses are presented in Table 3.

Table 3. Reported CPR-related practices among medical students (n = 213)

Practice-related item	Yes, n (%)	No, n (%)
Call for help before commencing CPR	171 (80.3)	42 (19.7)
Check pulse before CPR	192 (90.1)	21 (9.9)
Ensure patient is supine on a hard surface	202 (94.8)	11 (5.2)
Wear latex gloves	49 (23.0)	164 (77.0)
Use both hands for chest compressions	208 (97.7)	5 (2.3)
Pinch nostrils before mouth-to-mouth ventilation	188 (88.3)	25 (11.7)
Observe chest rise and fall during ventilation	203 (95.3)	10 (4.7)
Perform CPR on a patient in a hospital environment	82 (38.5)	131 (61.5)
Place palms on forehead and gently tilt head forward	152 (71.4)	61 (28.6)

Source: Original study questionnaire results. Item wording and response categories are retained from the original study.

The responses varied across the individual practice-related items. Many respondents reported particular procedural actions, including using both hands for chest compressions (97.7%), ensuring that the patient was supine on a hard surface (94.8%), and observing chest rise and fall during ventilation (95.3%). However, only 9.4% reported having previously performed CPR on a patient during a cardiac emergency.

These questionnaire responses should not be interpreted as an objective assessment of clinical competence.

Categorised CPR Practice Scores

Based on the original study's questionnaire scoring system, 88.26% of respondents were classified as having good CPR practice scores, while 11.74% were classified as having poor scores.

Table 4. Categorised CPR practice scores among medical students (n = 213)

CPR practice category	Frequency (n)	Percentage (%)
Good practice score	188	88.26
Poor practice score	25	11.74
Total	**213**	**100.00**

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Note: Frequencies are obtained by summing the corresponding categories reported in the original sociodemographic association table. The score categories follow the original study's classification.

The difference between the proportion classified as having good practice scores and the proportion who had previously performed CPR on a patient is important. The practice score reflects questionnaire-based responses, whereas previous performance represents reported experience in a patient-care setting. The two outcomes should therefore remain separate in interpretation.

Perceived Barriers to CPR Practice

Respondents identified several factors that they perceived as barriers to performing CPR. Lack of basic training was the most frequently reported barrier, followed by poor exposure and inadequate information.

Table 5. Reported barriers affecting CPR practice (n = 213)

Reported barrier	Frequency (n)	Percentage (%)
Lack of basic CPR training	199	93.4
Lack of adequate information	194	91.1
Poor exposure to CPR	196	92.0
Lack of confidence	183	85.9
Lack of opportunities to perform CPR	160	75.1
Fear of disease transmission	102	47.9
Fear of causing further harm to the patient	186	87.3

Source: Original study barriers table.

The most frequently reported barriers were lack of basic CPR training (93.4%), poor exposure (92.0%), and inadequate information (91.1%). Fear of causing further harm was reported by 87.3% of respondents, while 85.9% reported lack of confidence. Lack of opportunities to perform CPR was reported by 75.1%, and 47.9% identified fear of disease transmission.

These findings show that respondents identified multiple barriers rather than a single obstacle to CPR practice. The results describe participants' reported perceptions and do not, by themselves, establish the independent causal effect of each barrier.

Association Between Sociodemographic Characteristics and Previous CPR Performance

The study examined whether age, gender, marital status, ethnicity, religion, and level of study were associated with respondents' reports of having previously performed CPR on a patient during a cardiac emergency.

Table 6. Association between sociodemographic characteristics and previous CPR performance (n = 213)

Variable	Category	Ever performed CPR, n (%)	Never performed CPR, n (%)	p-value
Age (years)				**0.005***
	Below 20	2 (2.2)	91 (97.8)	
	20–25	16 (15.5)	87 (84.5)	
	26–30	2 (12.5)	14 (87.5)	
	Above 30	0 (0.0)	1 (100.0)	
Gender				**0.009***
	Male	16 (14.5)	94 (85.5)	
	Female	4 (3.9)	99 (96.1)	
Marital status				1.000
	Single	20 (9.5)	191 (90.5)	
	Married	0 (0.0)	1 (100.0)	
	Widowed	0 (0.0)	1 (100.0)	
Ethnicity				1.000
	Igbo	20 (9.7)	187 (90.3)	
	Yoruba	0 (0.0)	1 (100.0)	
	Others	0 (0.0)	5 (100.0)	
Religion				1.000
	Christian	20 (9.6)	189 (90.4)	

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	African Traditional Religion	0 (0.0)	2 (100.0)	
	Others	0 (0.0)	2 (100.0)	
Level of study				**<0.001***
	200 level	2 (2.8)	70 (97.2)	
	400 level B	0 (0.0)	37 (100.0)	
	400 level A	0 (0.0)	31 (100.0)	
	500 level	10 (25.0)	30 (75.0)	
	600 level	8 (24.2)	25 (75.8)	

Statistically significant at $p < 0.05$. The source table reports the age p-value as 0.005, while the original narrative reports 0.006. The value shown here follows the source table and requires confirmation against the original statistical output.

The analysis indicated statistically significant associations between previous CPR performance and age, gender, and level of study. Respondents aged 20–25 years reported previous CPR performance at a proportion of 15.5%, compared with 2.2% among respondents younger than 20 years and 12.5% among those aged 26–30 years.

Previous CPR performance was reported by 14.5% of male respondents and 3.9% of female respondents. Differences were also observed across academic levels: 25.0% of 500-level students and 24.2% of 600-level students reported previous CPR performance, compared with 2.8% of 200-level students and none of the respondents in the two 400-level groups.

No statistically significant associations were reported for marital status, ethnicity, or religion. However, the very small numbers of respondents in some categories mean that these comparisons should be interpreted cautiously.

Association Between Sociodemographic Characteristics and Categorised CPR Practice Scores

A separate analysis examined whether sociodemographic characteristics were associated with the questionnaire-based classification of good or poor CPR practice.

Table 7. Association between sociodemographic characteristics and categorised CPR practice scores (n = 213)

Variable	Category	Good practice, n (%)	Poor practice, n (%)	p-value
Age (years)				0.801
	Below 20	80 (86.0)	13 (14.0)	
	20–25	93 (90.3)	10 (9.7)	
	26–30	14 (87.5)	2 (12.5)	
	Above 30	1 (100.0)	0 (0.0)	
Gender				0.970
	Male	97 (88.2)	13 (11.8)	
	Female	91 (88.3)	12 (11.7)	
Marital status				0.874
	Single	186 (88.2)	25 (11.8)	
	Married	1 (100.0)	0 (0.0)	
	Widowed	1 (100.0)	0 (0.0)	
Ethnicity				0.792
	Igbo	183 (88.4)	24 (11.6)	
	Yoruba	1 (100.0)	0 (0.0)	
	Others	4 (80.0)	1 (20.0)	
Religion				0.763
	Christian	184 (88.0)	25 (12.0)	
	African Traditional Religion	2 (100.0)	0 (0.0)	
	Others	2 (100.0)	0 (0.0)	
Level of study				0.592
	200 level	62 (86.1)	10 (13.9)	
	400 level B	31 (83.8)	6 (16.2)	
	400 level A	27 (87.1)	4 (12.9)	
	500 level	37 (92.5)	3 (7.5)	
	600 level	31 (93.9)	2 (6.1)	

Statistical significance threshold: $p < 0.05$.

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No statistically significant association was reported between categorised CPR practice scores and age (p = 0.801), gender (p = 0.970), marital status (p = 0.874), ethnicity (p = 0.792), religion (p = 0.763), or level of study (p = 0.592).

Although good practice scores were numerically more frequent in some groups, the differences were not statistically significant in the source analysis.

The findings from the two association analyses should be interpreted separately. Age, gender, and academic level were associated with whether respondents reported ever having performed CPR on a patient. By contrast, none of the sociodemographic characteristics examined was significantly associated with the categorised questionnaire-based practice score.

These findings are not necessarily contradictory because previous experience and a questionnaire-derived practice category are different measures. The study did not establish that demographic characteristics caused differences in CPR performance, nor did it objectively assess CPR skills using a practical examination.

DISCUSSION

Previous Experience Performing CPR

This study found that only 9.4% of respondents had previously performed CPR on a patient during a cardiac emergency, while 90.6% reported no such experience. This finding indicates limited reported exposure to real-life resuscitation among the surveyed medical students.

The finding is consistent with the concern that theoretical familiarity with CPR may not translate into opportunities to participate in actual emergencies. Fawole *et al*. [3], in a study involving clinical undergraduate students in selected medical colleges in Southern Nigeria, similarly reported that 86.1% of respondents had never performed CPR. Aliyu *et al*. [4] also examined CPR knowledge and practice among clinical students in a Nigerian medical school, highlighting the relevance of practical experience in medical education.

The low proportion of respondents reporting previous CPR performance should not automatically be interpreted as evidence that all other students lack the ability to perform CPR. The study measured reported previous experience rather than objectively assessed resuscitation competence. Nevertheless, the finding identifies limited reported patient-related experience as an important issue for further investigation.

Reported CPR Practice Scores and Previous Experience

Although only 9.4% of respondents reported previous CPR performance on a patient, 88.26% were classified as having good CPR practice scores under the study questionnaire's scoring system. These results measure different aspects of CPR-related practice and should not be treated as interchangeable.

A favourable questionnaire score may reflect respondents' answers to questions about CPR procedures, but it does not establish that they can perform those procedures correctly in a real emergency. Practical competence requires assessment of performance, and the study did not report an objective practical examination.

This distinction is important when interpreting the findings. The high proportion of good questionnaire-based scores should not obscure the low reported prevalence of previous CPR performance. Future studies could compare questionnaire scores with observed performance during structured simulation assessments.

Perceived Barriers to CPR Performance

Lack of basic CPR training was the most frequently reported barrier, identified by 93.4% of respondents. Poor exposure to CPR was reported by 92.0%, while 91.1% reported a lack of adequate information. These findings suggest that respondents perceived limitations in training, exposure, and access to information as major obstacles to CPR practice.

The findings support consideration of practical CPR instruction alongside theoretical teaching. International resuscitation guidance emphasises the importance of resuscitation education for individuals who may be required to respond to cardiac arrest [2]. Simulation-based training may provide opportunities to practise procedures, receive feedback, and develop familiarity with emergency-response sequences in a controlled setting.

Fear of causing further harm was reported by 87.3% of respondents, while 85.9% identified lack of confidence as a barrier. These findings indicate that practical preparation may need to address not only procedural steps but also students' concerns about intervening during emergencies. Alrashidi *et al*. [5] reviewed the use of simulation to improve student nurses' self-confidence in clinical practice, providing relevant educational context for considering simulation-based learning.

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Fear of disease transmission was reported by 47.9% of respondents. Although this proportion was lower than that reported for several other barriers, infection-prevention concerns remain relevant to resuscitation education. Training can include appropriate instruction on available protective measures and safe emergency procedures.

Lack of opportunities to perform CPR was reported by 75.1% of respondents in the original barriers table. This finding further supports the need to consider supervised practice and simulation opportunities as part of undergraduate medical education. However, because the study was cross-sectional and based on self-reported questionnaire responses, the results identify perceived barriers rather than proving that any one barrier caused limited CPR performance.

Sociodemographic Characteristics and Previous CPR Performance

The source analysis reported statistically significant associations between previous CPR performance and age, gender, and academic level. Respondents aged 20–25 years reported a higher proportion of previous CPR performance than those younger than 20 years. Male respondents also reported previous CPR performance more frequently than female respondents.

Differences were observed across academic levels. Respondents in the 500 and 600 levels reported previous CPR performance at proportions of 25.0% and 24.2%, respectively. The proportion was lower among 200-level students, and no previous performance was reported in the two 400-level groups.

One possible interpretation is that students at more advanced stages of medical education may have had greater opportunities for clinical exposure. However, the study did not directly measure the amount or nature of each participant's clinical exposure. Therefore, academic level should not be assumed to have caused the observed differences.

The gender and age associations also require cautious interpretation. The study design does not establish causal relationships, and the results may be influenced by factors not measured in the analysis. Further research with larger samples and clearly defined measures of training and clinical exposure would be useful to examine these associations.

No statistically significant associations were reported between previous CPR performance and marital status, ethnicity, or religion. The small numbers of respondents in several categories limit the strength of conclusions that can be drawn from these comparisons.

Sociodemographic Characteristics and Categorised Practice Scores

In the separate analysis of categorised CPR practice scores, no statistically significant association was reported with age, gender, marital status, ethnicity, religion, or academic level. For example, the reported proportions with good practice scores were similar among male and female respondents.

The difference between these results and the associations observed for previous CPR performance reinforces the need to distinguish the two outcomes. A questionnaire-derived practice score does not necessarily represent actual experience performing CPR on a patient. The findings also suggest that demographic characteristics alone may not adequately describe the factors relevant to CPR preparedness.

Because the analysis included categories with very small numbers of participants, statistical estimates should be interpreted cautiously. The original statistical output should be reviewed to confirm the exact test used and the reported p-values before publication.

Implications for Medical Education

The findings have practical implications for CPR education at the institution studied. The high frequency of reported barriers, particularly lack of training, poor exposure, inadequate information, and lack of confidence, supports reviewing the opportunities available for practical resuscitation learning.

Possible educational approaches include structured CPR training, simulation exercises, supervised demonstrations, and periodic practical assessments. Refresher sessions may also be considered to reinforce procedural understanding. These approaches are recommendations arising from the findings and relevant educational literature; their effectiveness was not tested by the present study.

Future evaluations should distinguish between students' self-reported knowledge of CPR procedures, previous patient-related experience, and objectively demonstrated competence. This would provide a clearer basis for determining whether educational interventions improve practical performance.

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Limitations

Several limitations should be considered when interpreting the findings.

First, the study was conducted at a single medical college, which limits the generalisability of the results to medical students in other institutions or regions of Nigeria.

Second, CPR practice and previous experience were assessed through self-reported questionnaire responses rather than direct observation of performance. Responses may therefore be affected by recall or social-desirability bias.

Third, the cross-sectional design identifies associations but does not establish causality. The observed relationships between previous CPR performance and age, gender, or academic level should not be interpreted as evidence that these characteristics caused the differences.

Fourth, the study did not report an objective practical skills assessment. Consequently, the categorised CPR practice score cannot be treated as proof of demonstrated clinical competence.

Finally, some values in the original manuscript require verification. The reported age-association p-value differs between the table and narrative, and the reported percentage for lack of opportunities is inconsistent between the table and discussion. These discrepancies should be checked against the original statistical output and source tables before submission.

CONCLUSION

This study assessed reported CPR practice, perceived barriers, and associated sociodemographic characteristics among 213 medical students at Enugu State University of Science and Technology College of Medicine, Nigeria.

Only 9.4% of respondents reported having previously performed CPR on a patient during a cardiac emergency, while 90.6% reported no such experience. Although 88.26% were classified as having good questionnaire-based CPR practice scores, these scores should not be interpreted as proof of practical competence.

The most frequently reported barriers were lack of basic CPR training, poor exposure, inadequate information, fear of causing further harm, and lack of confidence. Previous CPR performance was reported to be significantly associated with age, gender, and academic level, whereas categorised CPR practice scores were not significantly associated with the sociodemographic characteristics examined.

The findings support strengthening practical CPR education, providing supervised learning opportunities, and assessing resuscitation skills through appropriate practical methods.

Recommendations

Based on the findings, the following recommendations are proposed:

1. **Integrate regular CPR training into the medical curriculum.** Practical instruction should complement theoretical teaching.
2. **Expand simulation-based learning.** Students should have opportunities to practise CPR in simulated emergencies under appropriate supervision.
3. **Strengthen supervised clinical exposure.** Where appropriate, students should be given opportunities to observe and participate in resuscitation activities during clinical training.
4. **Address perceived barriers.** Training should address lack of confidence, fear of causing harm, infection-prevention concerns, and uncertainty about emergency procedures.
5. **Introduce practical skills assessments.** CPR competence should be evaluated through structured practical demonstrations or simulation assessments rather than relying exclusively on questionnaire responses.
6. **Consider regular refresher training.** Refresher sessions may help reinforce CPR procedures and provide opportunities for continued practice.

Conduct further research. Studies in other medical schools should examine whether questionnaire-based practice scores correspond with objectively assessed CPR performance and investigate the relationship between clinical exposure, training, and previous experience.

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