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# Knowledge and Practice of Basic Life Support Among Clinical Students in Ambrose Alli University, Ekpoma, Nigeria

***Alenoghena Innocent Osi[1], Akhideno Irene Irenosen[2], Aramunde Courage[1], Azhimi Vannessa[1]***

*[1]Department of Community Health, Ambrose Alli University, Ekpoma, Edo State.*
*[2]Department of Anaesthesiology-Surgery, Ambrose Alli University, Ekpoma, Edo State*

**Corresponding author: Innocent Alenoghena,** Department of Community Health, Ambrose Alli University, Ekpoma, Edo State, Nigeria, alendoc@yahoo.com:+2348035605691

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## ABSTRACT

**Background:** Basic life support (BLS) is a level of medical care used for patients with life-threatening conditions, such as cardiac arrest, until advanced medical care providers can provide full medical care.
**Objective:** This study aimed to assess the knowledge of BLS, the attitude of respondents towards BLS, and to evaluate the practices of BLS among Clinical students of AAU, Ekpoma.
**Method:** A cross-sectional study was conducted among 420 medical students using a structured questionnaire. Data was analysed using IBM SPSS version 22.0.
**Results: A** total of 420 respondents were interviewed in this study. Four hundred and ten (97.6%) were aware of CPR/BLS. Two hundred and ninety-four (70%) had a good knowledge of the principles of CPR/BLS. Three hundred and ninety-one (93.1%) received a lecture of CPR/BLS, 300 (71.4%) received a hands-on simulation of CPR/BLS; only 38.6% knew the proper compressions to rescue breath to administer. Factors associated with good knowledge included: age (p=0.001), with the older respondents more knowledgeable; sex (p=0.0001), with males having better knowledge; level of study (p=0.001), progressively better in the higher levels and religion (p=0.003), which was better with Christianity. All respondents who were aware of CPR/BLS (100%) had a positive attitude towards CPR/BLS.
**Conclusion**: Knowledge of CPR/BLS was associated with age, gender, level of study and religion. The medical curriculum of students in Nigeria should be enriched with more practical sessions and drills on CPR/BLS.

**Keywords:** Ambrose Alli University, Basic life support, Cardiopulmonary respiration.



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## INTRODUCTION

Basic life support (BLS) is a level of medical care used for patients with life-threatening conditions, such as cardiac arrest, until advanced medical care providers can provide full medical care.[1] Lay bystanders and trained medical personnel can provide it. BLS is a sequence of interventions used in emergencies to sustain life in individuals experiencing cardiac or respiratory arrest. It involves a series of steps that prioritize maintaining blood circulation and oxygenation until advanced medical assistance can take over.[2] Cardiac arrest can occur anytime and anywhere. The lack of training and competence to deal with these emergencies can lead to tragic consequences. Sudden cardiac arrest is the major cause of death worldwide, with a large variation in survival rates between countries.[3] Cardiac arrest could occur from Electrolyte imbalance, hypovolaemia (severe blood loss or shock), drug overdose, trauma, respiratory issues and even some comorbid conditions such as diabetes, chronic kidney disease, etc, many of which can lead to emergencies requiring Basic Life Support (BLS).[2] Prompt institutions of BLS can maintain blood flow during such events, especially when performing any cardiopulmonary resuscitation (CPR), which is associated with a double the survival rate compared with no CPR in a nationwide study conducted in Sweden.[4] Early detection of cardiac arrest and initiation of CPR have been shown to decrease mortality and morbidity.
Basic Life Support (BLS) has evolved significantly over the years, reflecting advancements in medical understanding and emergency response protocols. The modern practice of BLS began taking shape in the mid-20th century. In the 1960s, researchers like Dr. Peter Safar contributed to the development of standardized resuscitation techniques, leading to the introduction of the "ABC" approach (Airway, Breathing, and Circulation).[5, 6]

In 1963, the American Heart Association (AHA) held the first CPR course for laypersons, marking a significant step in public health education. The AHA first introduced the "C" in the ABCs as "Circulation", reflecting this change. The "CAB" sequence (Compressions, Airway, Breathing) was formally adopted in the 2010 guidelines, underscoring the priority of early chest compressions.[7]

Statistics underscore the urgent need for BLS training and prompt intervention. According to the AHA, approximately 350,000 out-of-hospital cardiac arrests occur each year in the United States, with a survival rate of around 10%.[4] However, when bystanders perform CPR, survival rates can double or triple, emphasizing the importance of immediate action.[8] Studies have shown that CPR provided by a bystander can significantly improve the chances of survival, especially when combined with the use of an Automated External Defibrillator (AED).[3]

Research indicates that for every minute that passes without CPR and defibrillation, the chance of survival decreases by 7-10%.[4] This statistic underscores the significance of BLS in emergenciess. The availability and use of AEDs have also become a crucial part of BLS training, as these devices can restore normal heart rhythm and are designed for use by laypersons. In recent years, organizations like the AHA and the European Resuscitation Council (ERC) have continued to update their guidelines based on ongoing research. This includes the latest emphasis on hands-on CPR for untrained bystanders, which focuses on high-quality chest compressions without rescue breaths, as studies show that this approach can be effective and encourages more people to intervene.

In Nigeria, the statistics surrounding cardiac emergencies and Basic Life Support (BLS) reflect significant public health challenges. Cardiovascular diseases (CVDs) are among the leading causes of morbidity and mortality in the country. Cardiovascular diseases account for approximately 11% of total deaths in Nigeria, according to the World Health Organization.[9] The incidence of out-of-hospital cardiac arrests in Nigeria is estimated to be around 100 to 200 cases per 100,000 people annually, similar to trends observed in other parts of Africa.[7] However, the survival rates for out-of-hospital cardiac arrest are notably low, with estimates ranging from 1% to 5%. This is significantly lower than survival rates in higher-income countries, highlighting the need for improved training and immediate response interventions. Bystander CPR rates in Nigeria are also concerning, with studies indicating that bystander CPR is performed in only about 10% of cases. Increasing this rate is critical, as timely intervention can greatly enhance the chances of survival.[2, 10]

In Nigeria, the attitude towards BLS is often hindered by inadequate knowledge, limited access to training and



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lack of awareness, even among healthcare practitioners.[11] A study conducted in a Nigerian teaching hospital showed that among final-year study students, before receiving focused BLS training, only 8.2% had good knowledge of CPR[8]. This indicates that when learning about certain parameters of BLS, we must possess adequate knowledge about them. Another study conducted at the University of Ibadan highlighted that only 28.5% of students and staff were aware of BLS techniques, demonstrating limited public knowledge about these life-saving skills[9]. There are limited training opportunities; many Nigerians, including healthcare workers, lack formal training in BLS. A study conducted shows that 75% of health workers had not received Basic Life Support (BLS) training. This shows the significant knowledge gap even among first-time responders, limiting their ability to handle cardiac emergencies effectively.[12,13]

There is a critical need for life-saving skills as there is an increasing incidence of cardiac emergencies and other life-threatening situations, highlighting the importance of equipping individuals, especially students, with BLS skills. Although there is a lack of data to show the level of inadequacy in BLS/CPR preparedness in Nigeria, many individuals, including students and staff, lack basic knowledge of the techniques, which can lead to unnecessary failures in emergencies.[14] This study aimed to determine the knowledge, attitudes, and practices of basic life support among clinical students in AAU, Ekpoma.

## METHODOLOGY

This cross-sectional descriptive study was conducted at Ambrose Alli University (AAU), Ekpoma, Edo State. This University was established in 1981 and was first known as Bendel State University (BENSU), Ekpoma. The university is situated in Ekpoma town, which serves as the administrative headquarters of Esan West Local Government Area. Ekpoma lies on the geographical coordinate of latitude $6^{0}45'$N $6^{0}08'$E. Ambrose Alli University (AAU) has two campuses: the main campus and the College of Medicine. The College of Medicine collaborates with Irrua Specialist Teaching Hospital (ISTH), where clinical studies are conducted and clinical postings are made. In addition, ISTH is situated on the Ishan plateau, some 87 kilometres north of Benin City.[15]
This study was carried out among clinical students of AAU from May 2024 to December 2024. The clinical students included those in the 400-, 500-, and 600-level courses (which was referred to as 500-Level B).
Clinical students were selected from the three levels that make up the clinical programme. The population of students in various levels was 500L = 212 students;600L = 210 students; total = 422. It was a total population study.

The survey was carried out using a structured interviewer-administered questionnaire. The questionnaire was divided into four sections: the social demographic section, which included age, gender, ethnic group, marital status, and religion; the section on knowledge of basic life support; the section on attitude toward basic life support; and the section on Practices toward Basic Life Support. Pretesting was carried out with 10% of selected students from the population. Before data collection, these questionnaires were further validated and reliability tested by residents in the department of Community Medicine, Irrua Specialist Teaching Hospital, Irrua, Edo State.

Data was screened for completeness, coded, and entered into IBM SPSS version 22.0. Univariate analysis was done to assess the distribution of the variables. Bivariate analysis was done to determine the association between respondents' socio-demographic characteristics and their overall knowledge and overall practice of BLS using the chi-square test and Fisher's exact test. A p-value of less than 0.05 was considered statistically significant.

Respondents' knowledge of CPR/BLS was assessed using four (4) questions, with some having multiple responses. A correct response was awarded a score of one (1) while an incorrect response was awarded a score of zero (0), with a maximum obtainable score of 9. The total score for each respondent was converted to a percentage and classified into three categories: Poor knowledge (less than 50%); Fair knowledge (50-69.9%); and good knowledge (70% and above).
Ethical approval was obtained from the Irrua Specialist Teaching Hospital Research and Ethics Committee (ISTH/HREC/20251801545). Before data were collected, informed consent was obtained from the respondents. All data were kept secure and available only to members of the research team.



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## RESULTS

A total of four hundred and twenty (420) questionnaires were returned within the study period, giving a response rate of 99.5% response rate. The mean age of the respondents was 24.8 years and a standard deviation (SD) of 4.5.

As shown in table 1, males constituted 57.8% of the respondents. Majority of the participants were Christians, 360 (85.7%), while the rest were Muslim, 60 (14.3%). An equal number of respondents were selected from 600L and 500L students.

Table 2 shows the information on the study participants' knowledge of life support. A good majority, 391 (93.1%), had a lecture on CPR and BLS, with a greater proportion, 360 (85.7%), having received the lecture a year ago. Three hundred respondents (71.4%) had a hands-on simulation of CPR/BLS. A higher proportion of the respondents, 270 (64.2%), know the first step for CPR; however, only 162 (38.6%) know the correct compressions and rescue breaths to administer. Almost all participants, 391 (93.1%) were aware that CPR is stopped when the patient regains consciousness.

Figure 1 shows that the majority of the respondents, 294 (70%), had a good knowledge of CPR/BLS. In total, 410 responses were analyzed. Thirty percent had poor knowledge of CPR/BLS rudiments. None of the respondents had a fair knowledge of CPR/BLS.

Table 3 shows a statistically significant association between socio-demographic data and knowledge of life support. This included age ($p = 0.001$); with older respondents being more knowledgeable; sex ($p = 0.0001$); with males having better knowledge; level of study ($p = 0.001$), which improved progressively with higher levels; and religion ($p = 0.003$), with Christianity being associated with better knowledge.

The respondents' attitudes towards basic life support are presented in Table 4. All the respondents (who were aware of CPR/BLS) believe that everyone should be trained in BLS. A greater proportion of the respondents, 210 (51.2%), do not feel well equipped to carry out BLS if faced with a patient with cardiac arrest. Among respondents who feel less equipped, 181 (86.2%) reported difficulty with hands-on tasks. All the respondents recommended that BLS should be mandatory for medical students.

The practice of basic life support data is demonstrated in Table 5. Only 234 (57.1%) of respondents had practiced CPR in real life, 264 (64.4%) had seen a patient with cardiac arrest and 174 (42%) of respondents had carried out CPR on them. Two sixty-four percent of the participants (64.0%) had taught someone.

**Table 1: Socio-Demographic Characteristics of Respondents**

| Variable | Frequency (N=420) | Percentage |
|---|---|---|
| **Age** | | |
| 16-20 | 60 | 14.3 |
| 21-25 | 210 | 50 |
| 26-30 | 89 | 21.2 |
| 31-35 | 61 | 14.5 |
| Mean $\pm$ SD = 24.8 $\pm$ 4.5 | | |
| **Sex** | | |
| Male | 242 | 57.8 |
| Female | 178 | 42.4 |
| **Ethnicity** | | |
| Essan | 251 | 59.7 |
| Etsako | 56 | 13.3 |
| Bini | 80 | 19.0 |
| others | 33 | 7.8 |
| **Marital status** | | |
| Single | 375 | 89.2 |
| Married | 45 | 10.7 |
| Divorced | 0 | 0 |
| **Occupations** | | |
| Unemployed | 330 | 78.5 |
| Employed | 47 | 10.7 |
| Self Employed | 83 | 19.8 |
| **Level** | | |
| 500L | 210 | 50 |
| 600L | 210 | 50 |
| **Religion** | | |
| Christianity | 360 | 85.7 |
| Islam | 60 | 14.3 |

**Table 2: Awareness and Knowledge of Life Support (N=420)**

| Variable | Frequency | Percentage |
|---|---|---|
| **Heard of CPR/BLS** | | |
| Yes | 410 | 97.6 |
| No | 10 | 2.4 |
| **Had a lecture/training on CPR/BLS** | | |
| Yes | 391 | 93.1 |
| No | 29 | 14.3 |
| **If yes, when** | | |
| 1year ago | 360 | 85.7 |



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| Variable | Frequency | Percentage |
|---|---|---|
| 2years ago | 25 | 5.9 |
| >2years ago | 6 | 1.5 |
| **Have you participated in a hands-on CPR/BLS simulation?** | | |
| Yes | 300 | 71.4 |
| No | 120 | 28.6 |
| **If yes above, when** | | |
| 1year ago | 270 | 64.2 |
| 2years ago | 27 | 6.4 |
| >2years ago | 3 | 0.8 |
| **First Step when encountering an unconscious person** | | |
| Check for breathing | 270 | 64.2 |
| Start Chest Compression | 60 | 14.2 |
| Call emergency services | 61 | 14.5 |
| Shake the person vigorously | 0 | 0 |
| Don't know | 29 | 6.9 |
| **The right compression-to-ventilation in an adult CPR for a single rescuer** | | |
| 15:2 | 200 | 47.6 |
| 30:2 | 162 | 38.6 |
| 20:2 | 29 | 6.9 |
| Continuous compression | 0 | 0 |
| Don't know | 29 | 6.9 |
| **How long should we check for breathing before starting CPR?** | | |
| 2 seconds | 181 | 43.0 |
| 5 seconds | 119 | 28.3 |
| 10 seconds | 100 | 23.8 |
| 18 seconds | 0 | |
| **Can CPR be stopped if a person regains consciousness?** | | |
| Yes | 391 | 93.1 |
| No | 29 | 6.9 |

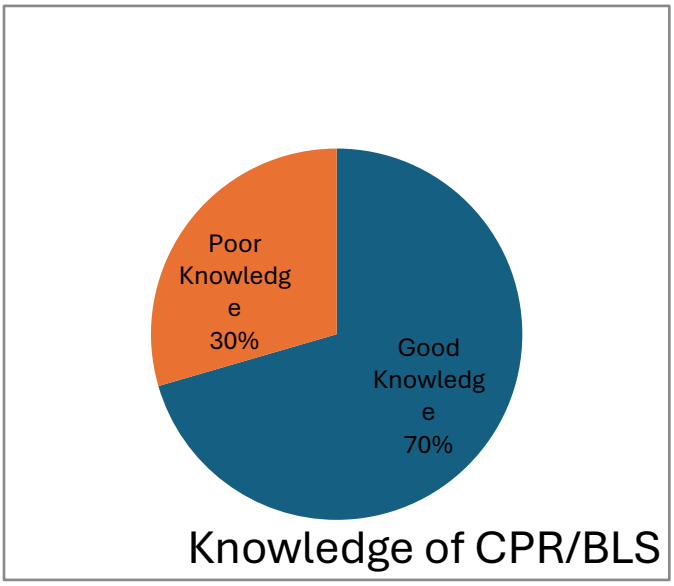


**Figure 1. Knowledge of CPR/BLS (N=420)**

**Table 3: Relationship between Socio-demographic Characteristics and Knowledge of Basic Life Support (N=410)**

| Variable | Had a lecture/training on CPR/BLS Yes (%) | No (%) | Total (%) | df | $X^2$ | p-value |
|---|---|---|---|---|---|---|
| **Age** | | | | | | |
| 16-20 | 58(15.2%) | 0 | 58(14.1%) | | | |
| 21-25 | 206(54.1%) | 0 | 206(50.2%) | 3 | | 0.001** |
| 26-30 | 58(15.2%) | 29 (100.0%) | 87(21.2%) | | | |
| 31-35 | 59(15.5%) | 0 | 59(35.9%) | | | |
| **Sex** | | | | | | |
| Male | 234(61.0%) | 0 | 234(57.1%) | 1 | 87.770 | 0.001* |
| Female | 150 (39.0%) | 26(100.0%) | 176(42.9%) | | | |
| **Level** | | | | | | |
| 500 | 170(45.3%) | 35(100.0%) | 205(50%) | 1 | 75.862 | 0.001* |



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| Variable | Had a lecture/training on CPR/BLS Yes (%) | No (%) | Total (%) | df | $X^2$ | p-value |
|---|---|---|---|---|---|---|
| 600 | 205(54.7%) | 0 | 205(50%) | | | |
| **Religion** | | | | | | |
| Christianity | 323(84.8%) | 28(97.0%) | 348(8415.9%) | 1 | 8.791 | 0.003** |
| Islam | 58(15.2%) | 1 (3.0%) | 62(15.1%) | | | |

*chi-square test; **fisher's exact test

**Table 4: Attitude Towards Basic Life Support**

| Variable | Frequency (N=410) | Percentage |
|---|---|---|
| **Believe everyone should be trained in BLS.** | | |
| Yes | 410 | 100 |
| No | 0 | 0 |
| **Feel well-equipped to carry out BLS if faced with a patient with cardiac arrest afterwards.** | | |
| Yes | 200 | 48.8 |
| No | 210 | 51.2 |
| **If No to the above, why?** | | |
| I don't do hands-on well | 181 | 43.1 |
| I'm not a doctor, so I'm not confident | 29 | 6.9 |
| The hands-on training was rushed | 0 | 0 |
| **BLS training should be mandatory for students** | | |
| Yes | 410 | 100 |
| No | 0 | 0 |

**Table 5: Practice of Basic Life Support**

| Variable | Frequency (N=410) | Percentage |
|---|---|---|
| **Ever practiced CPR in real life in an emergency?** | | |
| Yes | 234 | 57.1 |
| No | 176 | 42.9 |
| **Have you seen a patient who had cardiac arrest?** | | |
| Yes | 264 | 64.4 |
| No | 146 | 35.6 |
| **If yes, did you commence BLS?** | | |
| Yes | 174 | 42.4 |
| No | 234 | 57.6 |
| **Do you feel confident in initiating BLS?** | | |
| Yes | 145 | 35.4 |
| No | 265 | 64.6 |
| **Ever taught someone about BLS or CPR?** | | |
| Yes | 264 | 64.4 |
| No | 146 | 35.6 |
| **If required, will you be able to perform CPR for at least 5 minutes continuously?** | | |
| Yes | 322 | 78.5 |
| No | 88 | 21.5 |



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| Variable | Frequency (N=410) | Percentage |
|---|---|---|
| **How often do you refresh your knowledge or skills in BLS?** | | |
| Regularly (every 6 months to 1 year) | 235 | 57.3 |
| Occasionally (every 2- 3 year) | 58 | 14.1 |
| Rarely/never | 117 | 28.5 |

## DISCUSSION

Over four-fifths of the respondents were aware of CPR/BLS. This was slightly higher than reports from South-Western Nigeria.[10], and Ibadan[2] where 79.2% and 82.5% of the respondents were aware of CPR/BLS, respectively. This finding is not surprising, as all the respondents were medical students who may have inevitably been informed about CPR/BLS as part of their training. Similarly, 4 out of every five respondents received some form of formal training on CPR. This was at variance with a previous report by Adewale et al[2], where 40.8% had received a lecture on BLS. It was also incongruent with another report by researchers in South West Nigeria.[16] and northeastern India, where 51.3% and 52% of the respondents had received any form of training on BLS, respectively. The observed differences between this study and previous ones may be attributed to the levels of undergraduates enrolled in the studies. Whereas this study enrolled only students in the clinical levels, the previous studies assessed students at all levels. Approximately three-quarters of the participants in this study had participated in a hands-on CPR/BLS simulation within the year preceding the survey. This is also in keeping with a previous report by researchers from Northeastern India,[17] where more than half of the respondents had participated in a hands-on simulation of CPR/BLS. This is highly commendable and reveals the respondents' level of exposure to CPR/BLS. Furthermore, two-thirds of the participants of this study know the first step for CPR; however, only a third know the correct compressions to apply during CPR. This was relatively lower than the report of a web-based study,[10] where over half of the respondents knew the correct compression to apply for adults. This reflects some gap in the details of their previous training in CPR/BLS. Correcting this gap is particularly important due to its significance in the overall recovery of the patient during resuscitation.[13] Moreover, almost all participants (93.1%) were aware that CPR is stopped when the patient regains consciousness.

Overall, nearly three-quarters of the respondents in this study demonstrated a good knowledge of CPR/BLS. This was significantly higher than a report from South-South Nigeria,[18] where only 25.4% of the respondents had a good knowledge of CPR.

All in all, common factors that showed statistically significant association with the knowledge of the respondents on CPR/BLS included: age (p=0.001), with the older respondents more knowledgeable; sex (p=0.0001), with males having better knowledge; level of study (p=0.001), progressively better in the higher levels and religion (p=0.003), which was better with Christianity. It can be inferred that the older respondents may be at higher levels, which may account for their better knowledge of CPR/BLS. Indeed, these corroborate earlier reports by Adewole et al,[2]

All the respondents in this study had a positive attitude towards CPR/BLS. This finding is consistent with a previous study conducted in India.[17] and Ibadan[2]; where most of the participants had a positive attitude towards BLS. Also, all the respondents believed that BLS should be made mandatory for students.

Nonetheless, regarding the practice of basic life support, about half of the respondents had actually practiced CPR in real-life situations. This was indeed higher than the findings of Onabanjo et al,[10] where 35.4% of the respondents had ever done CPR. Furthermore, a good majority (64.4%) of the participants had seen a patient with cardiac arrest, but only about a third of them expressed confidence in carrying out CPR on them repeatedly.

### Conclusion/Recommendation

Four-fifths of the respondents were aware of CPR/BLS, but approximately three quarters demonstrated a good understanding. This result was significantly higher than those from previous research in Nigeria.

The knowledge of CPR/BLS was significantly associated with age, gender, level of study and religion of the participants.



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All the respondents had a positive attitude towards CPR/BLS, but half of them had actually practiced CPR/BLS.

The medical curriculum of students in AAU, Ekpoma should provide more drills for clinical students to perform and practice their skills in BLS.

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