

Knowledge, attitude, and practice on Basic Life Support: a case study of pharmacists in Benin City, Nigeria

IC Eze,  LA Izevbogie,  DN Eduwuirofo,  EO Obobo 

Department of Pharmacy, University of Benin Teaching Hospital, Nigeria

Corresponding author, email: ezeijeoma85@yahoo.com

Abstract

Background: Basic Life Support (BLS) encompasses the early identification and emergency response to cardiorespiratory arrest. While often limited to core clinical cadres, pharmacists are increasingly integral in the value chain of healthcare provision and should be proficient in BLS and cardiopulmonary resuscitation (CPR). To promote this advocacy, evaluating their current knowledge, attitudes, and practices is essential.

Methods: A descriptive, cross-sectional study was conducted among 200 pharmacists in Benin City, Nigeria using a structured and self-administered questionnaire. The tool assessed demographics, BLS-related knowledge, attitudes, and practices following the 2020 BLS guidelines. Inclusion criteria covered licensed pharmacists within Benin City; those practising elsewhere or unwilling to participate were excluded. Inferential statistical tests were used to assess associations between variables.

Results: Of 200 respondents, 109 (54.5%) were male and 91 (45.5%) female with a mean age of 34.16 ± 9.52 years. Only one (1) participant (0.5%) answered ≥ 15 of the 20 BLS knowledge questions correctly. The average knowledge score was 7.54 ± 2.74 . Although no significant association was found between gender and BLS practice, participants who had received BLS training had significantly higher mean knowledge score than those who had not ($p = 0.012$). Almost all the respondents (98.5%) had recommended BLS training inclusion in the undergraduate curriculum.

Conclusion: Pharmacists in Benin City demonstrated limited knowledge and inadequate training in BLS and CPR. Formal BLS instruction and certification should be incorporated into undergraduate pharmacy curricula and professional development programmes.

Keywords: Basic Life Support (BLS), cardiopulmonary resuscitation (CPR), pharmacists, knowledge, attitude, practice

© Authors

<https://doi.org/10.36303/SAPJ.1348>

Introduction

Basic Life Support (BLS) refers to a set of fundamental life-saving procedures, including cardiopulmonary resuscitation (CPR), essential for stabilising patients in cardiac or respiratory arrest. The protocol involves early recognition of cardiac arrest, prompt initiation of CPR, airway management, ventilation, and defibrillation when needed.¹ Traditionally practiced among physicians and nurses, BLS is increasingly recognised as necessary for all healthcare professionals, including pharmacists.² The American Heart Association (AHA) and other global bodies advocate that every healthcare provider, irrespective of their specialisation, should be trained in BLS.³

Pharmacists, especially in hospitals and community settings, often serve as first-line responders in emergencies and play critical roles in emergency medical teams, including drug preparation, dose calculation, and CPR drug administration.⁴ Globally, pharmacists' involvement in BLS remains underreported, with wide disparities in knowledge and practice.

The level of knowledge about BLS and the attitude of professionals vary as evidenced by several surveys conducted in different parts of the world.⁵ In a systematic review across Arab countries, healthcare providers demonstrated significant deficiencies in BLS knowledge and skills.⁶

Studies in African settings show similar trends. In Uganda, poor CPR skill retention and knowledge gaps were reported even among trained medical students and healthcare staff.⁷ Similarly, poor knowledge and practical skills were reported among medical practitioners in South Africa.⁸ In Nigeria, existing literature has mainly focused on doctors and nurses, consistently reporting poor knowledge and limited exposure to formal BLS training.^{9–12} However, pharmacists have received minimal attention in this regard, despite playing increasingly visible roles in emergency preparedness and drug management.¹³

Some international studies have examined pharmacist BLS involvement. In Saudi Arabia, Shahabe et al. found that although 78% of pharmacist interns had received training, only 34.1% had average knowledge scores.⁵ Riaz et al. revealed that 66.7% of pharmacy students in Pakistan had average knowledge of BLS, but just a few (17.6%) reported having undergone BLS training.¹⁴ Similarly, Machado et al. showed that pharmacists involved in CPR teams reported significant skill gains after training, but such opportunities remain limited and unsystematised.¹⁵ A Canadian survey by Bolt et al. also noted inconsistent training among hospital pharmacists.¹⁶

Despite these findings, there is currently no comprehensive study exploring the knowledge, attitude, and practice (KAP) of pharmacists in Nigeria concerning BLS. Addressing this gap is essential for curriculum reform, professional development

planning, and patient safety improvements. Therefore, this study aims to assess the knowledge, attitude, and practice of pharmacists in Benin City, Nigeria, regarding BLS. It seeks to identify key deficiencies and provide evidence-based recommendations to inform curriculum design and future intervention strategies.

Methods

Study design

A descriptive, cross-sectional, quantitative study was conducted to assess pharmacists' knowledge, attitudes, and practices concerning BLS in Benin City, Nigeria. A structured, self-administered questionnaire was used, based on the 2020 guidelines of the International Liaison Committee on Resuscitation (ILCOR).

Study setting and population

The study was conducted among 226 licensed pharmacists practising in Benin City, Edo State. Benin City is a major metropolitan city in southern Nigeria characterised by high human activity. Participants were drawn from hospitals, community pharmacies, administrative, academic, and industrial settings. Inclusion criteria were licensed pharmacists working in Benin City willing to consent. Exclusion criteria included practice outside the city, lack of a pharmacy degree, and incomplete responses.

Sample size determination

Using the Yamane formula with finite population correction:¹⁷

$$nf = \frac{n}{1 + n/N'} \quad \text{where} \quad n = \frac{Z^2 \cdot p(1-p)}{d^2}$$

Assuming $P = 40\%$ prevalence of BLS knowledge,⁵ with a 95% confidence level ($Z = 1.96$), a 5% margin of error ($d = 0.05$), and based on a population of 420 pharmacists,¹⁸ the minimum sample was 196. With an attrition rate of 15%, 30 pharmacists were added to account for non-responses, bringing the sample size to 226 participants.

Ethical approval

Ethical approval was granted by the Human Research and Ethics Committee of the University of Benin Teaching Hospital (Reference No ADM/E/22/A/VOL. VII/48311717, dated 19 September 2024). Informed consent was obtained while the identities of respondents and affiliated institutions were anonymised to maintain confidentiality.

Study tool development

The questionnaire was adapted from validated BLS assessment tools and aligned with the 2020 AHA-ILCOR guidelines.^{5,14,19} It comprised four sections: (i) Demographics (age, sex, qualification, years of experience); (ii) Knowledge (20 items—MCQs and true/false); (iii) Attitude (4 items); (iv) Practice (4 items).

Validity and reliability

Face and content validity were confirmed by three pharmacists and two emergency medicine physicians. A pilot study was conducted with 20 pharmacists who were excluded from the main sample. Based on feedback, minor adjustments were made to clarify wording. Internal consistency for the knowledge section yielded a Cronbach's alpha of 0.82, indicating high reliability.¹⁷ No further ethical review was required post-adjustment due to minimal tool changes.

Data collection

Data were collected from September to October 2024 using a captive audience method. Questionnaires were distributed in person during professional meetings and at workplaces. Participants completed the forms onsite without external assistance. Trained assistants clarified questions when needed. Incomplete questionnaires were excluded. Informed consent was obtained from all participants. The questionnaire included an introductory note stating that participation was voluntary and that completion and submission of the form implied informed consent.

Data analysis

Responses were entered into Microsoft Excel and analysed with SPSS version 29. Descriptive statistics (frequencies, percentages, means) were calculated. Group comparisons were performed using independent t-tests and one-way ANOVA. Fisher's exact test evaluated associations between gender and BLS practice. Significance was set at $p < 0.05$.

For the knowledge section, each correct response was awarded one (1) point, while incorrect responses were scored as 0. The maximum attainable knowledge score was 20.

Responses from the attitude and practice sections were analysed descriptively as categorical variables (Yes, No, or Don't know), and were not converted into numeric scores.

Results

Demographic characteristics

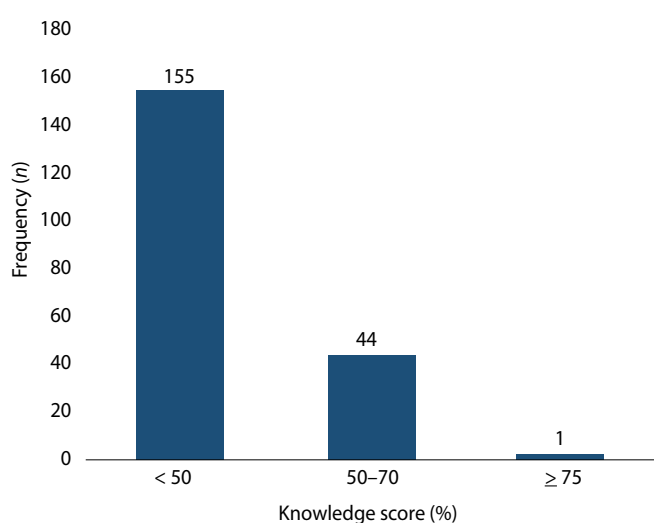
A total of 226 questionnaires were distributed, and 205 were returned, yielding a 91% response rate. After excluding five incomplete responses, 200 were included in the analysis. Participants ranged in age from 22 to 70 years (mean: 34 ± 9.5 years), and 54.5% ($n = 109$) were male. Years of professional practice ranged from 1 to 40 years, with a mean of 8.2 ± 9.3 years. Demographic characteristics are summarised in Table I.

Knowledge

Respondent scores for the 20 questions ranged from 5% to 80%, with a mean score of 7.54 ± 2.74 . None of the participants achieved a 100% score, and 77.5% ($n = 155$) scored below 50%. The overall knowledge score distribution is shown in Figure 1.

Table I: Demographic distribution of participants

Variable	Respondents (n)	Respondents (%)
Gender		
Male	109	54.5
Female	91	45.5
Years of Practice		
≤ 10 years	162	81
11–20 years	14	7
≥ 21 years	24	12
Level of qualification		
BPharm	116	58
Pharm D	63	31.5
Postgraduate	19	9.5
Pharm D and postgraduate	2	1

**Figure 1:** Overall distribution of knowledge score amongst the respondents

Approximately 67.5% ($n = 135$) of respondents were familiar with Basic Life Support (BLS), but only 32.5% ($n = 65$) correctly identified the number of basic BLS steps. When asked about the recommended maneuver for airway management in an injured victim, only 19.5% ($n = 39$) selected the jaw thrust, 64% ($n = 128$) incorrectly chose the head tilt, which is contraindicated in suspected cervical spine injury.²⁰ Early defibrillation was correctly identified as the key to restoring normal cardiac rhythm by 22% ($n = 44$), and 22.5% ($n = 45$) correctly recognised respiratory arrest as the most common indication for BLS in infants and toddlers. Among adult BLS components, only 45.5% ($n = 91$) of respondents identified the correct sequence of steps in adult CPR to be Compression-Airways-Breathing. About 50% ($n = 100$) knew the correct compression rate (100–120/min), while 35% ($n = 70$) were aware of the 30:2 compression-to-ventilation ratio. Knowledge of the recommended compression depth (2 inches) was low at 30.5% ($n = 61$), and only 23% ($n = 46$) identified the correct hand placement at the centre of the chest.

Mean knowledge scores across respondent characteristics are detailed in Table II. No significant differences were observed across demographic groups ($p > 0.05$), but participants with prior BLS training had significantly higher scores than those without ($p = 0.012$).

Attitude of the participants

Table III shows the distribution of the various attitude-related responses amongst respondents. Most participants (79.5%, $n = 159$) were not reluctant to perform CPR.

Practice of BLS among participants

Only 11% of the 200 participants ($n = 22$) indicated they had received BLS training, while a smaller proportion (7%, $n = 14$)

Table II: Comparison and distribution of knowledge score with the different characteristics of the participants

Demographic	Number	Minimal score	Maximal score	Mean score	Standard Deviation	P-value
Gender						
Male	109	01	16	7.60	2.63	0.63 ^{NS}
Female	91	02	14	7.47	2.88	
Level of qualification						
BPharm	116	02	14	7.44	2.65	0.60 ^{NS}
Pharm D	63	01	16	7.81	2.95	
Postgraduate	19	02	14	7.47	2.67	
Pharm D and Postgraduate	2	04	07	5.5	2.12	
Years of Practice						
≤ 10 years	162	02	16	7.78	2.75	0.45 ^{NS}
11–20 years	14	04	14	7.36	2.79	
≥ 21 years	24	01	12	6.25	1.94	
Previous Training						
Yes	22	04	16	10.36	3.42	0.012
No	171	02	14	7.11	2.47	

P-values by ANOVA and independent sample t-test. P-value < 0.05 is considered statistically significant. NS statistically insignificant.

Table III: Attitude of participants on BLS

S/N	Opinions	Responses		
		Yes <i>n</i> (%)	No <i>n</i> (%)	I don't know <i>n</i> (%)
1.	I am willing to perform CPR	159 (79.5)	19 (9.5)	22 (11)
2.	I would want a layperson (trained in BLS) to resuscitate me	165 (82.5)	21 (10.5)	14 (7)
3.	BLS training should be mandatory in the undergraduate curriculum	197 (98.5)	2 (1)	1 (0.5)
4.	Pharmacists need to be competent in BLS skills	197 (98.5)	2 (1)	1 (0.5)

Table IV: Practice of respondents of BLS

S/N	Practice Indicator	Response		
		Yes <i>n</i> (%)	No <i>n</i> (%)	I don't know <i>n</i> (%)
1.	I have adequate training in BLS skills	22 (11)	171 (85.5)	7 (3.5)
2.	I attend BLS training every 2 years	1 (0.5)	199 (99.5)	
3.	I am confident in resuscitating a person in need of CPR	114 (57)	75 (37.5)	11 (5.5)
4.	I have performed CPR on a person with CRP	14 (7)	186 (93)	

Table V: Association between gender and practice of BLS among pharmacists

Practice Indicators	Response	Male (<i>n</i> = 109)		Female (<i>n</i> = 91)		<i>p</i> -value
		N	%	N	%	
I have adequate training in BLS skills	Yes	15	13.8%	7	7.7%	0.165NS
	No	88	80.7%	83	91.2%	
	I don't know	6	5.5%	1	1.1%	
I attend BLS training every 2 years	Yes	1	0.9%	0	0%	0.359NS
	No	108	99.1%	91	100%	
I am confident in resuscitating a person in need of CPR	Yes	67	61.5%	47	51.6%	0.281NS
	No	35	32.1%	40	44.0%	
	I don't know	7	6.4%	4	4.4%	
I have performed CPR on a person with CRP	Yes	9	8.3%	5	5.5%	0.291NS
	No	100	91.7%	86	94.5%	

P-values by Fisher's exact test. *P*-value < 0.05 is considered to be statistically significant. NS statistically not significant.

reported having performed CPR on an individual experiencing cardiac arrest. The distribution of responses to the practice of BLS is shown in Table IV.

Table V shows the association between the gender of the respondents and their practice of BLS. No significant association was found between the gender of participants and any of the practice indicators (all *p* < 0.05). Both male and female pharmacists demonstrated similarly low levels of BLS training, confidence, and CPR performance. A small percentage of pharmacists have performed CPR in practice, with a slightly higher proportion among males (8.3%) than females (5.5%).

Additional Fisher's exact tests were performed to explore associations between selected demographic characteristics and attitude/practice indicators. No statistically significant associations were observed between gender, qualification, or years of practice and participants' willingness to perform CPR, confidence, or belief in mandatory BLS training (all *p* > 0.05). These findings suggest that positive attitudes toward BLS training were uniformly distributed across demographic groups.

Discussion

Pharmacists must be proficient in BLS and, where applicable, Advanced Cardiovascular Life Support (ACLS) to respond effectively to emergencies involving adults, children, and neonates.^{4,21} However, widespread deficiencies in CPR skills and retention of updated BLS knowledge persist across healthcare professions, including pharmacists.^{5,6} This study was conducted to assess pharmacists' current knowledge, attitudes, and practices regarding BLS/CPR in Benin City and to inform targeted training interventions.

The mean BLS knowledge score among respondents was 7.54 ± 2.74 , with scores ranging from 1 to 16. Although 22.5% (*n* = 45) answered at least half of the knowledge questions correctly, only 0.5% (*n* = 1) achieved a score ≥ 15 . These findings align with a study by Shahabe et al. in Saudi Arabia, where the mean score among pharmacy interns was 3.88 ± 1.51 with a score range of 1 to 7.⁵ In contrast, Riaz et al. reported that 66.7% of Pakistani pharmacy students had average BLS knowledge,¹⁴ suggesting contextual variations in training exposure and institutional emphasis.

The similarity in mean knowledge scores across BPharm, Pharm D, and postgraduate degree holders in this study (7.44–7.81) indicate that academic qualifications alone do not predict BLS competency. Besides, BLS is not part of the pharmacy curriculum, hence, those who acquired the knowledge gained it through professional development training in BLS. Interestingly, those with both Pharm.D and postgraduate training scored lower (5.55 ± 2.12), implying that higher formal education might not emphasise CPR skill acquisition. Similar to the finding reported by Ragavan et al.,⁸ respondents with fewer years of practice had higher mean scores, suggesting that recent graduates may have had marginally better exposure to BLS-related content or media campaigns. This finding is consistent with global reports where knowledge deteriorates with time unless reinforced through periodic training.²²

The participant who received CPR training every two years had a significantly higher score of 16 than those with irregular or no training (10.36 ± 3.42 vs. 7.11 ± 2.47 ; $p = 0.012$). These results mirror findings by Abbas et al. and Chaudhari et al., who showed significantly better performance among trained versus untrained health workers.^{23,24} CPR knowledge and skills—such as identifying cardiac arrest, chest compressions, ventilation, and airway maintenance—are notoriously difficult to master and retain without regular refreshers.^{25,26} In resource-limited settings, factors such as limited access, lack of institutional support, and time constraints hinder ongoing professional training.

Given that BLS guidelines are periodically updated, integrating training during undergraduate education and mandating biennial refresher courses is vital. Repeated hands-on training not only reinforces technical competence but also boosts confidence and cognitive readiness.²⁷ As advocated by AHA-ILCOR and regional studies, standardising CPR certification across pharmacy curricula can close long-standing skill gaps.^{3,4}

The overwhelmingly positive attitude of respondents toward BLS training is encouraging. In this study, 79.5% expressed willingness to perform CPR when required, despite recognised knowledge gaps. Nearly all participants (98.5%) agreed that BLS competency is essential for pharmacists and should be mandatory in undergraduate programmes. This mirrors findings from Shrestha et al. and Shahabe et al., where most participants, though inadequately trained, were eager to engage in life-saving interventions.^{5,20} Furthermore, Machado et al.¹⁵ reported that positive disposition toward BLS reflects both professional responsibility and awareness of pharmacists' evolving roles in acute care.¹⁵

Only 11% ($n = 22$) of respondents had received prior BLS training, far below the 77–79% reported in studies from Saudi Arabia and by Machado et al.^{5,15} Such disparities underscore the need for localised implementation of BLS programmes and accreditation strategies for pharmacists. Only 7% of respondents reported participating in a CPR event, consistent with Bolt et al., where 23% of pharmacists had real-life exposure.¹⁶ This low rate may be due to the auxiliary role pharmacists typically play during resuscitations,

which often centres on medication preparation, dosage accuracy, and documentation.^{14,28} However, concrete reasons for these findings warrant further investigations.

No significant association was found between gender and BLS training or practice history. However, the results affirm that pharmacists, even when not providing direct CPR, are integral to resuscitation efforts. Therefore, formal, harmonised training, including simulation-based workshops, should be developed at institutional and regulatory levels to elevate pharmacists' preparedness in emergency care.

A major limitation of this study is its reliance on self-reported, questionnaire-based assessments, which do not capture hands-on skills. Future research should include practical evaluations using standardised CPR simulations to better assess competency.

Conclusion

This study revealed a below-average BLS knowledge among pharmacists in Benin City. Despite a positive attitude toward training, a significant number have never been trained. This concerning gap, along with identified barriers, necessitates the immediate implementation of BLS/CPR training in undergraduate curricula and among practising pharmacists, supplemented by periodic refresher courses. Beyond curriculum reforms, other interventions should include:

1. Mandatory certification and recertification policies for pharmacists by regulatory bodies;
2. Incorporation of simulation-based BLS workshops into continuing professional development (CPD);
3. Institution-level training mandates, especially for hospital and community pharmacists;

A holistic approach, combining educational, regulatory, and institutional strategies, is essential to ensure pharmacists are prepared to act effectively during emergencies and save lives.

Conflict of interest

The authors declare they have no conflicts of interest that are directly or indirectly related to the research.

Funding source

This research was supported by funding support from the University of Benin, Benin City, Edo State, Nigeria.

Ethical approval

Ethics approval was obtained from the University of Benin Teaching Hospital Health Research Ethics Committee (Ref: NHREC-UBTH-HREC/24/12/2022B).

ORCID

IC Eze  <https://orcid.org/0009-0000-6368-7485>

LA Izevbigie  <https://orcid.org/0009-0004-2859-5234>

DN Eduvuirofo  <https://orcid.org/0009-0001-7708-4068>

EO Obobo  <https://orcid.org/0009-0000-2271-1207>

References

- Sharma R, Attar NR. Adult basic life support awareness and knowledge among medical and dental interns completing an internship at a deemed university. *J Health Allied Sci NU*. 2012;20(3):6-13. <https://doi.org/10.1055/s-0040-1703580>.
- Andressa OG, Laiza SA, Marcella SC, et al. Basic Life Support: A literature review about its relevance and level of knowledge of health professionals. *Int J Adv Eng Res Sci*. 2020;1(7):152-5.
- Cardiopulmonary Resuscitation: Statement by the ADHOC Committee on Cardiopulmonary Resuscitation. *JAMA*. 1966;198:372-9. <https://doi.org/10.1001/jama.1966.03110170084023>.
- Alomi YA, Kenani RA, Alzaid SM, Alshehre WH. Knowledge of pharmacists about cardiopulmonary resuscitation medications. *Int J Pharmacol Clin Sci*. 2022;11(3):24-33. <https://doi.org/10.5530/ijpcs.2022.11.15>.
- Shahabe AS, Hassan MA, Anas AR, et al. Knowledge and attitude about Basic life support and Emergency medical services amongst health care interns in University Hospitals: A cross-sectional study. *Emerg Med Int*. 2019. <https://doi.org/10.1155/2019/9342892>.
- Alsabri MAH, Elsayed SM. Knowledge, attitude and perceptions of healthcare workers in Arab countries regarding Basic Life Support: A systematic review and meta-analysis. *Acute Crit Care*. 2024. Available from: <https://pmc.ncbi.nlm.nih.gov/articles/PMC11077391/>.
- Ssewante N, Wekha G, Iradukunda A, Musoke P. Basic life support, a necessary inclusion in the medical curriculum: a cross-sectional survey of knowledge and attitude in Uganda. *BMC Med Educ*. 2022. <https://doi.org/10.1186/s12909-022-03206-z>.
- Ragavan S, Schneider H, Kloeck WG. Basic resuscitation: knowledge and skills of full-time medical practitioners at public hospitals in Northern Province. *S Afr Med J*. 2000;90(5):504-8.
- Ibrahim A, Godspower CM, Haliru I, et al. Practice of cardiopulmonary resuscitation among healthcare providers in a tertiary healthcare centre in a semi-urban setting. *J Acute Dis*. 2019;8(4):160-4. <https://doi.org/10.4103/2221-6189.263709>.
- Sadoh WE, Osariogigbon W. Knowledge and practice of cardiopulmonary resuscitation amongst doctors and nurses in Benin City, Nigeria. *Niger Hosp Pract*. 2009;3:1-2. <https://doi.org/10.4314/nhp.v3i1-2.45616>.
- Osinaike BB, Aderinto DA, Oyeibanji EO, et al. Evaluation of doctors in a Nigerian Tertiary hospital about CPR. *Niger Med Pract*. 2007;52:16-8. <https://doi.org/10.4314/nmp.v52i1.28884>.
- Olajumoke TO, Afolayan JM, Adekunle MA. Cardiopulmonary resuscitation - Knowledge, attitude and practices in Osun state, Nigeria. *J West Afr Coll Surg*. 2012;2(2):23-31.
- Jackevicius C. Pharmacist participation in CPR needs resuscitation. *Can J Hosp Pharm*. 2015;68(4):275-9. <https://doi.org/10.4212/cjhp.v68i4.1465>.
- Riaz S, Akram S, Shoukat M, et al. Assessment of knowledge of cardiopulmonary resuscitation among pharmacy students of Mirpur. *J Adv Pharm Pract*. 2019;1(1):24-33.
- Machado C, Barlows TG, March WA, et al. Pharmacists on the emergency cardiopulmonary resuscitation team: their responsibilities, training, and attitudes. *Hosp Pharm*. 2003;38(1):40-9. <https://doi.org/10.1177/001857870303800113>.
- Bolt J, Semchuk W, Loewen P, et al. A Canadian survey of pharmacists' participation during cardiopulmonary resuscitation. *Can J Hosp Pharm*. 2015;68(4):290-5. <https://doi.org/10.4212/cjhp.v68i4.1468>.
- Araoye MO. Research methodology with statistics for health and social sciences. Ilorin, Nigeria: Nathadex Publishers; 2004. p. 115-21.
- Department of Information Management, State Secretariat, Pharmaceutical Society of Nigeria, Benin City, Edo State, Nigeria. Accessed 12/07/24.
- Panchal AR, Bartos JA, Cabanas MD, et al. Part 3: Adult basic and advanced life support: 2020 AHA guidelines for CPR and ECC. *Circulation*. 2020;142(16 suppl. 2):S366-S468.
- Shrestha R, Batajoo KH, Piryani RM, Sharma MW. Basic Life Support knowledge and attitude of medical/paramedical professionals. *World J Emerg Med*. 2012;3(2):141-5 <https://doi.org/10.5847/wjem.jissn.1920-8642.2012.02.011>.
- Alqahtani A, Alshahrani M, Al-Mansour M, et al. Knowledge and attitudes about basic life support among pharmacists in Riyadh, Saudi Arabia. *Int J Health Sci*. 2021;15(2):56-63.
- Madden C. Undergraduate nursing students' acquisition and retention of CPR knowledge and skills. *Nurse Educ Today*. 2006;26(3):218-27. <https://doi.org/10.1016/j.nedt.2005.10.003>.
- Abbas A, Bukhari SI, Ahmad F, et al. Knowledge of basic life support among medical students. *J Pak Med Assoc*. 2011;61(8):780-5.
- Chaudhari T, Dave A, Ratnani IJ. Impact of BLS training on knowledge and skills of healthcare professionals: A comparative study. *Int J Sci Res*. 2018;7(1):186-90.
- Hamilton R. Nurses' knowledge and skill retention following cardiopulmonary resuscitation training: A review of the literature. *J Adv Nurs*. 2005;51(3):288-97. <https://doi.org/10.1111/j.1365-2648.2005.03491.x>.
- Mptos N, De Wever B, Cleymans N, et al. Repetitive sessions of formative self-testing to enhance CPR training outcome: A randomized trial. *Resuscitation*. 2014;85(6):869-73. <https://doi.org/10.1016/j.resuscitation.2014.06.011>.
- Field JM, Hazinski MF, Sayre MR, et al. Part 1: Executive summary. 2010 AHA Guidelines for CPR and ECC. *Circulation*. 2010;122(18 Suppl. 3):S640-S56.
- Blanchard R, Koutlakis-Barron I, Nykamp D. Role of pharmacists during in-hospital cardiopulmonary resuscitation events: A systematic review. *Am J Health Syst Pharm*. 2018;75(5):326-33.

Questionnaire

This research is solely for academic purposes, and all information provided will be treated with strict confidentiality.

NOTE: Completion and submission of this questionnaire will be considered your informed consent to participate in this study.

ABBREVIATIONS. BLS – Basic Life Support; CPR – Cardiopulmonary Resuscitation; CRP – Cardiopulmonary Arrest

Please provide the correct answers to these questions.

1. DEMOGRAPHIC DATA

(i) Age (ii) Gender: Male Female (iii) Years of practice (iv) Indicate professional qualifications attained: Bachelor of pharmacy Doctor of pharmacy Postgraduate

2. KNOWLEDGE

- Which is used for patients with life-threatening illnesses or injuries? (a) Effective Life Support, (b) Basic Life Support, (c) Emergency Life Support.
- The International Liaison Committee on Resuscitation (ILCOR) was formed in the year (a) 1995, (b) 1992, (c) 1922.
- Basic Method or Steps involved in BLS include: (a) A seven-step approach, (b) A five-step approach, (c) A ten-step approach.

- In evaluating a patient's response in an emergency, the following are quickly assessed for level of consciousness, except: (a) Pain, (b) Weakness, (c) Verbal.
- Which of the following is the preferred method of opening the airway? (a) Jaw Thrust Maneuver, (b) Head Tilt Maneuver, (c) Chest Up Maneuver.
- CPR is carried out on a patient when the respiratory rate is below a range of (a) 20–30 breaths/min, (b) 30–40 breaths/min, (c) 12–20 breaths/min.
- Which of the following is the key to returning a patient's heart to normal rhythm? (a) Early defibrillation, (b) Early CPR, (c) Late defibrillation.
- Which of the following is the most common indication of BLS in infants and toddlers? (a) Seizures, (b) Hyperthermia, (c) Respiratory arrest.
- In case of drowning, a BLS provider should carry out as soon as an unresponsive patient is removed from water: (a) CPR, (b) Secure intravenous line, (c) Defibrillation.
- Following the routine resuscitation guideline, an unresponsive choking patient should be in which of the following positions? (a) Kept lying by the side, (b) kept upright with head tilted, (c) lowered to the ground while CPR is initiated.

11. The most important steps of BLS involve which of the following options: (a) Five link chain of survival, (b) Six link chain of survival, (c) Seven link chain of survival.
 12. A trained BLS provider is encouraged to perform of the chain of survival: (a) First 2 steps, (b) First 3 steps, (c) First 4 steps.
 13. and are the most important aspects of BLS to ensure a patient survives: (a) CPR and intravenous line, (b) CPR and advanced airway management, (c) CPR and defibrillation.
 14. A heart that is in Asystole (flat line) can be restored by CPR. YES () NO ().
 15. The sequence of steps taken in adult CPR is Compression – Airway – Breathing. YES () NO ().
 16. The first thing to do when confronted with a collapsed person is to clear the area. YES () NO ().
 17. The recommended number of compressions per minute is 100–120. YES () NO ().
 18. The recommended ratio of compressions to ventilation is 3:2. YES () NO ().
 19. The recommended depth of compression in adults is at least 5 inches. YES () NO ().
 20. The recommended way to determine the location point for chest compression is to find the centre of the chest. YES () NO ().
3. ATTITUDE
1. I am willing to perform CPR. YES () NO () I don't know ().
 2. I would want a layperson (trained in BLS) to resuscitate me. YES () NO () I don't know ().
 3. BLS training should be mandatory in the undergraduate curriculum. YES () NO () I don't know ().
 4. Pharmacists need to be competent in BLS skills. YES () NO () I don't know ().
4. PRACTICE
1. I have adequate training in BLS skills. YES () NO () I don't know ().
 2. I attend BLS training every 2 years. YES () NO ().
 3. I am confident in resuscitating a person in need of CPR. YES () NO () I don't know ().
 4. I have performed CPR on a person with CRP. YES () NO ().