NJHS Nile Journal of Health Sciences

Assessment of Knowledge of Basic Life Support Among Health Workers in Some Hospitals of the Federal Capital Territory Administration

Évaluation Des Connaissances Des Agents De Santé Dans Certains Hôpitaux De L'administration Du Territoire De La Capitale Fédérale En Matière De Soins De Base En Réanimation Chez L'adulte

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ABSTRACT

Background: *Basic life support (BLS) is the emergency care given to patients who have had cardiac arrest. It can be provided by trained or lay people. It maintains a patient's life pending diagnosis and treatment.*

Methodology: *A cross-sectional descriptive study was conducted among all health workers in some Federal Capital Territory Administration hospitals. Using an online survey tool, the Google form, we evaluated their knowledge of the 2020 American Heart Society guidelines of cardiopulmonary resuscitation (CPR), and their conduct of CPR and noted their profession and years of practice. Completion of the form was voluntary and confidential.*

Results: *The data was obtained from 188 health workers. Eighty-four (44.7%) were doctors, 79 (42%) were nurses and 25 (13.3%) were other health workers. The percentage of respondents irrespective of profession who got each question right ranged from 3.20 to 86.70%. The mean score was 50.31 ± 17.42%.*

Conclusion: *Insufficient knowledge of cardiac arrest among health professionals is high. The relationship between profession and knowledge of BLS was found to be statistically significant. (p< 0.001) The relationship between years of practice and knowledge of BLS was not found to be statistically significant. (p = 0.290).*

Key Words: *Basic Life Support, Health Workers, Knowledge, Assessment*

ABSTRAIT

Contexte: *Le soutien vital de base (SVB) est l'aide d'urgence aux patients en arrêt cardiaque, assurée par des professionnels ou des non-spécialistes, pour maintenir la vie en attendant diagnostic et traitement.*

Méthodologie: *Une étude transversale descriptive a été menée auprès de professionnels de santé de certains hôpitaux de l'Administration de la Capitale Fédérale. Un formulaire Google a permis d'évaluer leur connaissance des directives 2020 de l'American Heart Society pour la RCP, leur pratique, leur profession et leurs années d'expérience. La participation était volontaire et anonyme.*

Résultats: *Les données ont été collectées auprès de 188 travailleurs de la santé. Quatre-vingt-quatre (44,7%) étaient médecins, 79 (42%) étaient infirmiers et 25 (13,3%) étaient autres travailleurs de la santé. Le pourcentage de répondants ayant correctement répondu à chaque question variait de 3,20 à 86,70%. Le score moyen était de 50,31 ± 17,42%.*

Conclusion: *Les connaissances sur l'arrêt cardiaque restent insuffisantes. La profession est significativement liée aux connaissances du SVB (p < 0,001), contrairement aux années d'expérience (p = 0,290).*

Mots-clés: *Soutien de Vie de Base, Travailleurs de la santé, Connaissances, Évaluation for 11 seconds.*

INTRODUCTION

Basic life support (BLS) can be referred to as the emergency care given to patients who have experienced cardiac arrest (1). This is a type of prehospital medical care that can be provided by trained or lay people. Understanding BLS and Cardio Pulmonary Resuscitation (CPR) is crucial for ensuring that individuals can provide life-saving care in an emergency. It includes instant recognition of cardiac arrest, initiation of emergency response systems, adopting adequate CPR, and implementing rapid defibrillation (2). In the absence of advanced medical care by highly skilled health professionals, it can maintain a patient's life pending a reversal of the condition that caused the arrest. This makes it mandatory not just for health workers but for everyone. The 2020 American Heart Association (AHA) guidelines included defibrillation as part of BLS (3).

Cardiac arrest is the sudden cessation of effective cardiac activity leading to a lack of perfusion of vital organs. The criteria for diagnosing cardiac arrest include; absent carotid pulse, apnoea or agonal breathing, and loss of consciousness or unresponsiveness. If there is no urgent, effective intervention, sudden death occurs. The interventions that have been proven to reverse cardiac arrest include early CPR and/or defibrillation.

Timely CPR improves the likelihood of survival by 2 to 4 times (4). The 2020 AHA guidelines for BLS include recognition and management of cardiac arrest, respiratory arrest, and choking in the adult and paediatric age group (3). For this study, however, we concentrated on adult BLS. Management of cardiac arrest includes a series of life-saving interventions like immediate recognition of cardiac arrest, activating an emergency response team, early CPR, rapid defibrillation, effective advanced life support, and integrated post-cardiac arrest care (5,6).

METHODS

Ethical approval was obtained before the conduct of this study from the Medical Ethics Committee of the hospital. The Respondents participated voluntarily and the confidentiality of their responses was ensured throughout the study to encourage participation.

A cross-sectional descriptive study was conducted among representatives of Health workers in some Federal Capital Territory Administration (FCTA) hospitals in Abuja. Five hospitals were involved; Asokoro, Wuse, Maitama, Nyanya, and Bwari hospitals. Using an online survey tool, the Google form, we evaluated their knowledge of the 2020 AHA guidelines of Adult BLS.

Data was collected using an online survey tool, to assess the health worker's knowledge, skills, and training status towards BLS. The questions were written in accordance with the 2020 AHA guidelines. The participants were representatives of health workers across the hospitals, including doctors, nurses, pharmacists, and physiotherapists. A 21-point multiple choice close-ended question on Google Forms was developed particularly for this study. The study was conducted for six weeks, from 6th November to 20th December 2023.

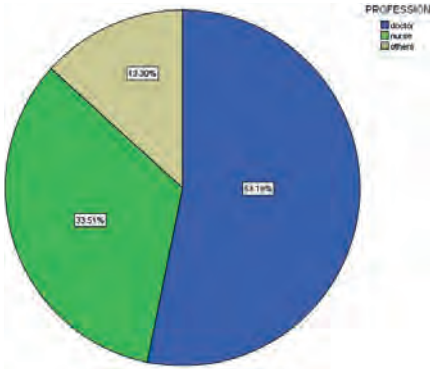
The survey was divided into two sections: General information on cadre of Health workers, years of practice, and training status (independent variable). The other section comprised BLS knowledge level which is the dependent variable. Data was analyzed and presented as frequencies, means, and percentages using Statistical Package for Social Sciences (SPSS software version 26). $p<0.05$ was considered statistically significant.

Seventy percent and above is defined as a good score, 50% to 69%, an average score, while below 50% is a poor score.

RESULTS

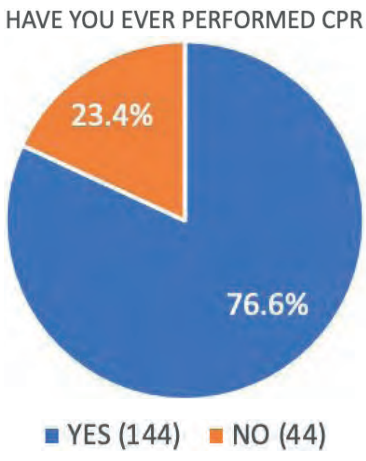
This study included one hundred and eighty-eight respondents. Eighty-four (44.7%) were doctors, 79 (42%) were nurses and 25 (13.3%) were pharmacists, lab scientists, or physiotherapists (Figure 1).

Figure 1: Profession



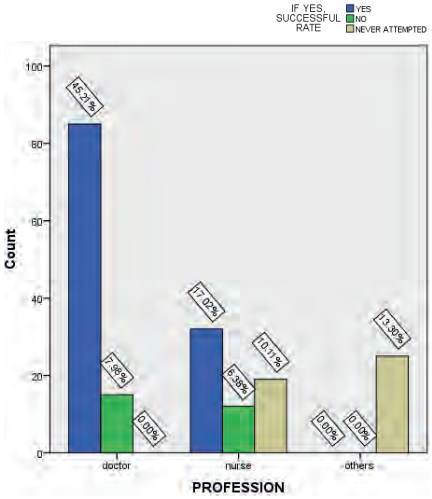
One hundred and forty-four (76.6%) had conducted resuscitation previously, while 44 (23.4%) had never participated in one (Fig 2).

Figure 2: Participation in Cardiopulmonary resuscitation



One hundred and seventeen (62.2%) had a successful outcome, out of which, 85 (45.21%) were doctors, and 32 (17.02%) were nurses. None of the other medical professionals had a successful outcome because none had ever participated in resuscitation (Figure 3).

Figure 3: Profession and successful resuscitation



Thirty (16%) of the health workers had practiced for < 1 – 5yrs, 26 (13.8%) had practiced for 6 – 10yrs, 76 (40.4%) had practiced for 11 to 20 years and 56 (29.8%) had practiced for over 20 years.

Knowledge of the diagnosis of cardiac arrest was generally poor as only 17(13.8%) of the respondents knew the criteria for the diagnosis of cardiac arrest. A large number, 86 (45.7%) thought loss of consciousness is not a criterion. (Table 1).

Basic life support involves opening the airway without the use of sophisticated airway equipment. The majority, 150 (79.8%) knew that neck shift is not one of the ways of opening the airway. However, about half of the Respondents, 93 (49.5%) knew that a blind finger sweep is dangerous as it can further push any object in the mouth down the larynx (Tables 1 and 3)

Table 1: (Knowledge of Basic life support: correct answers highlighted)

KNOWLEDGE ITEM	FREQUENCY (n)	PERCENTAGE (%)
Which of these is NOT a criterion to diagnose cardiac arrest?		
Absence of carotid pulse	17	9
Absence of radial pulse	26	13.8
Apnoea	59	31.4
Loss of consciousness	86	45.8
Grand Total	188	100
Which of these maneuvers does NOT help in opening the airway?		
Neck shift	150	79.80
Chin lift	10	5.30
Jaw thrust	16	8.50
Head tilt	12	6.40
Grand Total	188	100.00
If cervical spine injury is suspected, which maneuver is ideal to open the airway?		
Jaw thrust	79	42
Roll over	53	28.20
Neck shift	9	4.70
Chin lift	47	25.10
Total	188	100
How long do you take to feel for a pulse?		
5 seconds	72	38.30
10 seconds	72	38.30
20 seconds	24	12.80
30 seconds	20	10.60
Total	188	100.00
The compression-to-ventilation ratio during adult CPR is		
30:1	20	11
30:2	32	17
15:1	31	16.50
15:2	105	55.90
Total	188	100
The characteristics of high-quality CPR include which of the following?		
The characteristics of high-quality CPR include which of the following?	7	3.70
Allow complete chest recoil after each chest compression	15	8
Minimize interruptions of CPR	3	1.60
All of the above	163	86.70
Total	188	100.00
Too much air delivered during rescue breathing is likely to result in which complication?		
Lung collapse	44	23.40
Gastric inflation	55	29.30
Pneumothorax	79	42
Brain injury	10	5.30
Total	188	100.00

Table 2: (Knowledge of Basic life support: correct answers highlighted)

KNOWLEDGE ITEM	FREQUENCY (n)	PERCENTAGE (%)
Each rescue breath must be delivered over.		
1 second	48	25.50
2 seconds	81	43.10
3 seconds	26	13.80
4 seconds	33	17.60
Total	188	100.00
Why is allowing complete chest recoil important during chest compressions		
There will be a reduction in rescuer fatigue	4	2.10
It will reduce the risk of rib fracture	18	9.60
The rate of chest compressions will increase	7	84.60
The heart will adequately refill between compressions	159	3.70
Total	188	100.00
During chest compressions, how deep should the chest compressions go		
1 to 2cm	55	29.20
3 to 4cm	71	37.80
5 to 6cm	6	3.20
6 to 7cm	56	29.80
Grand total	188	100.00
Which part of the chest do you place your hands on when performing CPR?		
The right side of the chest	13	7
The left side of the chest	79	42
Upper chest	25	13.30
Just below the nipples	71	37.70
Total	188	100
The proper steps for operating an AED are		
Power on the AED, attach electrode pads, analyze the rhythm, and shock the patient.	99	52.70
Power on the AED, attach the electrode pads, shock the patient, and analyze the rhythm.	67	35.60
Power on the AED, analyze the rhythm, attach the electrode pads, and analyze the rhythm.	10	5.3
Power on the AED, shock the person, attach the electrode pads, and analyze the rhythm.	12	6.4
Total	188	100

Only 32 (17%) had knowledge of the right compression: ventilation ratio which is 30:2 while 105(55.9%) thought the ratio is 15:2, while only six (3.2%) knew how deep the compressions should go. (Tables 1 and 2) The crux of an effective cardiopulmonary resuscitation after prompt recognition is; quality chest compressions along with proper ventilation. Ironically, 163(86.7%) of the respondents knew the characteristics of high-quality chest compressions, but 78 (41.5%) knew that there should be a change every 2 minutes for effective CPR involving two rescuers to prevent fatigue. (Tables 1 and 3).

About half of the respondents, 99 (52.7%) knew the sequence of use of the defibrillation after powering it on. One hundred and eight (57.4%) respondents knew which patients not to use it on. (Tables 2 and 3).

Twenty-one (25%) of the Doctors had a good score, 31(36.9%) had an average score, while 32(38.1%) had a poor score. Eleven (13.9%) of the Nurses had a good score, 28(35.4%) had an average score, and 40 (50.6%) had a poor score.

Of all the other professionals, 25 (100%) had a poor score (Table 4).

Table 3: (Knowledge of Basic life support: Correct answers highlighted)

KNOWLEDGE ITEM	FREQUENCY (n)	PERCENTAGE (%)
Which of the following rhythms can be shocked by an AED?		
Ventricular fibrillation	108	57.40
Atrial fibrillation	35	18.60
Asystole	14	7.50
Pulseless electrical activity	31	16.50
Total	188	100.00
How frequently should the patient's cardiac rhythm be assessed?		
1 minute	41	21.80
2 minutes	73	38.80
5 minutes	69	36.70
7 minutes	5	2.70
Total	188	100.00
An AED can be used safely in all of the following situations except		
Patient with a drug patch	11	5.90
Patient with an implanted pacemaker	57	30.30
The patient lying partially in the water	108	57.40
Patient with BMI>60kg/m2	12	6.40
Total	188	100.00
When doing rescue breathing, which of these is wrong?		
Pinch the nose tightly	76	40.40
Do a blind finger sweep first	93	49.50
Remove any object you see from the mouth	10	5.30
Watch the chest to see if it rises	9	4.80
Total	188	100.00
For effective CPR involving two rescuers, how often should they change positions?		
1 minute	16	8.50
2 minutes	78	41.50
3 minutes	74	39.40
30 seconds	20	10.60
Total	188	100.00

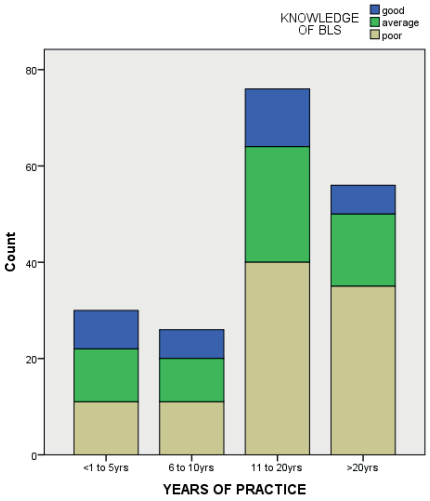
Table 4: Relationship between profession and knowledge of Basic life support

	Good	Average	Poor	Total	Chi-square X^2	P-value
Doctor	21	31	32	84		
	25%	36.90%	38.10%	100%		
Nurse	11	28	40	79	31.253	0.000
	13.90%	35.40%	50.60%	100%		
Others	-	-	25	25		
			100%	100%		

The total number of Health workers that had a good score was 32 (17%).

Out of the Health workers who had practiced for < 1 to 5 years, eight (26.67%) had a good score, 11(36.67%) had an average score, and 11 (36.67%) had a poor score (Figure 4).

Figure 4: Years of practice and knowledge of BLS



Out of those that had practiced for 6 to 10 years, six (23.1%) had a good score, nine (34.6%) had an average score, while 11(42.6%) had a poor score.

Out of those that practiced for 11 to 20 years, 12(15.8%) had a good score, 24(31.6%) had an average score, while 40 (52.6%) had a poor score.

Out of those that had practiced for >20 years, six (10.7%) had a good score, 15(26.8%) had an average score, while 35(62.5%) had a poor score. (Table 5)

Twenty-two (11.7%) of those within the < 1 to 5-year bracket had a successful outcome, two (1.06%) were unsuccessful, while six (3.19%) never attempted. Within the 6 – 10 year bracket, 14 (7.45%) had a successful outcome, seven (3.72%) were unsuccessful, and five (2.66%) never

Table 5: Relationship between years of practice and knowledge of Basic Life Support

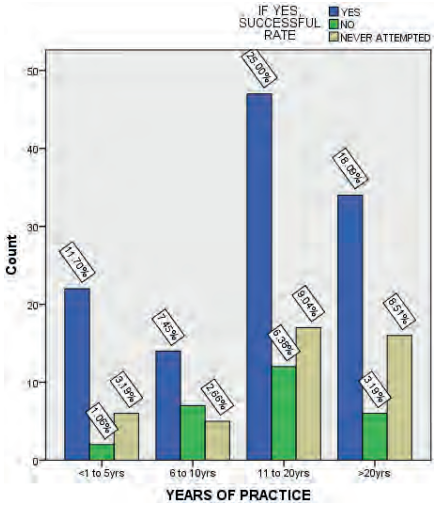
	Good	Average	Poor	Total	Chi-square X^2	P-value
<1 to 5years	8	11	11	30		
	26.70%	36.70%	36.7%	100%		
6 to 10years	6	9	11	26		
	23.10%	34.60%	42.30%	100%	7.345	0.290
11 to 20years	12	24	40	76		
	15.80%	31.60%	52.6	100%		
>20years	6	15	35	56		
	10.7	26.8	62.50%	100%		

Table 6: Average score for all professions and years of practice

Profession	Mean±std
Doctor	56.66±16.509
Nurse	48.62±16.865
Others	34.36±8.961
Years of practice	
<1 to 5yrs	55.66±17.975
6 to 10yrs	53.85±17.663
11 to 20yrs	50.32±16.912
>20yrs	45.80±16.930

attempted. Within the 11 – 20 year bracket, 47 (25%) were successful, 12 (6.38%) were unsuccessful and 17 (9.04%) never attempted. Within the > 20-year bracket, 34 (18.09%) were successful, six (3.19%) were unsuccessful and 16 (8.51%) never attempted (Figure 5).

Figure 5: Years of practice and successful resuscitation



The mean score for all Doctors was 56.66 ± 16.51.

The mean score for all Nurses was 48.62 ± 16.865.

The mean score for all other professions was 34.36 ± 8.961 (Table 6).

The general mean score across was 50.31% ± 17.415 across the board which is an average score.

Results were presented in tables, pie, and bar charts.

DISCUSSION

There's a huge knowledge gap and very likely, a skills gap of BLS among health workers generally. This portrays the lack of institutionalization of regular BLS training. This is not just due to a lack of resources but a lack of prioritization of this very important and lifesaving skill and inadequate manpower to afford the release of staff in batches for training for some days. The percentage of health workers that had a good score was 17%. This was similar to the study carried out by Samar H et al but different from the study carried out by Olajumoke et al (7, 8).

While 76.6% of respondents had previously participated in a resuscitation, 62.2% had a positive outcome. BLS requires regular training to maintain one's knowledge and skills under very stressful circumstances. Lack of regular training showed in the answers by the respondents, necessitating the need for regular training and drills to retain knowledge and refine skills among all cadres of health workers for good results of resuscitation. Determination is needed to ensure all health workers practice this skill regularly to equip them to respond to medical emergencies both within and outside the hospital.

Attention was not paid to the profession (whether doctor, nurse, or any other health professional) because this knowledge should be possessed by everyone. As can be seen from the results, the majority of the respondents were either a doctor or a nurse. Probably other health professionals felt it was beyond their job description. However, it is a well-known fact that all healthcare workers are expected to possess knowledge of BLS (9). A number of patients experience an out-of-hospital cardiac arrest and survival rates are quite low. CPR performed by lay rescuers can be a lifesaving intervention and is known to improve survival by more than two-fold (9). In developed countries, 50% to 75% of deaths from cardiovascular disease events occur outside of hospital (10). In Western Nigeria, 81.6% of sudden cardiac

deaths occurred out of hospital (11). Low patronage of orthodox hospitals in Nigeria may contribute to more out-of-hospital deaths (12). Out-of-hospital cardiac arrest is a leading cause of mortality with about 0.5 – 1 death/1000 population annually (13). The figures are likely to be worse in a developing country like Nigeria with increasing incidence of cardiovascular disease and limited healthcare resources (14).

The majority of respondents 70.2% had practiced for a minimum of 11 years. However, this did not impact their knowledge of BLS. Despite this, probably due to observation and clinical experience, this group had the highest success rate. Again, doctors constituted a higher number in this year bracket, 11 years and above.

BLS certification should be a criterion for employment and regular training, a criterion for promotion, to hone their skills and keep up with the five-yearly update. Also, there's a need for the incorporation of BLS as a standard training in the curriculum of all medical, nursing, and paramedical courses.

Only 13.8% knew the criteria for the diagnosis of cardiac arrest. Not knowing how to diagnose cardiac arrest is worrisome because it then becomes a challenge to know when to intervene swiftly. The hesitation to prompt intervention is largely due to inadequate knowledge.

Out of the health professionals, 79.8% knew ways of opening the airway without the use of airway equipment, though 49.5% didn't know that blind finger sweep is dangerous as it can move the object further down the airway. Rescue breathing, which is the number of ventilation breaths per minute ensures adequate oxygenation and ventilation to a patient who is unconscious and not spontaneously breathing, each should be given over one second. The ventilation rate for adults should be 10 – 12 breaths per minute. This can be performed mouth-to-mouth with or without a barrier. Head tilt, chin lift, and jaw thrust (in the absence of cervical spinal injury) are ways of opening the airway.

About 53% knew the right compression: ventilation ratio while 30.9% knew the right depth of effective cardiac compressions.

The overall average score was 50.31±17.415. This is a general representation of the knowledge about BLS. This is not in keeping with a study conducted by Akinbodewa et al which was 43.6% (15)

CONCLUSION

Health workers in FCTA hospitals have a poor knowledge of BLS. There is a need for regular training and retraining of this essential life skill.

Limitations of Study: Small study population, no control over who fills the Google form, only Adult Basic life support was assessed, only knowledge not skills was assessed because knowing does not guarantee the possession of the requisite skills.

Authors Contribution

Concept and design: Dr Rosemary Nwokorie and Dr Yakubu

Acquisition, analysis, and interpretation of data: Dr. Rosemary Nwokorie, Dr Saidu Yakubu, Dr Offiong Ekeng

Drafting of the manuscript: Dr Rosemary Nwokorie

Manuscript review: Dr. Saidu Yakubu, Dr. Offiong Ekeng

Source of funding: Self

Conflict of Interest: None

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