Awareness and Perceptions of Basic Life Support (BLS) among Staff, Students and Abadina Residents of the University of Ibadan

Temitope Florence Oladokun, Feyintoluwa Anne Ogungbenro, Titilayo Dorothy Odetola, Abimbola Oyeninhun Oluwatosin, and Mary Abiona

ABSTRACT

Background: **Several studies have been conducted on knowledge of Basic Life Support (BLS) among health workers globally, including Nigeria. However, only few have been carried out among non-health workers, especially staff, students and residents of a higher institution in Nigeria. The study therefore assessed the awareness and perceptions of Basic Life Support among staff, students and residents of University of Ibadan.**

Methods: **A descriptive cross-sectional design was used for collecting data for this study. The questionnaire was in three sections, was semi-structured and self-administered based on the set objectives. Data collected were analyzed using the statistical package for social sciences version 21.0.**

Results: **Majority of the respondents were not trained in BLS (77.7%), majority had poor awareness of BLS (61.3%) and a little above average (52.5%) had good perceptions about BLS. A significant number would rather offer BLS to a relative rather than a stranger (86.4%), quite a number would not offer BLS for the fear of harming victim's bones and organs. Many would not offer BLS for the fear of making mistake (79.4%). Majority would not perform mouth-to-mouth resuscitation for the fear of contracting infection (93.5%) while a sizeable number believed that BLS should only be performed by medical personnel (83.9%).**

Conclusion: **Appropriate measures should be taken to improve on the awareness and perceptions of Basic Life Support so as to reduce deaths attributable to Out-of-Hospital-Cardiac-Arrest (OHCA), Sudden Cardiac Arrest.**

Keywords: Awareness, basic life support, perceptions, out-of-hospital-cardiac-arrest.

T. F. Oladokun*
Oyo State College of Nursing and Midwifery, Eleyele, Nigeria.
(e-mail:
temitopeflorenceoladokun@gmail.com)

F. A. Ogungbenro
EverCare Hospital, Lekki, Lagos, Nigeria.

T. D. Odetola
Department of Nursing, Faculty of Clinical Sciences, College of Medicine, University of Ibadan, Nigeria.

A. O. Oluwatosin
Department of Nursing, Faculty of Clinical Sciences, College of Medicine, University of Ibadan, Nigeria.

M. Abiona
Department of Nursing, Faculty of Clinical Sciences, College of Medicine, University of Ibadan, Nigeria.

*Corresponding Author

I. INTRODUCTION

Life-threatening emergencies can occur anytime and anywhere. The lack of training and incompetence to deal with these emergencies can lead to tragic and legal consequences. Basic resuscitation skills, including prompt and effective cardiopulmonary resuscitation (CPR), increases the survival rate following cardiopulmonary arrest. Theoretical knowledge with practical demonstrations and regular practice with up-to-date recommendations is important in maintaining the capability of Basic Life Support (BLS) and Advanced Life Support (ALS) providers [1]. Saving peoples' lives involves a sequence of steps that constitute the chain of survival. This includes four stages: early approach to cohesive medical emergency, early initiation of BLS, early defibrillation, and ALS.

Sudden cardiac arrest is the most common cause of death worldwide with a large variation in survival rates between different countries [2]. Any type of CPR was associated with double survival rate compared with no CPR in a nationwide study conducted in Sweden [3]. Early detection of cardiac arrest and initiation of CPR have been shown to decrease morbidity and mortality [4], [5]. A previous study conducted in Arizona showed that a statewide hands-only CPR public awareness campaign increased bystander CPR rates from 28.2% to 39.9% and improved out-of-hospital cardiac arrest (OHCA) survival rates from 3.7% to 9.8% [6]. The number of OHCA cases in the United States is approximately 300,000 and the mortality rate is 92% [6]. The chance of survival increases two-fold if BLS is conducted by the first person to intervene and with the use of automated external defibrillators [7].

Difficulties in performing bystander CPR were due to the fear of litigation, risk of disease transmission, fear of hurting someone as a result of performing CPR incorrectly, and lack of knowledge about how and when to perform CPR [8]. A study conducted on cardiovascular quality and outcomes revealed that the incidence and outcomes of OHCA are

influenced by several determinants such as variation in risk factors, socioeconomic differences and differences in bystander CPR [9]. In order to provide proper care, any community needs an adequate amount of knowledge and insight on BLS by training either in person or online [10]. An important method to increase CPR and BLS success for any emergency case is to increase public knowledge and understanding of the practical applications of BLS intervention for a successful result after an emergency. Reinforcing knowledge and awareness and increasing willingness to perform bystander CPR contributes to a better outcome after cardiac arrest.

In view of the fact that an assessment of community awareness and perceptions of BLS is scarce in Nigeria, this study therefore assessed the level of awareness and perceptions of BLS among staff, students and residents of the University of Ibadan.

II. PROBLEM STATEMENT

A compelling challenge facing modern medicine is increase in cardiovascular diseases. According to [11] among 56.4 million global deaths in 2015, 39.5 million or 70% were due to non-communicable diseases (NCDs), and 17.7 million people (45% of all NCDs deaths) died from cardiovascular diseases, mainly because of sudden cardiac arrest (SCA) [12]. The prevalence of this disease has been and is expected to continue increasing [2]. Despite the technological advancement in the treatment and other advances in prevention, SCA remains a substantial issue in public health and a leading cause of death globally.

African countries have in the past focused public health efforts on infectious/communicable diseases, but NCDs such as cardiovascular disease is on the rise in this continent [13]. World Health Organization [14] reported that NCDs are becoming a significant cause of morbidity and mortality in African countries, and that about 50% of this burden is attributable to cardiovascular disease.

Unlike advanced countries, the incidence rates and survival from OHCA in Africa remain undefined despite carrying over 80% of the cardiac disease's burden [15]. If students and staff of the institution are not trained in Basic Life Support, this means that in case of any emergency, they would have to wait for a health personnel trained in BLS or take the any victim of cardiac arrest to the health centre before resuscitation could be performed and this may amount to brain damage or death for a victim of SCA [16].

Several studies have been conducted on knowledge of BLS among health workers globally, including Nigeria. However, only few have been carried out among non-health workers, especially staffs, students and residents of a higher institution in Nigeria. The study therefore assessed the awareness and perceptions of Basic Life Support among staff, students and residents of University of Ibadan.

III. PURPOSE OF THE STUDY

The main purpose of the study is to assess the level of awareness and perceptions of BLS among staff, students and Abadina residents living in University of Ibadan campus.

IV. RESEARCH OBJECTIVES

1. to identify the level of awareness of BLS among Staff, students and Abadina residents living in University of Ibadan campus.
2. to identify the perceptions of BLS among Staff, students and Abadina residents living in University of Ibadan campus.
3. to identify the factors responsible for the perceptions of BLS among Staff, Students and Abadina residents living in University of Ibadan campus.
4. to identify the proportion of Staff, Students and Abadina residents living in University of Ibadan campus that is trained in BLS.

V. RESEARCH QUESTION

1. What is the level of awareness of BLS among Staff, Students and Abadina residents living in University of Ibadan campus?
2. What are the perceptions of BLS among Staff, Students and Abadina residents living in University of Ibadan campus
3. What are the factors responsible for the perceptions of BLS among Staff, Students and Abadina residents living in University of Ibadan campus?
4. What is the proportion of Staff, Students and Abadina residents living in University of Ibadan campus that is trained in BLS?

VI. METHODS

A. Research Design and Population

This research utilized quantitative research methodology to determine the awareness and perceptions of staff, students and Abadina residents of University of Ibadan about BLS.

B. Sampling Technique and Sample Size Determination

A multi-staged sampling approach was used to obtain a representative sample of staff, students and Abadina residents of the University of Ibadan.

Stage 1: A simple random sampling technique was conducted by the use of balloting to choose four faculties each for staff and students. The selected faculties for staff were Education, Law, Social Sciences, Technology while those selected for students were Pharmacy, Public Health, Dentistry, Renewable and Natural Resources.

Stage 2: Sample size was calculated for each category
Total population of staff= 163+30+134+96= 423
Using kennan's formula:
Where n=Sample size.
X=0.95
N= Total population size
E=Absolute precision or error (0.05)

$$n = \frac{NX}{(N-1)E^2 + X}$$

$$n = \frac{423 \times 0.95}{(423 - 1)(0.05)^2 + 0.95}$$

$$n = \frac{401.85}{2.005}$$

$$n = 200$$

Adjusting for non-response rate
$$n = \frac{n'}{1 - 0.1}$$

$$n = \frac{200}{0.9}$$

$$n = 222$$

Total population of students= 428+184+210+149= 971
Using kennan's formula:
Where n=Sample size
X=0.95
N= Total population size
E=Absolute precision or error (0.05)

$$n = \frac{NX}{(N - 1)E^2 + X}$$

$$n = \frac{NX}{(N - 1)E^2 + X}$$

$$n = \frac{922.45}{3.375}$$

$$n = 273$$

Adjusting for non-response rate
$$n = \frac{n'}{1 - 0.1}$$

$$n = \frac{273}{0.9}$$

$$n = 303$$

Stage 3: proportionate sampling technique was used to calculate the number of required respondents from each faculty.

Stage 4: an accidental sampling technique was used to select twenty Abadina residents of the University of Ibadan.

This gave a total of 545 respondents.

C. Inclusion criteria

Respondents eligible for this study include:
- Willingness to participate in the study

D. Exclusion criteria

- Staff, Students and residents of the university of Ibadan that have clinical knowledge of the research but are sick or unwilling to participate

E. Research Instrument and Data Analysis

A semi-structured questionnaire consisting of four sections was designed in line with the objectives, research questions and hypotheses to elicit responses from the respondents.

SECTION A: consists of three items addressing the Socio-demographics of the respondents.

SECTION B: was used to identify the level of awareness of BLS in University of Ibadan. It consists of 13 (thirteen) semi-structured statements

SECTION C: This section was used to identify the respondents' perceptions of BLS. It consists of 10 (ten) semi-structured statements and options were provided for the respondents to tick appropriately.

The data were sorted, coded, and entered into the computer and checked for errors and variation using Statistical Package for Social Science version 21.0 (SPSS 21.0).

The data were then subjected to analysis using both descriptive and inferential statistics.

Descriptive statistics of simple frequencies, percentage and tables were used to test the hypothesis.

Objective one: to identify the level of awareness of BLS in the University of Ibadan. This was assessed using questions in section B of the questionnaire. Results were presented using frequency tables and percentages. The mean score was determined based on the score. Those with the mean score and above were categorized as having good awareness while those below the mean score were categorized as having poor awareness.

Objective two: to identify the perceptions of BLS among the University of Ibadan. This was assessed using questions in section C of the questionnaire. Results were presented using frequency tables and percentages. The mean score was determined based on the score. Those with the mean score and above were categorized as having good perception while those below the mean score were categorized as having poor perception.

Objective three: to identify the proportion of the University of Ibadan that is trained in BLS. This was assessed using question 12 of in section C of the questionnaire. Results were presented using frequency tables and percentages.

Hypothesis one: There is no significant association between BLS training and respondent' awareness. This was tested using chi-square.

Hypothesis two: There is no significant association between previous training on BLS and competence in performing BLS. This was tested using chi-square.

VII. PROCEDURE OF DATA COLLECTION

A letter of introduction was obtained from the Department of Nursing, University of Ibadan and ethical approval from the ethical review board of the University of Ibadan to facilitate the process of data collection. Informed consent was obtained from the participants. The questionnaire was administered to respondents on face- to- face contact. Two research Assistants were recruited to assist with the administration and retrieval of questionnaires. Assurance of confidentiality was given to the respondents and informed consent was sought before administration of questionnaire. Daily checking of filled questionnaires was carried out by the researcher at the end of each field day, to avoid incomplete data collection and to ensure accuracy of data.

VIII. ETHICAL CONSIDERATIONS

Letter of Introduction and permission to conduct research was collected from the Head of Department of Nursing, University of Ibadan. Ethical approval was sought from the Ethical Review Board of the University of Ibadan with approval number: NHREC/05/01/2008a.

The study participants were engaged in the study through a verbal informed consent that was obtained from them and they were requested to participate voluntarily.

A. Confidentiality

In this study confidentiality and anonymity was maintained by not recording the names of the respondents. All research instruments were allocated a random number and data were also coded numerically. The research subjects were guaranteed that their identities would not be disclosed to avoid any discrimination following thoughts and opinions that will be disclosed.

B. Respect for Persons

The research subjects were treated with utmost respect, they informed of their autonomy in decision making as regards participation in the study.

C. Non-Maleficence to Participants

No harm was done to the participants before, during and after the study.

D. Voluntariness

The respondents were informed that their participation in the study is voluntary, and that they can withdraw from the study when they so wish.

IX. RESULTS

A. Socio-Demographic Variables of Participants

Table I presents the socio-demographic characteristics of the participants. Analysis revealed majority of the respondents (28.4%) were within ages 16 – 20 years and has secondary as their highest level of education (54.3%).

B. The Level of Awareness of BLS in the University of Ibadan

From Table II only 38.7% had good awareness of BLS 61.3% had poor awareness of BLS.

C. Association between BLS Training and Respondent' Awareness

From the result of the chi-square-test of independent given in Table III, the p-value of the chi square statistic is estimated to be 0.019, since the p-value is less than 0.05, we reject the null hypothesis that there is no significant association between BLS training and respondent' awareness in favor of the alternate hypothesis that there is indeed association between the BLS training and respondents' awareness. This means that BLS training has a significant impact on whether a respondent choosing at random will have good awareness or not. The graphical or exploratory part of this hypothesis test is given in Fig. 1.

D. The Proportion of the University of Ibadan that is Trained in BLS

Table IV reveals that only 22.3% were trained in BLS while 77.7% were untrained.

TABLE I: SOCIO-DEMOGRAPHIC VARIABLES OF PARTICIPANTS

Socio demographic Variables	Frequency	Percentage
Age group		
16-20	155	28.4
21-25	98	18
26-30	50	9.2
31-40	68	12.5
41-50	122	22.4
51-60	52	9.5
Highest level of Education		
Primary	0	0
Secondary	296	54.3
Tertiary	17	3.1
Postgraduate	232	42.6
Category		
Student	303	55.6
Staff	222	40.7
Resident	20	3.7

TABLE II: SUMMARY OF THE AWARENESS AND PERCEPTIONS OF BLS

Level of awareness of BLS	Frequency	Percentage
Good awareness	211	38.7
poor awareness	334	61.3
Total	545	100
Level of perception of BLS		
Good perception	286	52.5
Poor perception	259	47.5
Total	545	100

TABLE III: SUMMARY OF THE CHI-SQUARE RESULT OF THE HYPOTHESES

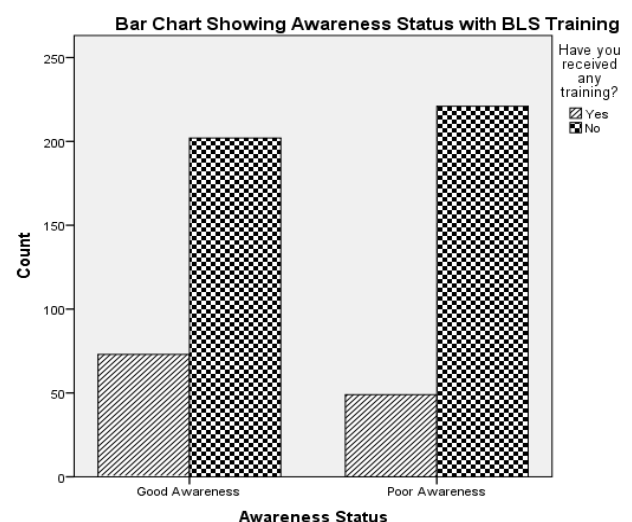|	Hypotheses	Value	Df	P value
Hypothesis one	There is no significant association between BLS training and respondent' awareness.	5.529	1	0.019
Hypothesis two	There is no significant association between previous training on BLS and competence in performing BLS.	1.093	1	0.026

Fig. 1. Awareness status with BLS training.

E. Association between Previous Training on BLS and Competence in Performing BLS

From the result of the chi-square shown in Table III, the p-value is estimated to be 0.026. Since the p-value is greater than 0.05, we reject the null hypothesis and conclude that there is significant association between previous training on BLS and competence in performing BLS. This means that the more training the respondent have on BLS, the higher the level of competence and vice versa. The graphical or exploratory part of this hypothesis test is given in Fig. 2.
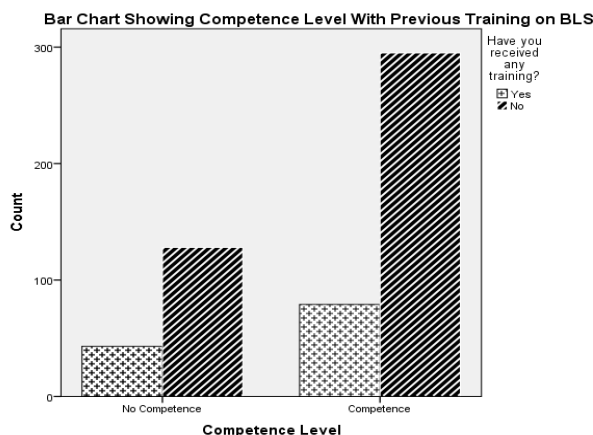

Fig. 2. Competence level with previous training on BLS.

X. DISCUSSION

A. Statement of Principal Findings

1) Socio-Demographic Parameters

Findings from this study revealed that majority of the respondents were within the age range of 16-20 years, this could be attributable to majority of the respondents being undergraduate students. Also, majority of the respondents had secondary education as their highest level of education, this is not unexpected given that most of them were undergraduates.

2) Level of Awareness of respondents about BLS

Majority (61.3%) of the respondents had poor awareness about BLS, this corroborates a study performed by [17] on awareness of basic life support and cardiopulmonary resuscitation among female secondary school students in government schools in Riyadh city, KSA where it was revealed that the level of awareness regarding BLS among female secondary school students in governmental schools in Riyadh was found to be insufficient. This also supports another study carried out among laypersons at the University of Izmir by [18] which showed that significant number of the respondents had poor knowledge about BLS. Another study carried out among medical practitioners in Osun State further revealed that there was a low level of awareness of BLS in Nigeria [19].

3) Level of Perception of Respondents about BLS

A little above average had good perceptions about BLS while the remaining had poor perception. This supports a study on Knowledge and Attitude about Basic Life Support and Emergency Medical Services amongst Healthcare Interns in University Hospitals: A Cross-Sectional Study which showed that participants had good attitude and were optimistic about BLS and BLS training [20]. This also corroborates a study on Knowledge, Attitudes and Perceptions Regarding Basic Life Support among Teachers in Training which revealed that participants displayed poor knowledge and perceptions but positive attitudes with regards to the practice of CPR and BLS [21]. A study in Norway which included 376 secondary school students also showed that majority were willing to perform Cardiopulmonary Resuscitation [22].

4) Factors Responsible for Respondents' Perceptions about BLS

Majority agreed that they had the tendency to give BLS to their relative who has a sudden cardiac arrest than a stranger, this supports a study by [21] on Knowledge, Attitudes and Perceptions Regarding Basic Life Support among Teachers in Training where majority of the participants claimed that they would rather give BLS to their immediate family than a stranger. Significant number of the respondents claimed that they would not give BLS because they may harm the respondents' organs and bones, this also supports a study by [23] where respondents believed they could harm victim's bones and organs, and so would rather not give BLS.

A sizeable number of the respondents would not perform BLS for the fear of making mistake and would rather run away to avoid legal issues. This corroborates a study by [23] on Evaluation of public awareness, knowledge and attitudes towards basic life support: a cross-sectional study where respondents claimed that they feared making mistakes and being prosecuted for unsuccessful CPR (fear of litigation).

Quite a number of the respondents believed that BLS should only be performed by a medical personnel and majority would therefore call for an ambulance than give BLS, this supports a study by [24] where some of the respondents expressed those laypersons could not be expected to perform CPR, but only health professionals and that Laypersons' most important role was calling for professional help.

Majority of the respondents agreed that they would not perform mouth-to-mouth resuscitation for the fear of contracting infection, this is in agreement with a study by [8] on Barriers and Facilitators to Learning and Performing Cardiopulmonary Resuscitation (CPR) in Neighborhoods with Low Bystander CPR Prevalence and High Rates of Cardiac Arrest in Columbus, OH which revealed that a significant number of the respondents revealed that they may not give mouth-to-mouth resuscitation for concern on their personal health.

TABLE IV: PERFORMANCE OF PARTICIPANTS ON AWARENESS TEST ITEMS

Question items	Incorrect		Correct	
	Frequency	%	Frequency	%
The proper rate of chest compression/artificial ventilation during chest compression is?	393	72.1	152	27.9
What of the following areas must the chest compression be applied	385	70.6	160	29.4
What must be the rate of chest compression?	465	85.3	80	14.7
How much force must be applied during chest compression?	466	85.5	79	14.5
Consciousness evaluation	402	73.8	143	26.2
Respiration evaluation	380	69.7	165	30.3
Circulation evaluation	343	62.9	202	37.1
Chest compression means?	372	68.3	173	31.7
	Yes		No	
	Frequency	%	Frequency	%
What BLS Application can you apply:				
I can open the airway	71	13	474	87
I can control respiration	84	15.4	461	84.6
I can ventilate/ conduct mouth-mouth ventilation	123	22.6	422	77.4
Have you heard of a defibrillator before?	370	67.9	175	32.1
Do you know how to give chest compression in case of cardiac arrest and respiratory standstill?	103	18.9	442	81.1
Have you received any training?	122	22.3	423	77.7
The steps in BLS follows the order of the abbreviation C, A, B, D	136	25	409	75

TABLE V: PERFORMANCE OF PARTICIPANTS ON PERCEPTION TEST ITEMS

Perceptions	SA		A		D		SD	
	Freq	%	Freq	%	Freq	%	Freq	%
I have the tendency to give BLS to my relative who has a sudden cardiac arrest than a stranger	110	20.1	361	66.3	70	12.9	4	0.7
I am afraid to give mouth-to-mouth resuscitation to a stranger because I might contract infection	164	30.1	346	63.4	29	5.4	6	1.1
If I see a victim of sudden death, I would run away to avoid legal issues	115	21.1	163	29.9	184	33.8	83	15.2
If I see a victim of sudden death, I would provide resuscitation	76	13.9	110	20.2	347	63.7	12	2.2
I would not give BLS because I do not want to harm the victim's organs	287	52.8	220	40.3	34	6.2	4	0.7
I would not give BLS because I do not want to break the victim's bone	193	35.3	244	44.8	86	15.8	22	4.1
I would rather call an ambulance than give BLS	333	61.1	143	26.3	51	9.3	18	3.3
BLS should only be performed by medical personnel	146	26.7	311	57.2	31	5.6	57	10.5
I will not give BLS because I am afraid of making mistake	189	34.6	244	44.8	101	18.6	11	2.0
BLS does more harm than good	6	1.1	46	8.4	310	56.9	183	33.6

XI. RECOMMENDATIONS

The following recommendations are made based on the findings of the study:

1. Given the willingness of participants to be trained, the Ministry of Health in conjunction with the Ministry of Education in Nigeria should consider implementing BLS and CPR training as part of the academic curriculum for student-teachers.
2. BLS course should not only be incorporated in the curriculum of tertiary education in Nigeria but also regular refresher courses are necessary and should be designed to provide hands-on experience.
3. It is also important that the residents of the tertiary institutions be trained since they are part of its community.
4. Law to protect bystanders should be implemented to prevent fear of litigation in respect to BLS performance.
5. BLS training should be readily available and affordable for Nigerians.

XII. CONCLUSION

This study has shown low awareness but a little above average level of perception of BLS among staff, students and Abadina residents of the University of Ibadan. Therefore, appropriate measures should be taken to improve on the awareness and perceptions of Basic Life Support so as to reduce deaths attributable to Out-of-Hospital-Cardiac-Arrest (OHCA).

CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

REFERENCES

[1]   Kharsan, V, Singh, R, Madan, R, Mahobia, Y, Agrawal A. The ability of oral & maxillofacial surgeons to perform basic life resuscitation in c hattisgarh. *J Clin Diagn Res.* 2015; 9(2)*: ZC58-60.*

[2]   Celermajer DS, Chow CK, Marijon E, Anstey NM, Woo KS. Cardiovascular disease in the developing world: prevalences, patterns, and the potential of early disease detection.*J Am Coll Cardiol.* 2012; 60(14): 1207-16.

[3]   Riva G, Ringh M, Jonsson M, Svensson L, Herlitz J, Claesson A, et al. Survival in out-of-hospital cardiac arrest after standard cardiopulmonary resuscitation or chest compressions only before arrival of emergency medical services: nationwide study during three guideline periods. *Circulation.* 2019; 139(23): 2600- 2609.

[4]   Sasson C, Rogers MA, Dahl J, Kellermann AL. Predictors of survival from out-of-hospital cardiac arrest: a systematic review and meta-analysis. *Circ Cardiovasc Qual Outcomes.* 2010; 3(1):63-81.

[5]   Rajapakse R, Noč M, Kersnik J. Public knowledge of cardiopulmonary resuscitation in Republic of Slovenia. *Wien Klin Wochenschr.* 2010; 122(23-24): 667-72.

[6]   Roger VL, Go AS, Lloyd-Jones DM, Adams RJ, Berry JD, Brown TM, et al. Heart disease and stroke statistics--2011 update: a report from the American Heart Association. *Circulation.* 2011; 123(4): e18-e209.

[7]   Berdowski J, Blom MT, Bardai A, Tan HL, Tijssen JG, Koster RW. Impact of onsite or dispatched automated external defibrillator use on survival after out-of-hospital cardiac arrest.*Circulation.* 2011; 124(20): 2225-32.

[8]   Sasson C, Haukoos JS, Bond C, Rabe M, Colbert SH, King R, Sayre M et al. Barriers and facilitators to learning and performing cardiopulmonary resuscitation in neighborhoods with low bystander cardiopulmonary resuscitation prevalence and high rates of cardiac arrest in Columbus, OH. Circ *Cardiovasc Qual Outcomes.* 2013; 6(5): 550-8.

[9]   Murugiah K, Chen SI, Dharmarajan K, Nuti SV, Wayda B, Shojaee A, et al. Most important outcomes research papers on cardiac arrest and cardiopulmonary resuscitation. *Circ Cardiovasc Qual Outcomes.* 2014; 7(2): 335-45.

[10] Arbon P, Hayes J, Woodman R. First aid and harm minimization for victims of road trauma: a population study. *Prehosp Disaster Med.* 2011; 26(4):276-82.

[11] Verma M, Grover S, Tripathy JP, Singh T, Nagaraja SB, Kathirvel, S, et al. Co-existing Non-communicable diseases and mental illnesses amongst the elderly in Punjab, India. *Eur Endocrinol.* 2019; 15(2): 106-112.

[12] Wellens HJ, Lindemans FW, Houben RP, Gorgels AP, Volders PG, Ter Bekke RM et al. Improving survival after out-of-hospital cardiac arrest requires new tools. *Eur Heart J.* 2016; 37 (19): 1499-503.

[13] Miranda JJ, Kinra S, Casas JP, Smith, GD, Ebrahim S. Noncommunicable diseases in low and middle-income countries: context , determinants and health policy. *Trop Med Int Heal* 2009; 13(10), 1225-34.

[14] World Health Organization. Chapter 1: Burden: mortality, morbidity and risk factors. *Glob Status Rep.* 2011; 9-31.

[15] Krishna CK, Showkat HI, Taktani M, Khatri V. Out of hospital cardiac arrest resuscitation outcome in North India - CARO study. *World J Emerg Med.* 2017; 8(3): 200-205.

[16] Naqvi S, Siddiqi R, Hussain SA, Batool H, Arshad H. School children training for basic life support. *J Coll Physicians Surg Pak.* 2011; 21(10): 611-5.

[17] Al Harbi N, Afifi A, Alateeq M, Tourkmani A, Alharbi T, Albattal S. Awareness of basic life support and cardiopulmonary resuscitation among female secondary school students in government schools in Riyadh city, KSA. *J Family Med Prim Care.* 2018; 7(6):1493-1500.

[18] Pehlivan M, Mercan NC, Çinar İ, Elmali F, Soyöz M. The evaluation of laypersons awareness of basic life support at the university in Izmir. *TurkJ Emerg Med.* 2019; 19(1): 26-29.

[19] Olajumoke TO, Afolayan JM, Raji SA, Adekunle MA. Cardiopulmonary resuscitation-knowledge, attitude & practices in Osun State, Nigeria. *J West Afr Coll Surg.* 2012; 2(2):23-32.

[20] Saquib SA, Al-Harthi HM, Khoshhal AA, Shaher AA, Al-Shammari AB, Khan A, et al. Knowledge and attitude about basic life support and emergency medical services amongst healthcare interns in university hospitals: a cross-sectional study. *Emerg Med Int.* 2019: 9342892.

[21] Ojifinni K, Motara F, Laher AE. Knowledge, Attitude and Perceptions Regarding Basic Life Support Among Teachers in Training. *Cureus.* 2019; 11(12): e6302.

[22] Kanstad BK, Nilsen SA, Fredriksen K. CPR knowledge and attitude to performimg bystander CPR among secondary school students in Norway. *Resuscitation.* 2011; 82(8):1053-9.

[23] Jarrah S, Judeh M, AbuRuz ME. Evaluation of public awareness, knowledge and attitudes towards basic life support: a cross-sectional study. *BMC Emerg Med.* 2018; 18(1): 37.

[24] Zinckernagel L, Malta Hansen C, Rod MH, Folke F, Torp-Pedersen C, Tjørnhøj-Thomsen T. What are the barriers to implementation of cardiopulmonary resuscitation training in secondary schools? A qualitative study. *BMJ Open.* 2016; 6(4): e010481.