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Outcome of Nurse-led Educational Training Programme on the Knowledge and Practice of Basic Life Support among Senior Secondary School Students in Obubra, Cross River State, Nigeria

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Abstract

Cardiac arrest is a medical emergency which can be effectively managed if cardiopulmonary resuscitation is commenced promptly. This study aimed at assessing the outcome of nurse-led educational training program on the knowledge and practice of basic life support among senior secondary school students in Obubra, Cross River State, Nigeria. The study adopted pre-post quasi-experimental design and stratified random sampling technique to select 200 respondents for the study. Data were collected with structured questionnaire. The result revealed that the knowledge level of the students increased significantly after the training, there was an improvement in the students' attitude to cardiopulmonary resuscitation (CPR) after the exposure to the training and showed competence in demonstrating CPR procedures after training. It is recommended that the teaching of CPR should be incorporated into the Nigerian secondary schools' Biology, and General Science curricula without delay.

Keywords: Outcome, Basic life support (BLS), Nurse-led, Knowledge, Practice, Training

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Keywords: Outcome, Basic life support (BLS), Nurse-led, Knowledge, Practice, Training

Introduction

Cardiac arrest is a medical emergency which can be effectively managed if cardiopulmonary resuscitation is commenced promptly. McNally, Robb, Mehta, Vellano, Valderrama, Yoon, and Kellermann, (2011) showed that bystander cardiopulmonary resuscitation (CPR) is the key for determining out of hospital cardiac arrest survival. It is, therefore, critical to educate young people in CPR as a long-term strategy for the community. According to McNally *et al.*, (2011), Iwami, Kawamura, Hiraide, Berg and Nonogi, (2015); training school students to perform cardiopulmonary resuscitation is one possible method of increasing bystander CPR rates.

Evidence shows that cardiopulmonary training is successful in a wide age range of students. Hollenberg, Herlitz, Lindqvist, Riva, Bohm, Rosenqvist and Svensson (2008) informed that studies performed over a wide period using a variety of approaches to train school children in CPR and associated skills show that all training interventions are successful within a short time scale in increasing knowledge and skills of children. Older children perform more successfully on testing, **while** younger children perform basic tasks well, including the use of automated external defibrillator (Plant & Taylor, 2013). A fundamental problem in learning and performing CPR maneuvers based on Plant & Taylor, (2013) report, is the loss of acquired knowledge over time. In one study, looking at the retention of CPR skills of successfully trained adults after 12 months only, 47% demonstrated correct hand placement on the manikin; 44% adequately performed the depth of compressions and compression rate was adequate in just 59%. In the event of cardiac arrest, basic life support can be effective to reduce the chance of death.

According to the 2015 American Heart Association Guidelines reported by Berg, Hemphill, Abella, Aufderheide, Café and Haziniski, (2010), there are four links in the chain of survival: early recognition and call for help, early performance of cardiopulmonary resuscitation, early defibrillation, and post-resuscitation care. Gates *et al.*, (2015) pointed out that scientific evidence suggests that survival rates can be improved significantly at each link in the chain. For instance, immediate cardiopulmonary resuscitation (CPR) can double or triple survival rates (5) and CPR plus defibrillation within five minutes can result in survival rates between 50-75%. According to McNally *et.al.* (2011) there are two critical components to successful resuscitation and reducing preventable

deaths: 1) The presence of a person with knowledge to perform CPR and 2) the successful performance of CPR at the earliest possible time. Repeated training improves performance and retention, but the optimal form and frequency of repeated training are yet to be fully determined.

Attitude has been defined as manner, disposition, feeling, position with regard to a person or a thing, a tendency or an orientation, especially, of the mind (Barongo, Nyenze, & Kebati, 2013). Psychologists have defined attitudes as a learned tendency to evaluate things in a certain way. This can include evaluations of people, issues, objects, or events. Such evaluations are often positive or negative, but they can also be uncertain at times. There are several components of attitudes such as an emotional component (how the object, person, issue or event makes you feel), a cognitive component (your thoughts and beliefs about the subject), and a behavioural component (how the attitude influences your behaviour) (Barongo et.al, 2013).

The International Liaison Committee on Resuscitation (ILCOR) in 2001 strongly recommended that instruction in CPR be incorporated or integrated as a standard part of the school curriculum (Cave et al, 2011). According to Lofti (2007), many countries have initiated CPR Programme for school children and much research work has been done to support the justification of CPR in schools. Although many school systems in other parts of the world have complied with these international standards as observed by Isbye, Meyhoff, Lippert, and Rasmussen (2007); Lorem, Palma and Wik, (2008), the situation in Nigeria is quite different with dearth of evidences to establish work on cardiopulmonary resuscitation involving the Nigerian schools' system. Therefore, there is need to assess the outcome of nurse-led educational training program on the knowledge and practice of basic life support (BLS) among a selected group of senior secondary school students in Cross Rivers State, Nigeria. This study is aimed at assessing the outcome of nurse-led educational training programme on the knowledge and practice of basic life support among senior secondary school students in Obubra, Cross River State, Nigeria.

Research Questions

1. What is the knowledge of senior secondary school students on CPR?
2. What is the attitude of senior secondary school students towards CPR?
3. What is the practice of secondary school students on CPR?

4. What is the influence of nurse-led educational training programme on the knowledge, attitude and practice of CPR among senior secondary school students?

Method and Materials

(i.) Research Design

The study adopted pre-posttest quasi-experimental design to assess the outcome of nurse-led educational training program on the knowledge and practice of basic life support among senior secondary school students in Obubra, Cross River State, Nigeria.

(ii.) Study Setting

The study was carried out in Obubra, the administrative headquarters of Obubra Local Government Area in Cross River State. Obubra is located between Longitude 65⁰N and 60⁰S in the central district of the state. The area has a population of about one million, two hundred thousand (1, 200,000) inhabitants. It is bordered by Ikom Local Government Area in the North, Yakurr Local Government Area in the South, Akamkpa Local Government Area in the East and Ebonyi State in the West.

(iii.) Target Population

The study population comprised senior secondary school students in Government Technical College, Ogada II, Obubra-Obubra Local Government Area, Cross River State, Nigeria.

(iv.) Sampling Technique and Sample

Stratified random sampling technique was used for the study. This was determined by dividing the population for the study into strata according to their attendance in the class. A balloting method was adopted to select 200 respondents from the 400 total population of students in SSS1 and SS 2; 101 students were selected from SS 1 and 99 students from SS 2.

(v.) Instrumentation

A self-structured questionnaire that comprised close-ended questions was used for data collection. The questionnaire was developed from information available in the literature on CPR.

Section A consisted of questions which aim at obtaining information on socio-demographic characteristics of the respondents. Section B contained questions on knowledge of senior secondary school students on basic life support. Section C contained questions on attitudes of senior secondary school students towards basic life support while Section D consisted of questions on practice of secondary school students on basic life support.

Two steps were taken to ensure content validity of the questionnaire. First, the questionnaire was drafted based on relevant information from the literature review. Second, the questionnaire was given to the experts in the profession who reviewed them to identify any area of ambiguity. The corrections were made and a final copy of the instrument was produced.

The reliability was ensured by pretesting the approved questionnaire to 10% of the sample size, (20) among SS 2 students in Ibadan for pretesting. The reliability coefficient (Cronbach's alpha) the questionnaire was 0.74.

(vi.) Procedure for Data Collection

The CPR training and data collection spanned three (3) days. The first two days was scheduled for theoretical and practical demonstration, while the third day was used for revision and posttest. On the first day, a pretest in the form of questionnaire was conducted before theoretical training. On the second day, the students were engaged in practical demonstration using adult and paediatric manikins and essential resuscitation equipment. The content of the training include: definition and indication for CPR, recognizing signs of cardiac arrest, Ensuring your own safety as a rescuer, placing victims in recovery position., checking for responsiveness, maintaining of airway, ABC of resuscitation, and removal of airway obstruction (foreign body) using abdominal thrust. The practical demonstration using manikins involved demonstration of psychomotor skills in carrying out chest compressions, rescue breaths, placing victims in recovery position, opening of airway, and abdominal thrusts. Theoretical knowledge of CPR was measure using objective test items, while their psychomotor skills were measured using objective structured clinical examination (OSCE). Both parts were integrated into the administered questionnaire. The contents of the questionnaire were explained to the students to enable them respond appropriately and 200 copies was also retrieved immediately after completion. The pre-training

and post-training data were used to evaluate the effectiveness of the CPR training.

(vii.) Data Analysis

Completed questionnaires were collected, coded and entered into the computer using the Statistical Package For Social Science (SPSS) version 23.0. Results were presented using descriptive statistics in form of simple percentage tables. Inferential statistics; t-test was used to analyse the hypotheses. The level of significance was set at 5 % (0.05).

(viii.) Ethical Consideration

The study followed the standard ethical principle guiding the use of human participants in research. Access into the local government area and school was secured through a letter of introduction from the Head of Department of Nurse Tutors Programme, University College Hospital, Ibadan. Informed consent was obtained from the principal and class teachers of the participants. Verbal consent was also given by the participants after they were assured of no risks involved in answering the questions as they are for research purposes only. Participants were also given the choice to withdraw from the research if they so wished at any point during the research.

Results

Table 1: Bio- data of the Students (N=200)

Bio-data	Frequency	Percent
Class		
SS1	101	50.5
SS2	99	49.5
Religion		
Christianity	187	93.5
Islam	7	3.5
Traditional	6	3.0
Who are you living with		
Both parents	107	53.5
Father only	27	13.5

Mother only	40	20.0
Uncle	11	5.5
Aunty	10	5.0
Grandmother	5	2.5
Parents level of education		
No formal education	35	17.5
Didn't complete high school	54	27.0
Completed high school	40	20.0
Completed university	71	35.5
Parents occupation		
Civil servants	98	49.0
Unemployed	43	21.5
Self employed	59	29.5

Mean age $\pm$ Standard deviation $\approx$ 15

In Table 1, the ages of the students ranged between 11 and 19 years; the mean age of the students was 15 years. More than half of the students, 93.5% were Christians, 53.0% lived with their both parents. A significant proportion of their parents, 27.0% did not complete high school, while a large proportion of them, 49.0% were civil servants.

Table 2: Attitude of Students to CPR Training

	Disagree		Agree	
	Freq.	%	Freq.	%
I am interested in learning what CPR is about.	2	1.0	197	99.0
I would like to teach others about CPR after learning about it.	3	1.5	196	98.5
I would not mind performing CPR on trauma victim.	26	13.1	173	86.9
One doctor and a nurse only are responsible for initiating CPR.	129	64.8	70	35.2
I would not hesitate to perform CPR on a relative.	13	6.5	186	93.5
I would of a necessity like to perform CPR on a child.	20	10.1	179	89.9

There is hope of survival after CPR.	11	5.5	188	94.5
I would not hesitate to perform mouth to mouth ventilation on a stranger.	23	11.6	176	88.4
I would of a necessity perform CPR on an elderly victim.	7	3.5	192	96.5
I would like that CPR is taught in schools in Nigeria.	4	2.0	195	98.0

Mean age (Pre) = 17 ± 1.6 standard deviation; Mean age (Post) = 18 ± 1.0 Standard deviation

Table 2 shows the attitudes of students to CPR training. The attitude of the students to CPR training was measured on 2-point Likert scale, 99% of the respondents agreed to learn CPR and 98% of the respondents agreed that CPR should be taught in schools in Nigeria. The mean scores of the students on the attitudinal scale pre- and post-training were 17 and 18, respectively.

Table 3: Practical Demonstration of CPR Before and After the Training (N = 200)

	Pre-training		Post-training	
	YES	NO	YES	NO
	n (%)	n (%)	n(%)	n(%)
Perform CPR on child manikin/human	44 (22.0)	156 (78.0)	107 (53.8)	92 (46.2)
Perform CPR on adult manikin/human	50 (25.0)	150 (75.0)	97 (48.7)	102 (51.3)
Perform CPR at least once	42 (21.0)	158 (79.0)	120 (60.3)	79 (39.7)
Never perform CPR before training	125 (62.5)	75 (37.5)	123 (61.8)	76 (38.2)
Don't know how to perform CPR	128 (64.0)	72 (36.0)	110 (55.3)	89 (44.7)

Table 3 displays the students' practical demonstration of CPR before and after exposure to training. Results from the study indicates that before the training, 78.0% of the students had never performed CPR on a child before, Only 25% of them perform CPR regularly, 21.0% had performed it

only once, while 62.5% had never performed it before. After the training, 53.8% agreed that they could perform CPR on a child, as they had learned from the teaching, 48.7% perform CPR regularly, and 60.3% had performed CPR once, while 61.8% had never performed CPR before.

Table 4: t-test of Difference of Mean Knowledge and Attitude and Practical Demonstration of CPR before and after Training

Pairs of variables	MS	SD	CI	t	df	Sig.
Students post knowledge of CPR	70.02	14.7	29.98 – 35.47	23.48	199	0.01*
Students pre-knowledge of CPR	37.30	13.7				
Students post attitude to CPR	18.35	0.96	0.69 - -1.22	7.24	199	0.01*
Students pre attitude to CPR	17.39	1.58				
Demonstration of CPR after training	89.15	4.52	79.20 – 84.40	65.92	199	0.01*
Demonstration of CPR before training	7.35	2.41				

*Significant $P \leq 0.05$

Table 4 shows the students' level of knowledge on the CPR which was tested on 14 multiple choice question items. The cumulative scores of each student were computed in percentages pre and post training. The mean knowledge score of the students (pre and post training) were 37 and 70, respectively. This reveals that the knowledge level of the students increased significantly after the training. Table 4 also shows the student t-test of the difference in the mean scores of CPR before and after the CPR training among the students. The study reveals significant difference in the mean knowledge scores of CPR before and after the CPR training among the students ($t = 23.48$, $df = 199$, $p < 0.05$). The student t-test statistic also reveals a significant difference in the mean scores of students' attitude to CPR before and after the CPR training ($t = 7.24$, $df = 199$, $p < 0.05$). Furthermore, significant difference was found in the mean scores of CPR practical demonstration before and after training among the students ($t = 65.92$, $df = 199$, $p < 0.05$).

Discussion

Findings indicated that the mean knowledge score of the students (pre- and post-training) were 37.30 and 70.02, respectively. This reveals that the knowledge level of the students increased significantly after the training ($t = 23.48$, $df = 199$, $p < 0.05$). This contradicts the findings of Men (2003) who conducted a study regarding knowledge of CPR among the public by telephone questionnaire survey. The study was conducted among 357 people; approximately 12% had received CPR training. CPR knowledge among the respondents was poor, even among the previously trained and especially with regard to circulatory maintenance. However, the **current** study corroborates the findings of Seenivasan and Tamilarasi (2016) which found an association between pre- and post-knowledge about BLS among undergraduate medical students.

Findings in respect of the attitude of the students to CPR training indicated that the mean scores of the students on the attitudinal scale pre training and post training were **17.39** and **18.35**, respectively. This means there was an increase in the students' attitude to CPR after exposure to the training. This is in agreement with Alanazi and Bin-Hotan, (2013) who studied community awareness about cardiopulmonary resuscitation among secondary school students in Riyadh. It was found that the overall attitude **towards CPR was positive**. However, proper CPR information was insufficient. Since CPR plays a vital role in saving lives, more studies are needed to examine CPR information among people who live in the community and suggest strategies to introduce CPR training.

Findings from the study indicates that before the training, 78.0% of the students had never performed CPR on a child, only 25% of them perform CPR regularly, 21.0% had performed it only once, while 62.5% had never performed it on either adult or child before. After the training, 53.8% agreed that they could perform CPR on a child, as they had learned from the teaching. 48.7% perform CPR regularly, and 60.3% had performed CPR once, while 61.8% had never performed CPR before. This is in agreement with Parashar and Kumar. (2010) who conducted a quasi-experimental study to assess the effectiveness of planned teaching programme on knowledge and practice of basic life support among high school students in Mangalore. The sample consisted of 40 rural high school students. The study showed that majority (87.5%) of the students had inadequate knowledge and (100%) had poor practice. The planned teaching **programme** facilitated them to update their knowledge and

practice related to basic life support. Hence, the planned teaching **programme** is an effective teaching strategy to improve knowledge and practice of sample on BLS. Almost all the respondents **in this study** agreed to learn CPR and **indicated** that CPR should be taught in schools in Nigeria. This implies that majority of the respondents displayed positive attitude before CPR training. This is in agreement with Onyeaso and Imogie (2014), who conducted a cross-sectional study aimed at assessing the attitude towards cardiopulmonary resuscitation among some secondary school students in **Rivers State**, Nigeria. The findings revealed that 98.8% exhibited positive attitude towards learning CPR.

The study revealed significant difference in the mean scores of CPR practical demonstration before and after training among the students. This is in agreement with Salunkhe and Dias (2012), who conducted one group pre-test and post-test design on basic life supports (BLS). Equal positive response to the demonstration and teaching was found really useful to the participants after the BLS training. This will help them to take prompt decisions, perform cardiopulmonary resuscitation and save many lives of out-of-hospitals cardiac arrest victims.

Conclusion

From the findings of this study, it can be concluded that respondents had good knowledge, positive attitude and improved practice of basic life support among senior secondary school students in Obubra, Cross River State, Nigeria. Hence, it is crucial to **sensitise** more teachers and students about the benefits of basic life support. It also becomes imperative to adhere strictly to the recommendations above to prevent sudden deaths in Nigeria.

Recommendations

Based on the findings of the study, the following recommendations are made:

- i. The teaching of CPR should be incorporated into the Nigerian secondary schools' **Physical Health Education (PHE) and Biology curricula** without delay and teachers should capitalize on children's willingness to learn this subject as one of the basic emergency life-saving skills and reinforce skills performance on an annual or more frequent basis. Training student teachers in CPR is a major means of laying a strong foundation for Nigerian school children to be properly

- trained in CPR as well as increasing the number of potential bystander CPR providers in Nigerian community.
- ii. Educational institutions have a golden opportunity to conduct research and establish a new standard of practice where competency in CPR is defined by mastery and not by mediocrity.
 - iii. Accountability on behalf of healthcare professionals plays an important role. Healthcare providers must remember that a cardiac arrest can occur anywhere, and they must be prepared to rise to the occasion by seeking yearly certifications and engage in learning opportunities, such as simulations and mock codes, which improve CPR competency and encourage professional development thereby raising the standard of care

Suggestions for Further Studies

This study was carried out to find out the outcome of nurse-led educational training programme on the knowledge and practice of basic life support among senior secondary school students in Obubra, Cross River State, Nigeria. There is need to replicate this study for a larger population in other schools, tertiary and post tertiary, in other states for a wider generalization of the results of the study.

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