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Original Article

Effectiveness of Basic Life Support Training Workshop on Nurses Knowledge and Practice: A Quasi-Experimental Study

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ABSTRACT

Cardiac arrest is fatal if immediate and fast care is not provided by basic life support within the first three to four minutes following cardiac arrest increases the chances of survival. The cardiac arrest must be considered a medical emergency. Cardiovascular arrest is one of the leading causes of death worldwide. **Objective:** To evaluate the effectiveness of basic life support training workshop on nurse's knowledge and practice at a private tertiary care hospital of Karachi. **Methods:** This hospital-based quasi-experimental study was accomplished at Darul Sehat Hospital, Karachi. The study duration was three months, from January to March 2020. The sample size was calculated through GPower; the estimated sample size was 35 nurses. The collected data was analyzed by using software named SPSS version-20. The mean score of pre- and post-basic life support training was computed by using paired t-test and McNemar. p-value ≤ 0.05 is considered the level of significance. **Results:** Before the basic life support training session, only 13 (27.1%) participants performed good in the knowledge test, while after training, 35 (100%) participants achieved a good result in the knowledge. In the skill test, the percentage of participants passing the scenarios increased significantly by 94.3%, with a p-value=0.001. **Conclusions:** It is concluded that basic life support training workshops significantly improved the nurses' knowledge and performance related to cardiopulmonary resuscitation. Hence, it is recommended that periodical training of basic life support is essential for nurses to enhance their knowledge and skills that improve victim survival.

INTRODUCTION

Providing Basic Life Support (BLS) during the first three to four minutes after cardiac arrest enhances the chances of survival. Cardiac arrest is deadly if urgent and speedy care is not provided. The cardiac arrest must be considered a medical emergency. Cardiovascular arrest is one of the leading causes of death worldwide [1]. The current research study revealed that sudden cardiac death accounts for more than 3 million fatalities worldwide, and the survival rate is less than 8 percent [2]. The World Health Organization (WHO) estimates that cardiac arrest and other heart diseases are Pakistan's leading causes of death, accounting for 46 deaths each hour [3]. Hence, the researcher concludes that a basic life support workshop is mandatory to enhance the nurses' knowledge and skills in delivering cardiopulmonary resuscitation care [4]. It is also emphasized that annual evaluations and refresher training are necessary to give healthcare professionals the knowledge and abilities needed to treat cardiac arrest victims [5]. Additionally, it is also suggested that basic life support training programs should be part of both nursing and medical education curricula, and the certification should be mandatory for the students to register their degree to solve these issues [6]. A recent study found that medical staff members' CPR training does not adhere to the

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worldwide standard [7]. Another research study conducted on factors affecting the quality of CPR among inpatients, lack of material, stress among team members, lack of harmony, equipment failure, and the presence of a family member at the start of cardiopulmonary arrest were identified as major contributing factors that hinder effective CPR [8]. Poor knowledge and contributing factors related to cardiopulmonary resuscitation may affect the management and survival of cardiac arrest patients [9]. Literature suggests that nursing bodies and employers should develop a manual containing all the related and most recent advances and discoveries towards CPR. This manual should be audited annually, and active steps should be taken to remove or add new advancements [9, 10]. According to a research study, the nursing staff inadequate theoretical knowledge. Therefore, nurses must take cardiac resuscitation courses to advance their academic knowledge and expertise, which may enhance the effectiveness and safety of patient care [11]. Therefore, this study aimed to determine the effectiveness of BLS training workshop on nurse's knowledge and practice at a tertiary care hospital in Karachi.

METHODS

A quasi-experimental study was performed at Darul Sehat Hospital, Karachi. In this study, Principal Investigator (PI) and certified trainer implements BLS training at Darul Sehat Hospital. PI took a pre-test before intervention and followed by a post-test. All nurses working in Darul Sehat Hospital were the targeted population of this study. The study was accomplished in three months, from January to March 2020, as a synopsis approved by the Ethical Review Committee of Darul Sehat Hospital [IRB-19/LCMD/01]. Calculation of sample size done through software GPower version-3.1 using match pair. Effect zie 0.5, alpha 0.05, and power 80% of the test, the final sample size of this study was 35. Non-probability consecutive sampling technique method was utilized to recruit the participants. Registered nurses with one year of working experience at the bedside were included in this study. On the other hand, those nurses working in teaching areas, and nurses who had already BLS/ACLS certified within 2 years were excluded from the study. An adopted, structured and validated (r=0.82) questionnaire was utilized to determine the effectiveness of BLS training performance [6]. The questionnaire consists of Multiple-Choice Questions (MCQs). For correct answers, 1 number is awarded to participants and zero scores for the wrong answer. The total range of scores was from 0 to 30; zero was the lowest, and 30 was the highest; the total scores were then converted into percent. The level of knowledge was categorized as poor(<50%), fair(50-75%), and good (>75%). Along with the questionnaire, a standardized BLS checklist recommended by AHA was also used to assess the participants for hands-on practice. PI and AHA-certified instructors evaluated the study subjects and certified them. The process of data collection was divided into two parts. In the first part, the PI gave the background of the study and was followed by voluntary participation by signing written consent forms. The second part consists of intervention. Study participants were divided into groups as AHA recommended in the intervention phase. The intervention phase lasted two days, including lectures, skills, hands-on practice, and certification. After that, a post-test was taken to measure the knowledge and practice through the same questionnaire and checklist. The data were analyzed by SPSS version 20.0. Mean and standard deviation was calculated for the quantitative variables, while qualitative variables were computed through frequency and percentage. Moreover, comparing pre- and post-intervention were assessed using McNemar and paired t-tests. p-value <0.05 to be considered as a level of significance.

RESULTS

Out of 35 study participants, a large number of 28 (80%) study subjects were of the age group 20-30 years, while 7 (20%) were of the age group 31-40 years. Among the participants, 21(60%) were female, and 14 (40%) were male. Of enrolled participants, 22 (62.9%) were RN, 11 (31.4%) was generic BS Nursing, and 2 (5.7%) were post RN BSN. Almost all 33 (94.3%) were working as registered nurses, and only 1 (2.9%) head nurse was enrolled in the study. Among study participants, 31(88.6%) had an experience of 1-5 years, and 4 (11.4%) had an experience of 6-10 years (Table 1).

Table 1. Demographic and professional characteristics of study participants

Demographic variables	N (%)
Age	
20-30 year	28(80)
31-40 year	7(20)
Gender	
Female	21(60)
Male	14(40)
Marital Status	
Single	25(71.4)
Married	10(28.6)
Professional Educational	
Diploma in Nursing	22(62.9)
Generic BSN	11(31.4)
Post RN BSN	2(5.7)
Designation	
Head Nurse	1(2.9)
Registered Nurse	33(94.3)

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Assistant Head Nurse	1(2.9)
Working Area	
General Ward	5(14.3)
Paediatric Ward	9(25.7)
ICU	9(25.7)
NICU	2(5.7)
Private Room	4(11.4)
CCU	4(11.4)
E/R	2(5.7)
Years of Experience (In years)	
1-5	31(88.6)
6-10	4(11.4)

Table 2 reveals participants' performance in knowledge tests regarding CPR and skills tests of adult BLS before and after training. Before session 13 (27.1%), participants performed good in the knowledge test, while 35 (100%) participants achieved good results in the knowledge test after training. In the skill test of also the percentage of participants passing the scenarios increased significantly, 94.3% with p-value = <0.001.

Table 2: Knowledge score and skills of Adult BLS with AED

Adult BLS with AED Knowledge	**Pre**	**Post**
	N (%)	**N (%)**
Knowledge		
Poor	22(62.9)	–
Good	13(27.1)	35(100)
McNemar test	p-value = <0.001	
Mean ± SD	10.22 ± 2.22	16.14 ± 0.87
Paired sample t-test	t=-14.121; p-value = <0.001	
Practice		
Passed the scenario	0(0)	33(94.3)
Failed the scenario	35(100)	2(5.7)
McNemar test	p-value = <0.001	

DISCUSSION

Nurses play a pivotal role in life-threatening conditions. Registered nurses and other healthcare professionals must know the latest protocol and guidelines based on BLS skills to save valuable lives and improve the quality of health. Furthermore, sharpen their decision-making for identifying signs of sudden cardiac arrest, airway obstruction and breathlessness. Nurses are an integral part of healthcare delivery, and their role is important. A variety of healthcare professionals will learn about several life-threatening emergencies through the BLS program. It also exhibits instructions on safely, quickly, and effectively handling those emergencies, including CPR, using an AED, and relieving choking. All healthcare professionals must have comprehensive knowledge and skill about BLS. Hence, all healthcare institutions should emphasize training the students and interns for the BLS. However, awareness and performance skills regarding BLS are essential to assist in recovering and resuscitating the critical victim [12]. In this study, the total number of participants was 35 who received BLS training from PI. Of the total, 21 (60%) and 14 (40%) participants were female and male, respectively. Similarly, these variables were supported by a study conducted in western Uganda. In the Ugandan study, out of 42 study subjects, 65.6% were female & 34.4% were male participants [13]. In the current study, most participants were 28 (80%) in the age group of 20-30 years old. Likewise, these findings were also not so far from the study conducted at the teaching hospital of Nepal [14]. In this study large number 22 (62.9%) of the study subjects had a qualification of diploma in general nursing, only 2 (5.7%) had Post RN BSc Nursing qualification, and the rest of the participants were Generic BS Nursing degrees. On the other hand, a research study was conducted in a private hospital in Peshawar, Pakistan. In that study, more than 92.7% of the participants were diploma holders, and others were Bachelor's degrees in nursing [15]. The participants' pre-training knowledge in this research was 22 (62.9%) poor. It is in line with a research study of Dar-es-Salaam (Tanzania) accomplished by Ruhwanya *et al.*, found 84.4% of the study nurses have inadequate knowledge, which might be the same academic and professional characteristics [16]. A research study found 13%, 67%, and 20% poor, medium, and good knowledge, respectively [17]. This might be the study subjects' high professional and academic profile because in the nursing field, India is too good; most books are Indian. In the current research study, it is statistically proved that structured training sessions had a positive effect in terms of enhancement in audience knowledge (p-value = <0.001) and on mean knowledge score as well (p-value = < 0.001) [18]. A research study in Nepal also affirms that those participants who have already had ACLS/BLS certification achieved more scores as compared to those who haven't. Studies conducted in India and Nepal also showed a statistical association between BLS knowledge and training [18, 19]. Iranian research also disclosed that participants who were already certified in BLS training acquired a higher mean score and statistical difference between those who held periodic courses and those who did not [20]. Therefore, it is highly compulsory for all healthcare workers, particularly nurses, to have refresher courses to update their knowledge and achieve the best patient outcomes. A research study conducted in Palestine highlighted that qualified nurses had more knowledge than nursing students [21]. One reason could be hands-on practice; nurses regularly encounter such types of scenarios, so they have more knowledge than students. In our research study, 4 (11.4%) participants had no idea about CPR, and most participants had information about CPR gained through education sources and internet access. A

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research study was conducted in Egypt [22]. In this research, no participants had passed the scenario-based practical before the training as recommended by the AHA. On the other hand, an Ethiopian study revealed that 28.4% of the participants have good practical [23]. Moreover, the practice of BLS was statistically significant with attempted exposure to training and knowledge practice of BLS [24]. This claim was also proven by the current study as well. After training by PI, the participants' knowledge significantly increased along with scenario-based practice. The mean score of the knowledge increased considerably from 10.22 ± 2.22 to 16.4 ± 0.87 before and after the training, respectively. The BLS refresher course is mandatory to maintain proficiency in the skill. Hence, it is crucial that these healthcare professionals are familiar with BLS [25]. BLS training ought to be made periodically compulsory**.** All undergraduate and postgraduate training programs must include a component of BLS in their curricula because proper BLS performance improves patients' survival and outcomes after cardiac arrest. These hands-on training programs are necessary for improving CPR results. The provision of BLS training for groups of the proper size using reliable techniques in accordance with international and national norms is necessary for theoretical and practical training to succeed.

CONCLUSIONS

It is concluded that this study showed a statistical improvement in both theoretical and practical knowledge of BLS among nurses after structured interventions. However, before the intervention, nurses lack theoretical knowledge of BLS, leading to improper CPR performance.

Authors Contribution

Conceptualization: MI
Methodology: MI, JK
Formal analysis: R
Writing-review and editing: R, JK, TM

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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