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RESEARCH ARTICLE

A QUASI- EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF A TRAINING PROGRAMME ON KNOWLEDGE AND PRACTICE REGARDING PEDIATRIC BASIC LIFE SUPPORT (PBLs) BASED ON 2015 AHA GUIDELINES AMONG STUDENT NURSES IN A SELECTED COLLEGE OF NURSING, IN DELHI, INDIA

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ABSTRACT

Pediatric Basic life support is a level of medical care which is used for clients with life threatening illness or injury. In pediatric setup there are many pediatric emergencies like accidents, injuries, respiratory failure, sudden cardiac arrest and shock where the emergency professional health care team members performs a number of life saving techniques focused on the emergency care. Among which the Pediatric Cardio Pulmonary Resuscitation stands first and foremost in 'ABC' of hospital emergency care. Therefore training program on PBLs is required for students, to gain knowledge and improve skill. Quantitative approach was selected with pretest-posttest only design. 24 samples were chosen using total enumerative sampling technique. Data was collected from 24 third year GNM student nurses of Rufaidacollege of nursing, JamiaHamdard, Delhi from 20th September to 12th October, 2016. Training program was given to the study subjects and a structured questionnaire and structured checklist was used to collect data regarding the pediatric basic life support of the subjects before and after the administration. Findings revealed that the mean posttest score of the experimental group was greater than the mean posttest score of control group. Thus it is concluded that the training program on PBLs was effective for teaching and improving teenagers knowledge and skills in basic CPR among third year GNM student nurses.

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INTRODUCTION

Pediatric BLS refers to the provision of CPR, with no devices or with bag/mask ventilation or barrier devices, until advance life support (ALS) can be provided. It includes infants from birth to 1 year of age and children from 1-18 year of age. For best survival and quality of life, pediatric basic life support (BLS) should be a part of community effort that include prevention, basic CPR, prompt access to the emergency medical services (EMS) system and prompt pediatric advanced life support (PALS). Rapid and effective bystander CPR is associated with successful return of spontaneous circulation and neurologically intact survival in children. The greatest impact occurs in respiratory arrest, in which neurologically intact survival rates of less than 70% are possible and in ventricular fibrillation (VF), in which survival rates of 30% have been documented. Of all healthcare professionals, nurses are often the first to discover a patient of cardiopulmonary

arrest (CPA) in any part of the hospital, be it the "emergency" or the "in-patient" wards. Therefore, it is needless to say that their competency in cardiopulmonary resuscitation (CPR) is a critical factor in determining successful outcomes in patients who develop CPA. Every nurse and physician should be skilled in CPR because cardiac arrest, the sudden cessation of breathing, and adequate circulation of blood by the heart, may occur at any time or in any setting. Resuscitation measures are divided into two components, basic cardiac life support and advanced cardiac life support. The American Heart Association establishes the standards for CPR and is actively involved in teaching BCLS and ACLS to health professionals. The American Heart Association recommends that nurses and physicians working with patients be certified in BCLS and ACLS. Certification involves attending formal classes and passing cognitive and motor skill tests. CPR alone is not enough to save lives in most cardiac arrest. It is a vital link in the chain of survival that supports the victim until more advanced help is available. The chain of survival is composed of the following sequence: early activation of the EMS system, early CPR, early defibrillation and early advanced care.

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Need of the study

Cardio Pulmonary Resuscitation in children has been used in hospitals for approximately 40 years where the staff nurses are generally the first responders to cardiac arrest and initiate basic life support while waiting for the advanced cardiac life support team to arrive. Speed and competence of the first responder are factors contributing to the initial survival of a person following a cardiac arrest. The knowledge and practice of the staff nurse may influence the speed and level of involvement in the emergency situation (Mäkinen *et al.*, 2010).

Statement of the problem

A quasi- experimental study to assess the effectiveness of a training program on knowledge and practice regarding pediatric basic life support (PBLs) based on 2015 AHA guidelines among student nurses in a selected college of nursing, Delhi.

Objectives of the study

- To compare the knowledge of student nurses in the experimental group regarding PBLs before and after the administration of training program on PBLs.
- To compare the practices of student nurses in the experimental group regarding PBLs before and after the administration of training program on PBLs.
- To determine the satisfaction of student nurses related to training program on PBLs.

RESEARCH METHODOLOGY

Research approach: Quantitative (quasi-experimental) research approach

Research design : The pretest-posttest control group design

Setting of the study : Third year GNM student nurses of Rufaida college of nursing, JamiaHamdard, Delhi

Sampling technique : Total Enumerative Sampling Technique

Sampling size : 24 student nurses (15 each in both the groups)

Inclusion criteria

- Student nurses studying in selected college of Delhi and NCR.
- Student nurses willing to participate in study.
- Student nurses available or present at the time of the study.

Description of tool

A structured knowledge questionnaire, structured practice checklist and structured opinionnaire were used for the data collection in the study. The structured knowledge questionnaire was divided into two parts as under:

Part A – consist of 7 questions related to the background data of eligible students. **Part B** - consists of 30 knowledge items covering the following areas:

- Pediatric basic life support
- Airway
- Breathing
- Circulation

The structured practice checklist consists of 10 practice items based on the content on pediatric basic life support, 2015 AHA guidelines. The opinionnaire consists of 10 items, each with three alternatives responses as to a great extent, to some extent, and not at all. A score of 3, 2 and 1 was assigned to alternative responses respectively.

Procedure for data collection

Data was collected after obtaining formal permission from principal of Rufaida College of Nursing to conduct the final study. Final study was conducted during 20th Sept to 12th Oct 2016 at Rufaida College of Nursing, JamiaHamdard University, Hamdard Nagar, New Delhi. The sample of 24 student nurses studying GNM Nursing 3rd year were selected by total enumerative sampling technique. Data was collected in the following manner:

- Self -introduction and establishment of rapport with students.
- Provision of conducive environment for data collection.
- The sample screened based on inclusion criteria and then enrolled for the study.
- Taking informed consent from the participants for the research study-informing them about maintenance of confidentiality and their rights to withdraw at any point of time.
- The purpose of this study was explained to the students.
- Collection of data from students.

Data analysis

Descriptive and inferential statistics for data analysis are as follows:

- Background data analysis by using frequency and percentage to described the demographic characteristics of the students.
- Mean, median and standard deviation of the pre-test and post- test of knowledge and practice scores.
- paired't'-test values for same group to find difference between the knowledge and practice scores.
- upaired't'-test values for different group to find difference between the knowledge and practice scores.
- Data related to satisfaction of PBLs analyzed using descriptive statistics i.e frequency, percentage, mean and standard deviation.

Major findings

I. Findings related to demographic characteristics of the sample subjects

- Based on the age of student nurses the majority of subjects i.e. experimental group 6(50%) and control group 7(58.3%) were in the age group of 20 and above years.

- Based on the sex of the students, 12(100%) female students were there in both experimental and control group.
- Majority of subjects, 9(75%) and 10(83.3%) lived in nuclear family in both experimental and control group.
- Maximum number, 10(83.3%) and 12(100%) of sample subjects had place of residence in urban area, in experimental and control group.
- Majority of subjects, 5(41.6%) belong to Hindu religion, 4(33.3%) belong to Christian religion and 3(25%) belong to Muslim religion in experimental group and 7(58.3%) belong to Muslim religion, 4(33.3%) belong to Christian religion and 1(8.3%) belong to Hindu religion in control group.
- Regarding sources of information about PBLs, 8(66.6%) had information from college, 4(33.3%) had information from social media and 8(66.6%) had information from college; 1(8.3%) had information from social media and 3(25%) had no previous information about PBLs in control group.
- Regarding percentage in previous academic year; 5(41.6%) experimental group and 6(50%) control group obtained 60-70% in previous academic year.

II. Findings related to knowledge scores regarding Pediatric Basic Life Support

- The mean pre-test knowledge scores of control group (6.6) were higher than the mean pre-test knowledge scores of experimental group (6.25) with a mean difference of 0.35. it was not found to be statistically significant as evidence from 't' value of 0.43 for df 22 at 0.05 level of significance. This indicates that initially student nurses in both the groups i.e. control and experimental group did not differ in their level of knowledge.
- The mean post-test knowledge scores (23) of experimental group was higher than the mean pre-test knowledge scores (6.25) with a mean difference of 16.75. The 't' value of 14.0 for df 11 was found to be statistically significant at 0.05 level of significance.
- The mean post-test knowledge scores (6.9) of control group was higher than their mean pre-test knowledge scores (6.6) with a mean difference of 0.3. the obtained mean difference was found to be statistically significant, as evident from 't' value of 2.75 for df 11 at 0.05 level of significance.
- The mean post-test knowledge scores (23) of experimental group were higher than the mean post-test knowledge scores (6.9) of control group with a mean difference of 16.1. the obtained mean difference was found to be statistically significant as evident from the 't' value 11.0 for df 22, at 0.05 level of significance.

III. Findings related to practice scores of student nurses regarding PBLs

- The mean pre-test practice scores of experimental group (2.9) were higher than the mean pre-test practice scores of control group (2.5) with a mean difference 0.4. it was not found to be statistically significant as evident from the 't' value of 0.69 for df 22 at 0.05 level of significance. This indicates that initially student nurses

in both the group i.e. experimental and control group, did not differ in their level of knowledge.

- The mean post-test practice scores (7.8) of experimental group was higher than their mean pre-test practice scores(2.9) with a mean difference of 4.9. the 't' value of 14.62 for df 11 was found to be statistically significant at 0.05 level of significance.
- The mean post-test practice score (2.9) of control group was higher than their mean pre-test practice score (2.5) with a mean difference of 0.4. the 't' value of 2.86 for df 11 was found to be statistically significant at 0.05 level of significance.
- The mean post-test practice score (7.8) of experimental group was higher than the mean post-test practice score (2.9) of control group with a mean difference of 4.4. this obtained mean difference was found to be statistically significant as evident from the 't' value of 9.84 for df 22 at 0.05 level of significance.
- The frequency and percentage distribution shows that, in experimental group 12(100%) of student nurses had adequate knowledge and 12(100%) had inadequate knowledge in control group in post-test knowledge scores. In experimental group 12(100%) of student nurses were skilled and 12(100%) were unskilled in control group in post-test practice scores.

IV. Findings related to the satisfaction of PBLs training program based on 2015 AHA Guidelines

- Majority (100%) of student nurses expressed their satisfaction of PBLs as "to great extent", 91.6% "to some extent" and 8.3% "not at all". This indicates the high level of satisfaction of PBLs by student nurses.

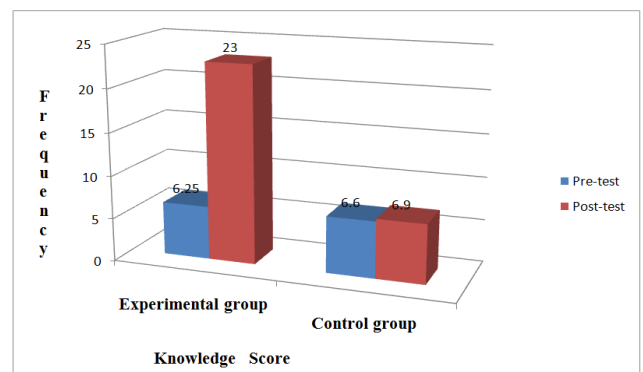


Figure 1. Bar Diagram Showing Percentage Distribution of Student Nurses According to Knowledge Scores in Experimental and Control group

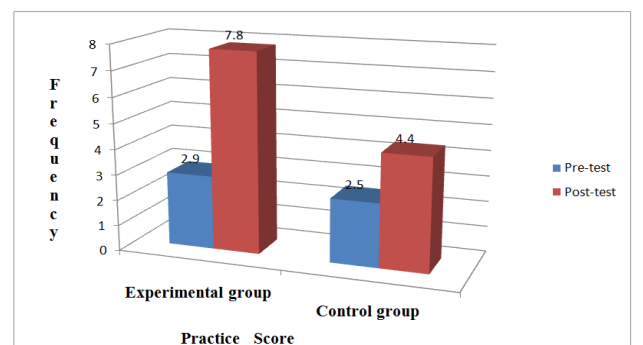


Figure 2. Bar Diagram Showing Percentage Distribution of Student Nurses According to Practice Scores in Experimental and Control group

Conclusion drawn from the study

The following conclusions were drawn on the basis of the findings of the study.

- Majority of student nurses have average knowledge and practice regarding PBLs in pre-test.
- Training program on PBLs based on 2015 AHA Guidelines was highly effective in increasing the knowledge score of student nurses in experimental group regarding PBLs.
- Training program on PBLs based on 2015 AHA Guidelines was highly effective in increasing the practice score of student nurses in experimental group regarding PBLs.
- Training program on PBLs based on 2015 AHA Guidelines was accepted by the student nurses in experimental group.

DISCUSSION

The findings of the present study indicates that the training programme on PBLs as 2015 AHA Guidelines, is more effective in enhancing the knowledge and practice of third year GNM nursing students regarding PBLs. Mean pretest knowledge and practice scores of student nurses were not having much difference both in control and experimental group which indicates that initially they did not differ in their level of critical thinking ability. It is suggested that after the administration of training program the student nurses belonging to the experimental group obtained significantly higher mean posttest knowledge and practice scores than the mean posttest knowledge and practice scores of control group. The findings of the study are congruent extent consistent with the study conducted by Hamilton R *et al.* conducted a study on examining the knowledge of staff nurses and factors that enhance the skills during and after CPR training 105 first grade nurses and 157 end grade nurses were identified who met the criteria for the final training programme on CPR at Narham University hospital Nits trust at UK. Out of which 40% of them found to have lack of competence and awareness on CPR guide lines which concludes that training and video self-instruction has been recommended to improve the level of knowledge and competence in resuscitation after CPR training, 75% of staff nurses became equipped and skilled in performing CPR. The findings of the present study are congruent with the study done by, Jhuma Shankar, Nandini Vijaykanthi *et al.* conducted a quasi- experimental study in the pediatric emergency and ICU of a tertiary care training hospital between January and March 2011. They assessed the baseline knowledge and skills of nursing staff (in-service nurses) and final year undergraduate nursing students (pre service nurses) using a validated questionnaire and a skill checklist, respectively. A total of 74 participants—28 in-service and 46 pre service professionals—were enrolled. At initial assessment, in-service nurses were found to have in significant higher mean knowledge scores (6.6 versus 5.8, $p=0.08$) while the pre service nurses had significantly higher skill scores (6.5 versus 3.2, <0.001). Immediately after training, the scores improved in both groups. At 6 weeks however, observed a non -uniform decline in performance in both groups—in-service nurses performing better in knowledge test (10.5 versus 9.1, $p=0.01$) and the pre service nurses performing better in skill test (9.8 versus 7.4, $p<0.001$). Thus, knowledge and skills of in-service

and pre service nurses in pediatric CPR improved with training. The findings is supported by a study conducted by Sumithra (2005) on knowledge and practice of staff nurses regarding neonatal resuscitation. Study concluded that staff nurses had inadequate knowledge (43.3%) and poor practice (60.68%) about newborn resuscitation. After giving training program, the knowledge and practice is increased by their previous scores. The findings of the present study are congruent with the study conducted regarding retention, targeting the young in CPR skills training in USA (2009). The prospective investigation was conducted and set out to determine whether young students have the physical and cognitive skills to implement CPR. As the investigator demonstrated, students as young as 9 years are able to effectively learn CPR skills. The students aged 9 to 10 years could compress the chest to the depth recommend by the guidelines, but 45% of students aged 13 to 14 years old could. Studies also have found that with retraining, CPR performance can improve in school aged children and distributing CPR training kits to students aged 12 to 14 years resulted in another 2.5 persons trained per students.

Nursing Implication

The findings of the present study have several implications in nursing education, nursing practice, nursing administration and nursing research.

Nursing Education

- PBLs uses theoretically based and empirically grounded strategies for ensuring effectiveness of small group working independently in classes with high student to faculty ratio. It is an effective teaching strategy for large group of students.
- Nursing education should emphasize on preparing prospective student nurses to gain knowledge and practice regarding PBLs by using various methods of educational technology.
- Nursing faculty should be given in-service education to update their knowledge regarding PBLs and further skills and abilities in identifying the learning need of nurses and planning for appropriate interventions.
- As nurse educator, she should introduce the PBLs training programme in curriculum separately, which should be mandatory; so that student nurses are well equipped with knowledge and practice regarding PBLs, in order to be skilled before working in hospital setting.

Nursing Practice

- The result of this study will help student nurses to understand PBLs procedure and its utilization when they will introduce in hospital setting; and when sick baby arrives.
- Staff nurses working in the pediatric ward should be equipped with the knowledge regarding PBLs practice.
- PBLs training program can be applied by recruiting and training practicing to serve as mentors and role – models for co-nurses.

Nursing Administration

- The in-service education programs for the staff nurses is of utmost important in today's scenario, where new protocols of managing various emergencies keep

changing with new developments in nursing management.

- PBLs can be initiated for the staff development program.
- PBLs can be used as a regular teaching strategy in the in-service education program, to update the knowledge of skilled staff nurses.
- Necessary administrative support has to be provided to conduct health workshops and seminars in the hospital and nursing colleges.

Nursing Research

- Findings of the study will act as a catalyst to carry out more extensive research on large population sample and in other setting.
- A study can be done to assess the effectiveness of PBLs amongst staff nurses or students belonging to various faculties.
- Comparison of different teaching strategies with PBLs can be assessed.
- Further research can be conducted regarding the attitude and practices of student nurses on large scale on PBLs.
- Through publication of research findings awareness and motivation can be promoted by nurse researcher.

Limitations

The size of sample was only 24 student nurses; hence it was difficult to make a broad generalization.

Recommendations

- Further studies can be conducted on large scale to provide better picture of knowledge and practice regarding PBLs.
- The instrument used to assess the knowledge and practice of staff nurses regarding PBLs can further developed and field tested for standardizing.
- There should be in-service workshop and seminar to enhance the student nurses knowledge and practice regarding PBLs.
- Similar study can be replicated using different teaching strategies viz. computer simulation, video films, information booklet, pamphlet etc.
- A comparative study can be conducted on subjects from different college.
- PBLs can be utilized in other area of nursing practice.

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