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Effectiveness of child cardio pulmonary resuscitation (CPR) training programme in terms of practice retention among nursing students

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Abstract
Background: Cardiopulmonary failure is combination of respiratory failure and shock immediate resuscitation is necessary in order to achieve conscious survival for persons who have lost airway or pulses. Applying resuscitation procedure correctly is very important in saving the life of the individual.
Objectives: To assess practice regarding CPR of nursing students before and after administration of CPR training programme
Methods: A Quantitative research approach with time series design was used. 72 B.Sc. Nursing students were selected as a sample in the study using consecutive sampling technique. Observation Checklist for Evaluating Nursing Student's Practice through OSCE for CPR was used. The training programme regarding CPR was prepared by researcher which was confined to child CPR as per AHA 2010 guidelines. The Nursing Students were divided into six groups consisting twelve students per group. The pre-test was conducted followed by BLS training programme and the post assessment-I was assessed immediately after the completion of training programme. And on 28th day, each group had undergone post assessment- II knowledge.
Results: Findings of the study indicate that training programme was effective in enhancing the practice as the findings indicate that the mean of the post-test-I practice score (9.03) was higher by pre-test knowledge score which was (1.25). There was poor retention of CPR practice among nursing students as there was a decrease in the than post-test-II practice score (6.06) than the post test-I practice score (9.03).
Conclusion: CPR training programme was effective in enhancing the practice of Nursing Students regarding CPR and there was poor retention of CPR practice among nursing students.

Keywords: Effectiveness, training programme, practice, retention, CPR

1. Introduction
Cardiac arrest in infants and children does not usually result from a primary cardiac cause in contrary to adults. More often it is the terminal result of progressive respiratory failure or shock, also called an asphyxial arrest. Asphyxia begins with a variable period of systemic hypoxemia, hypercapnea, and acidosis, progresses to bradycardia and hypotension, and culminates with cardiac arrest [1].
Resuscitation is the art of restoring life or consciousness of one apparently dead [2]. Doctors, nursing and layperson should know about the BLS, as they are frequently encountering life threatening emergencies. The American Heart Association has adopted, supported and helped develop the concept of emergency cardiovascular care (ECC) systems for many years. Knowledge and practice of cardiopulmonary resuscitation among the nursing personnel working in different working units is absolutely necessary and enables to give professional life-saving assistance while the nursing process conditions patient's recovery and high quality of life. In spite of a wide range of nursing duties performed on different kinds of patient, nurses still express readiness to gain knowledge and practice in the form of standards and procedures related lifesaving conditions [3]
The deficiencies in CPR quality for both out of hospital and in hospital cardiac arrest. Practice of BLS amongst medical and nursing students has always been a neglected subject [4]. Cardiac Life Support training is a critical component of undergraduate teaching. The training helps to develop an organized thinking process in the students [5].

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The deterioration in knowledge can occur within two weeks of initial BLS training which is evidenced by inability of knowledge retention among physicians, nurses, and the lay public [6].

2. Methodology
This study was conducted in a nursing college with the approval of ethical committee of the university. A quasi experimental (time series test) design was used to examine the effectiveness of CPR training programme on practice of Nursing students. The study participants comprised of 72 B.Sc. Nursing IV year students and six groups of twelve students each were made by using consecutive sampling technique. B.Sc. Nursing students who were willing to participate and present at the period of data collection were included in the study. Written informed consent was obtained from all the study participants before starting the study. The study was conducted from December 2015 and January 2016.

Assessment tool used was Observation Checklist for Evaluating Nursing Student's Practice through OSCE for CPR. Practice was assessed initially, immediately after training and again on 28 day by a observational checklist comprised of 10 steps (each correct step was given 1 mark and 0 for wrong step) validated by 9 experts independently. The nursing students who scored 9 or more than 9 marks were termed as "competent" and less than 8 marks were termed as "non-competent" by researcher. The training programme regarding CPR was prepared by researcher which was confined to child CPR as per AHA 2010 guidelines. The training programme included, video based teachings, simulation technique and hands on session regarding CPR.

The Nursing Students were divided into six groups consisting twelve students per group. On the first day, pre-test to assess practice regarding CPR was conducted and on day-3, 6, 9, 12, 15 and 18 the training programme was given to group-1, 2, 3, 4 ,5 and 6 respectively and on the same day of training programme after the completion of training programme the post assessment-I was assessed. After the completion of CPR training programme for all the groups, on 28th day, each group had undergone post assessment- II practice regarding CPR, respectively as per their pre assessment dates which was on day- 31, 34, 37, 40, 43 and 46.

3. Result
A total of 72 nursing students were included in this study. The Nursing Students (100%) were in the age group of 20-23 years. Majority of subjects (73.6%) were female and (26.4%) were male. Most of the subjects (84.7) had previous knowledge about BLS.

Table 1: Frequency and percentage distribution of nursing students in terms of level of knowledge scores of pre-test, post-test-I and post-test-II regarding CPR training programme of nursing students N=72

Level of Knowledge	Range of Scores	Pre Test		Post Test-I		Post Test-II
		f	(%)	f	(%)	f (%)
Competent	9-10	0	0	59	81.95	5 6.94
Non Competent	1-8	72	100	13	18.05	67 93.06

Maximum Score= 10
Minimum Score= 00

The data presented in table 1 showed that in pre-test all the Nursing Students (100%) were non-competent in terms of practice regarding CPR. Whereas in post-test-I after administration of the CPR training programme, majority of nursing students that was 81.95% were competent in terms of practice regarding CPR only 15.3% were non-competent in terms of practice regarding CPR but only 6.94% nursing students were competent in Post Test-II which happens to be on 28th day after providing CPR training programme and the majority of nursing students were non competent 93.06%.

Table 2: Range, mean, standard deviation and median of knowledge score of pre-test, post-test-I and post-test-II regarding CPR training programme of nursing students N=72

Knowledge Test	Range	Mean± SD	Median
Pre Test	0-4	1.25±1.590	1.00
Post Test –I	6-10	9.03±1.113	9.00
Post Test –II	3-10	6.06±1.600	7.00

Maximum Score= 10
Minimum Score= 00

The data presented in table: 2 showed that the range of post-test-I practice score (6-10) was higher than the range of post-test-II which was (3-10) but it was higher than the pre-test knowledge score (0-4). The findings indicate that the mean of the post-test-I practice score (9.03±1.113) was higher than post-test-II practice score (6.06±1.600) followed by pre-test practice score which was (1.25±1.590). The median of pre-test practice score was 1 whereas the median of the post-test-I practice score was 9 and post-test-II practice score was 7.

Table 3: Mean, mean difference, standard deviation, standard error mean "t" value of pre-test and post-test-I practice score of nursing student regarding CPR training N=72

Score	Mean	Mean D	SDD	S. EMD	't'	p value
Pre test	1.25					
Post Test-1	9.03	7.78	1.840	0. 217	35.863	0.01*
Post Test-1	9.03					

t (71) =1.98 * significant (*p*<0.05)

The data presented in table 3 depicted that mean difference between pre-test and post-test- I practice score was (7.78), the pre-test mean practice score was (1.25) and post-test-I test mean practice score was (9.03) and the computed t value was (35.863). The calculated t value (35.863) was found to be statistically significant at 0.05 level of significance and it indicated that there was a significant increase in the practice of nursing students regarding CPR.

Table 4: Mean, mean difference, standard deviation, standard error mean 't' value of post-test-I and post-test-II CPR practice score of nursing student N=72

Score	Mean	Mean $_D$	SD$_D$	S.E$_{MD}$	't'	p value
Post Test-I	9.03	2.97	1.768	0..208	14.264*	0.01*
Post Test-II	6.06					

t (71)=1.98 * significant ($p \leq 0.05$)

The data presented in table 4 depicted that mean difference between post-test-I and post-test-II practice score was (2.97), the post test-I mean practice score was (9.03) and post-test-II test mean practice score was (6.06) and the computed t value was (14.264). The calculated t value (19.957) was found to be statistically significant at 0.05 level of significance so there was a significant decrease in the practice of nursing students regarding CPR on 28th day of CPR training programme.

4. Discussion
In the present study was consistent with Nithin Philip where that the majority (71.70%) of sample were females and only 28.30% were males. Majority (83.3%) of sample belongs to age group 21-25 years whereas 16.7% belongs to age group 26 years and above. And in the present study most of the participant were female (73.6%) and only (26.4%) were male students. In the present study all the students (100%) of the students were in the age group of 20-23.6

The mean post-test practice score (9.03) of CPR was higher than pre-test practice score (1.25) which is consistent with P. P. Saramma *et al* conducted Assessment of long term impact of formal certified cardiopulmonary resuscitation training program among nurses where the Post-test performance score was 40.39 and Pertest performance score was 26.36.

The result of the present study had shown that the post-test practice score (9.03) of CPR was higher than pre-test practice score (1.25) and the calculated t value for the BLS practice was (35.863) which was statistically significant at 0.05 level of significance. The findings are consistent with the findings of Rashmi Goswami *et al* conducted a quasi-experimental study to evaluate the effectiveness of Training Program on Knowledge and Practices Regarding Basic Life Support (BLS) among nursing students at selected Nursing College, Mullana, Haryana, findings showed and post-test mean practice score (23.00) was higher than the pre-test mean practice score was (10.31) and the calculated t value for the practice was (19.83) which was statistically significant at 0.05 level of significance.8

The study findings were reconcilable with the finding of Jhuma Sankar *et al* who conducted a repeated measure quasi experimental study to determine the effectiveness of Pediatric Cardiopulmonary Resuscitation training programme regarding on pre service at a selected hospital in New Delhi. In the present study the skills were checked which shows that the pre-test skill mean score was 3.2 which increased to 10.7 after providing training programme which further decreased to 7.4 in second post assessment after 6 weeks, and in the present study the pre-test practice mean score was 1.25, the first post-test practice score was 9.03 which was significantly increased after providing training programme which reduced to 6.06 in second post assessment after 4 weeks.5

5. Conclusion
The mean post-test practice-I score was higher than the mean pre-test practice score and mean post-test practice-II score was lower than the mean post-test-I practice score Thus, the CPR training programme was effective in enhancing the practice of Nursing Students regarding CPR. There was significant decrease in the knowledge among of nursing students regarding CPR after 28 days of administration of CPR raining programme so there was poor retention of CPR knowledge among nursing students.

6. Limitations
The reinforcement was not given regarding CPR to the nursing students who were non- competent after the training programme.

7. References
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