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A Study to Determine the Effectiveness of Basic Life Support Training on Knowledge of Life Saving Skills among College Students in Selected Colleges at Jaipur for Degree Students

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Abstract: ***A one group pre-test post-test pre experimental approach was adopted. Cardiopulmonary resuscitation (CPR) is one of the most evolving areas of saving actions that improve the survival rates following cardiac arrest and educating to college students can play a dynamic role in case of emergency situations in the society. The study was therefore undertaken to find out the knowledge and skills of undergraduate college students after training on BLS. AIM of the study: To improve knowledge & skills among college students about basic life support and to improve the survival rates following cardiac arrest. Objective of the Study: To assess the pre & post training knowledge on basic life support for life saving among college students. Material & methods: A study was conducted on 1500 student participants studying in selected colleges of Jaipur, to fulfill the appropriately calculated minimum sample size of 1454 .The study period from October 2011 to Sept. 2016. The conceptual frame work for the study was developed based on 'general system theory' by Bertanlanffy. The research hypothesis was stated as H1 : The mean post-test knowledge & skill score of the college students will be significantly higher than the mean pre-test knowledge & skill score regarding training on BLS. In view of the nature of the problem and to accomplish objective of the study, a training programme was prepared on BLS technique for degree students. A structured closed ended questionnaire was prepared to assess the knowledge level. The content validity of the tool and training schedule was established in consultation with the guide and experts in the field of Nursing, Medicine and Education. Reliability (r = 0.88) of the tool was tested by split half technique and Karlpearson Co-efficient correlation formula. A pilot study was conducted with one hundred fifty students to refine the methodology and find the feasibility of the study. Further effectiveness of training programme was tested by inferential statistics using paired 't' test. The difference between pre-test and post-test knowledge scores of Degree students on BLS technique was found to be very highly significant. The overall findings of the study reveal that there is significant increase in the knowledge of Degree students regarding BLS training. The training was found to be an effective strategy in increasing the knowledge & Skills of Degree students regarding BLS Training. Results: Total 1500 participants included in the study and grouped in three categories according to their knowledge scores as poor, good and excellent scores obtained in pre and post training assessment among them there were 883(58.8%).participants in the poor category who all improved after training as in the post test results none of the person found in poor category. There were only eight participant in the excellent score category before intervention which increased to 1188(79.2%) in excellent category of knowledge after training intervention. There was mean knowledge score of 9.3 with SD3.9 before the training on BLS which increased to mean score of 25.0 with SD 2.4 the skills score was 7.5 with SD2.78 before training which increased to 21.6 with SD 3.8 after training both these difference in knowledge. (t=34.4; p<0.001and t=39.1; p<0.001 respectively). The participants were grouped in three categories according to their skills scores in to poor, good and excellent scores obtained in pre-training. Initially there were 1259(83.9%) in the poor category, who all improved after training as seen in the post training observation results showing only 32(2.1%) persons in poor category. There was not a single student in the excellent category of score before intervention which increased to 665 (44.3%) in excellent category of skills. However, It was revealed that knowledge scores before training for participants received prior information through mass media (p=0.048) were more than participants 'not received any information'.. This meant that information level has impact on knowledge. Percentage of effectiveness (93%) was found in the item 'the rate of compression is 100 per min. in 'steps and technique of CPR' whereas highest percentage of (89.26%) of the effectiveness was found in the item 'the recovery position after the CPR is place the victim on his or her side' in 'Post resuscitation care". Interpretation & Conclusion: The analysis of data revealed that, the post assessment of knowledge score significant higher than pre-test score at p<0.05 level of subjects. The investigator concluded that the training on BLS was good method of conveying information by demonstration. Therefore planned teaching and demonstration is logical solution for improving knowledge, about CPR in cases of emergency life saving skills in the particular group of the society.***

Keywords: Training, knowledge, college students, BLS & CPR

1. Introduction

Cardiopulmonary Resuscitation is a technique of Basic Life Support for the purpose of oxygenating the brain and heart until appropriate definitive medical treatment can restore the normal heart and ventilatory actions. Cardiopulmonary Resuscitation more commonly known as CPR is a Basic Life Support procedure for people whose heart and lungs have ceased to function effectively. (Gerald M. Dwarkin, 1999)[5].

Cardiovascular diseases remain the most common cause of death in developed countries and are increasing in number in developing countries. In USA 48% of all the deaths (1994) were due to cardio vascular diseases. In 1997 the death rate was 35%, but 68% of these deaths occurred before reaching the hospital. Each year one million people in US suffer from acute myocardial infarction, out of which approximately 700,000 die. Of these 350,000 fatalities occur outside the hospital, usually within two hours after the onset of symptoms of heart disorder. In India in 1994 the annual death rate due to cardiovascular

diseases was 18%. In 2002 the death rate increased to 26% (National Centre of Health Statistics, WHO, 2002)[6].
In the world an estimation of 3.5 million die every year not from disease but from injuries that are sustained through accidents and violence. More or less same number of people become disabled (WHO, 1998)[7].

According to Health Information India (1998) the rate of death due to accidents and injuries in 1992 was 5.9 %(953/16,143) and it became Seven Percent (1,269/18,262) by 1996. Distribution of death rate in relation to age shows that the maximum number of deaths occurring due to accidents and injuries (22.7%) occur in the age group of 16-24 years[8].

Approximately 1,00,000 people die annually as a result of accidents such as drowning, suffocation, electrocution, drug overdose, automobile accidents, fires and poisoning. Medical research and practical experience confirms that a significant number of these fatalities estimated at approximately 20% could have been prevented if prompt and proper Cardiopulmonary Resuscitation has been applied on the scene (American Heart Association – 2001)[9].

Majority of the accidents are preventable, for which education on life saving measures plays an important role. If accident is a disease, education is its vaccine (Park, 2000). Majority of the deaths due to accidents occur during the transportation of the victim to hospital. Many deaths can be averted and disability can be limited by providing CPR education services before taking the victim to hospital[10].

National Academy of Sciences and National Council in 2002 emphasized to rediscover the value of teaching CPR in colleges. In 1998, American Health Association began a large scale evaluation of CPR in colleges in the United States. Experts at the International Guidelines 2000 Conference strongly recommended development of CPR programs in colleges to ensure widespread learning of CPR and other BLS skills, because 70 - 80% of cardiac arrests occur at home(NAS-2002)[11].

Cardiopulmonary Resuscitation is the first assistance given to the collapsed person and is aimed at the prevention of further harm. It is the temporary treatment given at the site of accident and by a skilled person before the subject is under the charge of a physician. The correct CPR measures can reduce suffering, be instrumental in speeding up subsequent recovery, prevent permanent disability and even save life. First few minutes following injury is called the golden time. Many complications and events that occur during this period, can convert a simple injury to death if unattended. It is important to act and react during the golden time to reduce mortality and morbidity. It is very essential that every responsible person or citizen who comes across an accident victim should be aware of essential initial help the victim may need right at the site till he is transferred to the hospital [12].

World Health Organization (WHO) Technical Report Series (1999) showed that Colleges have the potential to provide an excellent base for large scale programming and there is a need to strengthen the college as a setting for health intervention. Colleges can provide many services to young people in addition to formal education, such as health education, skill development in the areas such as life saving skills[13].

A college is an appropriate setting for the introduction of teaching and training of students on life saving CPR skill as it offers access to young adults on a large scale. It is economically efficient and there are possibilities for short term and long-term evaluation.

The college students belong to these groups who have enthusiasm in learning and excellence in performing in new things. When a competent student uses correct technique of CPR, large number of clients can be saved. Emergency resuscitation is the first hand management done for critically ill and students need to be knowledgeable in all aspects to revive the client who is struggling for life. Competence and confidence in CPR are the corner stone's of emergency management of critically ill.

The researcher considered the training of CPR for degree students as one among the group comprising of the general public, lay people and non medical professionals, which is appropriate to carry out the research. The best age for learning BLS is college age. Young people are more easily motivated to learn the skills and are generally easier to teach. They are also more opting to retain psychomotor skills longer. Strategically, the pay off of the educational investment is considerably higher with young learner, since they remain potential lifesavers for many more years.

Health teaching is an integral part of nursing and it emphasis a scientific attitude towards health which is very important to modern healthy living (Reena George, 2003).Planned health teaching of the masses is one of the most effective means of health promotion. Hence the investigator felt the need to conduct a Planned Teaching programme regarding CPR and also to evaluate the effectiveness of a teaching programme and contribute to the general health of the nation[14].

2. Literature Survey

A research with the intention of testing six null hypothesis regarding the retention of knowledge of basic cardiopulmonary resuscitation of general public. The hypothesis were formulated from the broader aims of the research, which were to investigate into conclusion reacted by other researches, highlighting the speed with which retention of cardiopulmonary resuscitation skill and knowledge deteriorate and to investigate the need for regular updating in cardiopulmonary resuscitation. The research which was quasi experimental in nature and 19 undergraduate students participated in it.The largest, greatest guidelines issued by the resuscitation council were used, which also aided in the design and use of two research tools, normally an eight point skill testing observation tool and a 26 point knowledge testing questionnaire. The finding of the study reflects similar

results to the previous research undertaken and suggested that retention not used or updated regularly. This research therefore supported the importance of periodic cardiopulmonary resuscitation refresher course on a regular basis (Broomfield, 2004)[31].

A study conducted among 783 college students in Bombay between 18-21 years to assess the knowledge about BLS-CPR knowledge was assumed with the help of pre-tested multiple choice type of questionnaire. Study revealed that only 13% of students knew that CPR is the life saving measure, whereas 87% has never heard about CPR. Researcher strongly recommend the health professional to provide education to the college students which cover the major portion of the general population (Velhal G.D),et al,2004[32].

A study examined basic aspects of knowledge and attitude towards resuscitation in university school students of urban community in New Zealand. Methods using a telephone survey, they questioned 400 subjects aged over 17 years. On their prior training, knowledge and attitude towards CPR of these, 12% had been taught during the previous year, and 63% over five years previously. Older subjects were less likely to have learn CPR than younger subjects. 73% of those surveyed desired to know more about resuscitation. Overall knowledge was highest for those taught in the previous year, and for those persons aged between 26 and 45 years. They concluded that, although attitudes of the University School students toward CPR are positive, knowledge and skill relating to basic CPR is poor. This suggests that to increase institutional CPR education programs strategies have limited efficacy (Larsen P,Pearson J, Galletly D, 2004)[33].

The faculty of Medicine and Health Sciences of the United Arab Emirates University has been offering formal training in basic life skills to graduate students since 1989. The aim of this study was to determine the efficacy of the program and the extent to which it provides students with confidence to perform skills on their own. After training 165 of 180 male and female students comprising 3 cohorts (91.7% response rate) completed a self-administered anonymous questionnaire. The questionnaire contained open-ended and Likert-type questions. The authors analyzed assessment outcomes and associated between self perceived levels of confidence and ability to practice. The results suggest that the program provides students with sound basic knowledge and adequate practical skills in CPR (Das M, Elzubeir M, 2001)[34].

A study was conducted to test the feasibility of teaching secondary school students to perform CPR according to American Heart Association (AHA) standards. Students were instructed by their usual teachers who received a special educational program in preparation. Both immediate learning and retention of the students after months were evaluated using a practical and a written test. Fifty five percent of the practice group in the initial test and 31 percent in the retention study were able to perform the skills. The study suggests that, it is possible to train secondary school students to perform the ABC's of CPR if they have an opportunity to practice these skills (Venderschmidt H, Burnap, T. K. Thwaites, J. K., 2003)[35].

A study conducted with the aims that, resuscitation skill such as CPR are taught as an optional component of the New Zealand graduate school curriculum. At the end of the 2001 school year, they surveyed by questionnaire, 205 school students in New Zealand asking which schools taught CPR skills during 2001. This survey indicates that the majority of primary schools are not teaching CPR skill, or other life saving first aid, and that the majority of secondary schools are teaching these subjects as optional, taught only to a small proportion of students, if New Zealand has to achieve widespread academical CPR knowledge. It is suggested resuscitation training must become a compulsory, rather than optional component of the school curriculum (Lafferty C., Larsen P. D., Galletly D., 2003)[36].

A research program is aimed at teaching basic cardiopulmonary resuscitation to teenagers within university school age between 18-23 years. To assess the university school students learning, they were administered a 20-question test before and after the program. Epidemiological characteristics and students opinion before process, the mean mark (over 20 points) was 8.5 (2.4). After process, marks improved upto 13.5(3.2) ($p<0.001$). Participants who had previously taken a first-aid course or were in the course obtained significantly better marks than the rest. These differences disappeared after process completion. Students rated the theoretical parts as 7.9(1.1) the skill part as 8.2(1.2) study concluded that is an useful tool for teaching and improving young adults knowledge and skills in CPR (Miro O. et al., 2002)[37].

3. Methods / Approach

A before and after quasi experimental interventional study was carried out on the same group of participants' i.e. Degree college students at Stani Memorial College, Parishkar Degree College & St.Wilfred college at Jaipur, State of Rajasthan, from October 2010 to October 2015. Location of Jaipur is shown in the state of Rajasthan in the map of India.

Determination of Sample Size: Total 1454 subjects were studied. Since the study design was before and after type, considering chance of non-response due to any reason, more subjects were needed to be included than the calculated minimum sample size, therefore all the available 1500 subjects included for the study.

Sample and Sampling Technique

Sample consists of a sub set of a population, selected to participate in research study. Sampling refers to process of selecting a portion of population to represent the entire population (Polit and Hungler, 1999)[62].

The sample of the study comprised of 1500 students studying regularly in B.A. & B.Com degree courses in

selected colleges**.** So all of them were decided to be included in the study.

All student participants were contacted and plan & purpose of the study was explained to them. A written informed consent was obtained from all the willing students. Enrollment of all the students in the study was undertaken.

Target Population: Population means all the possible elements that could be included in research. (Dane, 1990)[63].

In the present study, the participants of the present study comprised of students studying in degree colleges (B.A. & B.Com courses) who were studying during July 2011 to June 2014 in St.wilfred, Parishkar & Stani memorial Colleges, Jaipur.

Setting for the study

This study was conducted in 3 degree Colleges located in Jaipur City i.e.

i) St.Wilfred PG College.
ii) Stani Memorial College.
iii) Parishakar PG College

These are co-education colleges with a total strength of 500 degree students each, imparting B.A. and B.Com courses. These colleges provide educational opportunities to all categories of students irrespective of their caste, creed and socio-economic status. These colleges provide Bachelor of Arts and Commerce education.

Variables Under Study

Within the text of quantitative research, investigation concepts are usually referred to as variable. It is something that varies (Polit & Hungler, 1999).[62]

Independent Variable (IV)

Independent variable is the variable that stands alone and does not depend on any other. It is the presumed cause of action (Treece and Treece, 1988)[64].

In this study, the planned training programme on BLS technique was the independent variable

Dependent Variables (DV)

Dependent variable is the effect of action of the independent variable and cannot exist by itself (Treece and Treece, 1988)[64].
In this study dependent variables were:

- Performance in Pre-test knowledge questionnaire on BLS & observation check list for pre- skills.
- Performance in Post-test knowledge questionnaire and observation check list for post skills.

Attributed Variables (AV)

Name, age, sex, any training or information received on CPR technique in the past, educational stream, Religion, caste, Gross family income & per capita income.

Data Collection:

Selection and Development of Instrument

Data collection tool are the instruments i.e. the written device that a researcher uses to collect data eg. Questionnaire, tests, observation schedule etc. (Polit and Hungler, 1998)[62].

In this study, the researcher used tool to collect the relevant data.

- They were structured knowledge questionnaire on CPR technique and observation.
- Checklist for assessing the skills concerning CPR technique.

Development of the Tool

In this study, a self-administered questionnaire was prepared to assess the knowledge on basic life support by CPR technique for Adult and observation checklist regarding the skill for Adult 1 rescuer CPR method.

The following steps were carried out in preparing the tool.

- Literature review
- Preparation of blue print
- Consultation with guide, co-guide, subject experts and experts in CPR training.

4. Literature Review

Related literature review in the form of books, journals, periodicals, published and unpublished research studies and mass education media literature was reviewed and the tool was developed.

Preparation of the Blueprint

A blueprint of items pertaining to the three domains of learning that is

Knowledge, Attitude and Application was prepared. There are

- Nine items (30%) on Knowledge domain.
- Seven items (23.33%) on Attitude domain.
- 14 items (46.66%) on Application domain.

Description of the Tool

Part – I: Consisted of items related to demographic data of the subjects such as age, sex, Educational Stream, Religion, caste, gross family Income, Per capita income & status of any prior information on CPR.

Part-II Consisted of 30 questionnaires on

- General concept of CPR : 12 items (40.00%,)
- Steps and Technique of CPR: 13 items (43.33%),
- Post resuscitation care of CPR: 05 items (16.66%).

All the items in this area given score of one for each correct answer and zero score for wrong answer.

Knowledge score was arbitrarily graded as:

- Poor: 00-10
- Good: 11-20
- Excellent: 21-30

Validity of the Tool

Content validity of the tool was established by 5 experts comprising of nurse educator & doctors. They were requested to give their opinions and suggestions regarding the relevance of the tool for further modification of items to improve clarity and content of items.

Part II which consists of 30 items, had 100% agreements and checklist has 100% agreement with suggestion of re-organizing the question. After considering experts suggestions in CPR training, subject experts, in consultation with the guide the tool was modified. The final tool consisted of the demographic data items & for knowledge on CPR 30 items and observation checklist consisted of 25 items on skill about CPR technique.

Pre-testing of the Tool

Pre-testing is the process of measuring the effectiveness of an instrument. The purpose is to reveal the problems relating to answering, completing and returning the instrument and to point out weakness in the administration, organization and distribution of the instrument (Treece and Treece, 1988)[64].

Pre-testing of the structured questionnaire was done to clarity of items, feasibility and practicability of the tool. It was administered to fifty students of St. Wilfred PG College, who were similar in characteristics to those of the population under study. The students took 35-40 minutes to complete the questionnaire and the items were clear and understandable by them.

Reliability of the Tool

Reliability is the degree of consistency or dependability with which an instrument measures the attribute it is designed to measure (Polit and Hungler, 1999)[61].

The tool after validation was subjected to test for its reliability. The questionnaire was administered to fifty students. The reliability was established by using split half technique and Spearman's Brown prophecy formula. Co-efficient of correlation of knowledge test was found to be r = 0.88. Since the computed correlation of knowledge score was high the tool was found to be reliable. Inter-rater observation technique was adopted to estimate the reliability of the observation checklist. Procedure performed by fifty students was observed and recorded at the same time by two observers. Karl Pearson Co relation co-efficient was used to find out linear co- relationship between the two sets of scores. The reliability of the checklist was found r = 0.97 which indicate that the tool was reliable.

Development of structured Planned Training

The structured Planned training was developed based on the review of the related research /non research literature and the objectives stated in the blueprint. The following steps were adopted to develop the training schedule-

- Development of content blueprint.
- Development of structured planned training
- Establishment of content validity of structured planned training
- Pre-testing of structured planned training for teaching

Content of Blueprint

A blueprint of objectives and context pertaining to the three domains of learning that is knowledge, Attitude and Application was prepared for the construction of self administered structured questionnaire. Objectives were distributed under following learning areas. The components consisted of specific human anatomy and physiology of circulatory and respiratory systems, heart lung brain relationship, meaning, definition and classification, indications, sequences of CPR, demonstration, complications, termination and various causes of failure of CPR.

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Content Validity of structured planned training:

The initial draft of PTP was given to five experts, comprised of nurse educators, doctors along with the criteria checklist. The experts were requested to validate the PTP based on criteria checklist and to give suggestions on the adequacy and relevance of content. Suggestion given was duration of one hour was insufficient for the class and demonstration should enable improvement in acquiring skill than more performance of CPR technique and the suggestions were incorporated.

Preparation of Final Draft of structured planned training:

The final draft of structured planned training was prepared by incorporating the suggestions of the experts in CPR training, subject experts after consultation with guide and co-guide.

Description of Training programme:

The structured planned training was titled "Basic life Support by CPR technique". The training included introduction, general and specific objectives and references. The training was planned for two sessions which was prepared to enhance and reinforce the

knowledge and skills of degree students. It consisted of the following content areas-

- ❖Introduction
- ❖Specific human anatomy and physiology of circulatory and respiratory system
- ❖The heart-lung-brain relationship
- ❖Meaning and Definition of CPR
- ❖Indication of CPR
- ❖Steps of CPR
- ❖Demonstrations, Terminations
- ❖Complications of CPR Failure of CPR

5. Planning for Teaching

- **Selecting the Method of Teaching**

Lecture cum demonstration and discussion method was selected as an appropriate method of teaching the degree students. It was planned to teach in group. Since group teaching permits to exchange the views, broaden the knowledge through wider interaction, practice the technique to improve the skill and to be competent.

- **Determination of Physical Facilities**

It was planned to consult Principal of Degree Colleges and Coordinators of the Departments. Then it was decided to conduct Planned Teaching Programme in classroom with physical facilities.

- **Planning to Implement the structured planned training programme**

It was planned and decided the time and date to implement the PTP

- **Information to the Participants**

It was planned to inform the sample well in advance so as to conduct the training schedule according to their convenience.

- **Determining the Method of Evaluating structured planned training**

The evaluation of training was through post-test after ten days of implementation of teaching programme.

Pilot Study

A Pilot study was conducted between 09/01/13 to 23/01/13 to,

1) Find out the feasibility of conducting the study
2) Evaluate the effectiveness of structured planned training
3) Determine the method of data analysis.

One hundred & Fifty students were selected randomly who were not from actual study group. On first day pre-test was administered and Planned Training Programme was given on second day. Post-test was conducted on the tenth day using the same structured questionnaire to assess the knowledge and skill was evaluated with check list as post-test. The mean Post-test score of pilot study was 91.9% on knowledge aspect was higher than the Mean Pre-test score of 39.8% & also the skill score of 96.5% in the post skills improved from 17.8% pre skill score with t value of 17.76 being significant at $P<0.001$ level.

The findings of the data revealed that the study is feasible.

Process of Data Collection:

➢ **Ethical clearance:**

The study was approved by the Institutional Ethical committee of the Krishna of Medical Sciences Deemed University, Karad Maharashtra, before the commencement of the study.

Permission from the Concerned Authority

Formal permission was obtained from selected degree colleges and approval was obtained to conduct the study, after taking permission the schedule was also informed to the students according to sections & divisions.

➢ **Period of data Collection**

The data collection procedure was carried out for the students studied during July 2012 to June 2014 by dividing the students in to different sections and groups.

The investigator collected data on pre & post - test knowledge questionnaire and pre & post skills observed using observation check list, the observations were recorded with the help of the co-ordinators and Planned Training programme was implemented in different divisions.

Plan for Data Analysis

The data obtained was analyzed in terms of the objectives of the study using descriptive and inferential statistics. The research design selected for present study was pre-experimental research design single group pre-test and post-test design, adopted in the evaluative research approach for collection and analysis of data. The primary objective of teaching programme on CPR-Basic life support on randomly selected sample of 1500 degree students in terms of Mean gain in knowledge and skills test. The design did not include any control group.

The study design shows that on the first day**,** pre-test was given to collect the data by a self administered knowledge questionnaire. On second to fifteen day Pre –test skills observed, and Fifteen to thirty day Planned Teaching Programme on CPR –Basic life support –adult 1 which includes demonstration with an aid of Manikin was conducted. Later on 31th day onwards post-test was conducted to assess the knowledge and practice concerning skill with the same pre-test questionnaire as the post-test and improvement of skill was evaluated with checklist to assess the skill concerning CPR technique. The study design is depicted in figures. The entire study

design and data collection plan was completed by dividing the participants in to different division & section wise.

6. Results / Discussion

In all 1500 students participants were enrolled. Out of them 1184(78.9%) were males and 316(21.1%) were females.

Table 1: Distribution of student participants According to Age

Age Groups (in years)	Frequency	%
18 to 19	1100	73.33
20 to 21	250	16.66
22 to 23	150	10
>24	0	0
Total	1500	100.0

Table 2: Distribution of Subjects According to Knowledge Scores Before and After training Intervention

Knowledge score	Pre-test		Post -test	
	Frequency	%	Frequency	%
Poor(00-10)	883	58.8	00	00
Good (11-20)	609	40.6	312	20.8
Excellent(21-30)	08	0.5	1188	79.2
Total	1500	100	1500	100

The participants were grouped in three categories according to their knowledge scores as poor, good and excellent scores obtained in pre and post training assessment. (2) Initially there were 883(58.8%).participants in the poor category who all improved after training as seen in the post test results showing no persons in poor category. There was only eight participant in the excellent score category before intervention which increased to 1188(79.2%) in excellent category of knowledge after training.

Table 3: Item wise effectiveness of Training intervention with regard to percentage of knowledge score on 'steps and technique of CPR'

Sr. no.	Area covered by the questions	Before	%	After	%	% Difference
13	The basic skill groups of CPR are to assess circulation airway, breathing.	1251	83.4	1500	100	16.6
14	First thing that the rescuer needs to do for the collapsed victim is check for unresponsiveness	246	16.4	1485	99	82.6
15	The proper way to determine unresponsiveness is shake and shout at person	100	6.67	1482	98.8	92.13
16	Reason for assessing the victim for 10 seconds is not to confirm death of the person	388	25.87	1500	100	74.13
17	The best position to give CPR is to place the victim flat on the floor	950	63.34	1499	99.93	36.59
18	The most effective method of opening airway is Head tilt chin lift maneuver	450	30	1425	95	65
19	Determination of breathing in unconscious victim by look listen and feel of air exchange	550	36.67	1450	96.67	60
20	Duration of each ventilation should be ½ to 2 secs.	253	16.86	1500	100	83.14
21	The assessment to initiate chest compression after observing the absence of breathing, coughing or moving	408	27.2	1500	100	72.8
22	During chest compression, hands should be placed on middle of the lower half of the chest bone	549	36.6	1500	100	63.4
23	The depth of the chest compression on the sternum is 1- 1½ inch	650	43.33	1500	100	56.67
24	The rate of compression is 100 per min	105	7	1500	100	93
25	Compression ventilation ratio is 30:2	105	7	1500	100	93

Table.21: Findings revel that, the highest percentage of the effectiveness (92.13%)was observed in the item, 'the proper way to determine unresponsiveness is shake and shout at person' and the least percentage (16.66%) of effectiveness was observed in the item 'the basic skill groups of CPR are assess airway, breathing and circulation' in which pre-test score was also high.

Percentage of effectiveness (93%) was found in the item 'the rate of compression is 100 per min' and 'Compression ventilation ratio' An effectiveness of 83.14%for the item

'duration of each ventilation should be ½ to 2 secs.' 56.67 percent in 'the depth of the chest compression on the sternum is 1- 1½ inch'; 74.13% in 'reason for assessing the victim for 10 seconds is not to confirm death of the person' and 'during chest compression, hands should be placed on middle of the lower half of the chest bone'; 36.59% in 'the best position to give CPR is to place the victim flat on the floor' was observed.

Table 4: Item wise effectiveness of training intervention with regard to percentage of knowledge score on 'post resuscitation care'

Sr. no.	Area covered by the questions	Before	%	After	%	% Difference
26	Situation in which CPR should not be stopped is when ambulance arrives	257	17.13	1335	89	71.87
27	Common complication of chest compression is fracture of the ribs	1200	80	1500	100	20
28	The main cause of failure of CPR is when delay in assessment and intervention of the victim	750	50	1500	100	50
29	The recovery position after the CPR is place the victim on his or her side	127	8.47	1466	97.73	89.26
30	When the patient regains consciousness provide psychological support	450	30	1500	100	70
	TOTAL 30 KNOWLEDGE QUESTIONS					

Table 4: Findings reveal that the highest percentage of (89.26%) of the effectiveness was found in the item 'the recovery position after the CPR is place the victim on his or her side'. The least (20%) effectiveness was found in two items, i.e., 'common complication of chest compression is fracture of the ribs' and 'the main cause of failure of CPR is when delayed in assessment and intervention of the victim.' An effectiveness of 71.87% in 'situation in which CPR should not be stopped is when ambulance arrives', 70% in 'when the patient regains consciousness provide psychological support' was observed.

The present study was conducted to evaluate the effectiveness of BLS training on life saving skills among degree students. Pre experimental research design with single group pre-test post-test design approach was adopted in order to achieve the objective of the study. The samples were selected using simple random technique. The sample of 1500 degree students and the data was collected by using a structured questionnaire before and after administration of training schedule. Observation checklist was used to evaluate the pre & post-test skill. There has been highly significant improvement in grades in both the knowledge and skills after Educational Training

CPR has been existing since biblical time. Men have attempted to restore life to the death or nearly dead individual. In the eighteenth century, it was common in Europe to throw an unconscious person over the backs of trotting horses or rolling them over barrels, in an attempt to move air in and out of their chests. Later Schefer's prone position method of artificial respiration was developed. In 1960s Mr. Kouwenhoven and his associates developed the present technique of external chest compression in the supine position and coupled this with artificial respiration [1]

WHO regional office for Europe conveyed a meeting of personnel for the need of knowledge about Basic Life Support at Bergen, Norway in 1998 to all the youth of the nation to save lives as being one of the best first aid therapy prior to reach of secondary level help[7].

According to Health Information India (1998) the rate of death due to accidents and injuries in 1992 was 5.9 %(953/16,143) and it became Seven Percent (1,269/18,262) by 1996. Distribution of death rate in relation to age shows that the maximum number of deaths occurring due to accidents and injuries (22.7%) occur in the age group of 16-24 years[8].

National Academy of Sciences and National Council in 2002 emphasized to rediscover the value of teaching CPR in colleges. In 1998, American Health Association began a large scale evaluation of CPR in colleges in the United States. Experts at the International Guidelines 2000 Conference strongly recommended development of CPR programs in colleges to ensure widespread learning of CPR and other BLS skills, because 70 - 80% of cardiac arrests occur at home[11].

Description of the demographic characteristics of the degree students

In this study, it is observed that age of male and female participants ranged from minimum 18 to maximum 23 years respectively.. Majority 1100(73.33%) were from the age group of 18-19 yrs, and Sex wise distribution of 1500 participants Out of them 1184 (78.9%) were males and 316(21.1%) were females.

Analysis related on the basis of information received by the sample revealed that majority 96.67% of the respondents had not received any information earlier

3.33% of the respondents had received the information through mass media.

Half of the total participants were from arts 750(50%) & half of them from commerce stream 750(50%).

The participants were grouped in three categories according to their knowledge scores as poor, good and excellent scores obtained in pre and post training assessment. Initially there were 883(58.8%).participants in the poor category who all improved after educational intervention as seen in the post test results showing no persons in poor category. There was only eight participant in the excellent score category before intervention which increased to 1188(79.2%) in excellent category of knowledge after training.

The participants were grouped in three categories according to their skills scores in to poor, good and excellent scores obtained in pre-training- observation and post training-observation. Initially, there were 1259(83.9%) in the poor category, who all improved after educational intervention as seen in the post training observation results showing only 32(2.1%) persons in poor category. There was not a single student in the excellent category of score before intervention which increased to 665 (44.3%) in excellent category of skills.

But there was no significant difference in the mean improvement in the knowledge and practice score in different age groups.
In this study, the mean knowledge scores and mean practice scores improved in both sex. The minimum increase in knowledge score was 14.51seen in males and maximum increase was 17.05 seen in females. Similarly, the minimum increase in skills score 12.68 seen in males and maximum increase was 13.15 seen in females.

The mean knowledge scores and mean practice scores improved in all religion groups. The minimum increase in knowledge score was 9.44 seen in Muslim religion group and maximum increase was 12.28 and seen in Christian religion group. The distribution for all religion groups of after scores of in knowledge were also not different in different religion groups. Which indicated that improvement in the knowledge scores was not related to religion?

The mean knowledge scores and mean skills scores improved in all caste groups. The minimum increase in knowledge score was 10.4 seen in OBC caste group and maximum increase was 11.2 and seen in Open caste group. The distribution for all caste groups of after scores of in practices were also not different in different caste groups which indicated that improvement in the skills scores was not related to caste.

In the present study, The mean knowledge scores and mean skills scores improved in all gross family income groups. The minimum increase in knowledge score was 10.62 seen in >19843 group and maximum increase was 13.4 and seen in 7441-9921 group. Similarly The minimum increase in skills score was 11 seen in 7441-9921group and maximum increase was 16.41 seen 4961-7440 group. But there was no significant difference in the mean improvement in the knowledge and skills score in different gross family income groups. The mean knowledge scores and mean skills scores improved in all gross family income groups. The minimum increase in knowledge score was 10.72 seen in 1308- 2615 group and maximum increase was 11 and seen in 981-1307 group. Similarly The minimum increase in skills score was 13.78 seen in 1308- 2615 group and >2615 group and maximum increase was 14 seen 981-1307 group.

But there was no significant difference in the mean improvement in the knowledge and skills score in different gross family income groups.

In the present study, It was revealed that knowledge scores before training for participants received information (p=0.048) and were more than participants 'not received any information'. Also skills scores before training for participants who received information (p=0.002) were more than participants who 'not received any information' and skills scores after training for. This meant that information level has impact on knowledge and skills scores. The similar findings revealed by the study conducted by Ruth Rekha (1997) to evaluate the effectiveness of planned teaching programme among the staff nurses of Basic Life Support in terms of knowledge and skill. She observed that post-test knowledge score mean difference was 1.53 percent and standard deviation was 3.24 and 't' value was 19.49. The significance set at 0.05 level

The study is supported by Anthony Pillai (1992)studied Advanced Cardiac Life Support (ACLS) among intensive care nurses. The results showed that most nurses interviewed were only able to answer correctly half the questions asked. The result indicated that the nurses had lack of knowledge and need for structured training package in ACLS, followed by frequent reinforcement of ACLS knowledge and skills for nurses practicing in an intensive care unit[44].

Similarly in the present study, Berden H. J. et al (1992) studied valid reproducible system for determining BLS skills can help to evaluate effect of instruction courses and estimate the results of educational activities. The study used five criteria with standards and guidelines of American Heart Association such as inadequate technique may be reflected by a fail score, skill person should achieve pass score, the effect of training must be reflected by an improvement of score and system should be simple to apply and CPR attempts were performed on manikin. It was tested on 40 ambulance nurses and 148 lay persons twice. The system satisfied five criteria and offers a reliable and reproducible evaluation of Basic Life Support skills[66].

7. Conclusion

Total 1500 participants included in the study and grouped in three categories according to their knowledge scores as poor, good and excellent scores obtained in pre and post

training assessments among them there were 883(58.8%).participants in the poor category who all improved after training as in the post test results none of the person found in poor category. There was only eight participant in the excellent score category before intervention which increased to 1188(79.2%) in excellent category of knowledge after imparting training.

There was mean knowledge score of 9.3 with SD3.9 before the training on BLS which increased to mean score of 25.0 with SD 2.4 the skills score was 7.5 with SD2.78 before training which increased to 21.6 with SD 3.8 after training both these difference in knowledge and skills score before training and after training statistically highly significant ($t=34.4$; $p<0.001$and $t=39.1$; $p<0.001$ respectively).

The participants were grouped in three categories according to their skills scores in to poor, good and excellent scores obtained in pre-training- observation and post training-observation. Initially there were 1259(83.9%) in the poor category, who all improved after educational intervention as seen in the post training observation results showing only 32(2.1%) persons in poor category. There was not a single student in the excellent category of score before intervention which increased to 665 (44.3%) in excellent category of practices.

There was no significant difference according to age, sex, educational stream, religion, cast, Gross family income, Per capita income & any prior information received through mass media of the participants.

Irrespective of initial scores of knowledge and skills scores the after scores were significantly high and similar in all categories of age, sex, education stream, religion, cast, Gross income, per capita income of family & information received prior.

However, It was revealed that knowledge scores before training for participants received prior information through mass media ($p=0.048$) were more than participants 'not received any information'. Also skills scores before training for participants who received prior information through mass media ($p=0.002$) were more than participants who 'not received any information' and skills scores after training . This meant that information level has impact on knowledge and skills scores.

In item wise effectiveness of knowledge items, it revealed that highest percentage of effectiveness (90.07%) was observed in the item 'the common cause of airway obstruction in an unconscious victim is tongue'. In "General Concepts of CPR' and, Percentage of effectiveness (93%) was found in the item 'the rate of compression is 100 per min. in 'steps and technique of CPR' whereas highest percentage of (89.26%) of the effectiveness was found in the item 'the recovery position after the CPR is place the victim on his or her side' in 'Post resuscitation care".

Item wise increase in the skills of the students revealed that; all the participant's skills are improved after training intervention, mostly all the students performed correctly in all the areas of CPR technique after intervention, whereas before 25% students 'called for help while assessing the client', whereas 98.87% subjects 'kept the heel of the hand in contact with victim's chest correctly after training, while 0nly 1% participants before and after training 98.13% students 'continued to maintain the head tilt maneuver.'

8. Recommendations

On the basis of the findings of the present study, the following recommendations have been made:

- College students must be educated about basic life support and should be made aware of emergencies which may arise in the society any time.
- Coverage through mass media should be included.
- Training on BLS can be an important asset as it might be included in skill India programme for the emerging youth.
- All the citizens must understand basic life support and its uses & recommendations and their responsibility..
- Broad Media coverage can also generate awareness among the citizens about life savings skills prior to reach of any medical support.
- A study can be undertaken in different setting with different target populations such as Police, Security Guards of residential societies, school children, school teachers, college students of different disciplines, parents, drivers, fire force and traffic policemen & youth.
- A study can be conducted to determine the knowledge and practice on health care providers as ward boys, attendants, technicians, doctors & staff nurses.
- A self-instructional module can be developed on the learning needs of the Basic life support.
- Similar studies could be undertaken using other teaching strategy like video film, film shows or telephonic instruction
- A similar study could be taken in two rescuer and paediatric cardiopulmonary resuscitation.

After the research was completed these suggestions were communicated to the administrative personnel of Different departments.

9. Interpretation & Conclusion

The analysis of data revealed that, the post assessment of knowledge and observed skills score significant higher than pre-test and observation score at $p<0.05$ level of subjects.

There was mean knowledge score of 9.3 with SD3.9 before the training on BLS which increased to mean score of 25.0 with SD 2.4 the skills score was 7.5 with SD2.78 before training which increased to 21.6 with SD 3.8 after training both these difference in knowledge and skills score before training and after training statistically highly significant ($t=34.4$; $p<0.001$and $t=39.1$; $p<0.001$ respectively).

The investigator concluded that the training on BLS was good method of conveying information by demonstration. Therefore planned teaching and demonstration is logical solution for improving knowledge & skills about CPR in cases of emergency life saving skills in the particular group of the society.

10. Future Scope

From the findings of the study, the following implications are suggested.

- Present study would help to understand level of knowledge of students regarding BLS & CPR technique
- The findings would help the college students to develop an insight in importance of Basic Life support training.
- The findings suggest that there is an increasing need for an awareness programme on basic life support & CPR technique.
- Planed training programme can be utilized by undergraduate, graduate and post graduate students of any course.
- Community health workers can utilize this method for teaching the public regarding CPR.
- The study also emphasizes the need of education to improve the knowledge regarding the CPR for students.
- Planned teaching programme can be used for future reference.
- The training programme can also be used to impart continuing education programme for the nursing personnel.

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