A Study to Determine the Effectiveness of Basic Life Support Training 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 to evaluate the ''A study to determine the effectiveness of basic life support training on life saving skills among college students" in selected colleges at Jaipur for degree students. 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. Objectives of the Study: 1. To observe the pre & post training Intervention skills on basic life support for life saving among college students. 2. To determine the association between knowledge & skills with selected demographic variables. 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 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 objectives of the study an observation checklist to evaluate the skill concerning Basic Life support training of the degree students to evaluate the effectiveness of skills. 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. 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 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 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'. 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. 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'. Interpretation & Conclusion: 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.*

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

1. Introduction

Once life begins, instincts begin to work and also to preserve it. For life by itself strives to live and not to die. And that is the normal natural process called life. Meanwhile there are many challenges too. But instinct again seeks and finds ways and means of preserving that precious little life.

The birth and death are the two natural phenomena that all of us have to accept. When a child is born we are happy because a new person is added to our company, whereas when a person dies we are sad because he goes away from us and never returns. This death occurs at any time due to any cause. But some death can be prevented by our careful interference. For example, death due to cardiac arrest can be prevented by giving cardio pulmonary resuscitation (CPR) in time[1].

Resuscitation "is the art of restoring life or consciousness of one apparently dead. Resuscitation attempts date way back in time. Cardiopulmonary resuscitation (CPR) is one of the most evolving areas of saving actions that improve the survival rates following cardiac arrest. Today, whether you are a resident of Mumbai, Rajasthan, Assam, Kerala, or Punjab, it's simply a matter of luck, whether you will get good medical care during emergency "there is a general lack of awareness among public and policy makers about what emergency care is all about in most cases[2].

It is important that people in the society know the BLS skills to save lives and improve the quality of the

community's health. This becomes more important for paramedical staff who are facing life threatening situations. In this study, we showed that hands on skill make an obvious difference to improve skill of BLS. In earlier days CPR training was meant only for health care professionals. Later it was noticed that many of these events occurred outside the hospital setting, and that early CPR need to be performed by the bystanders who witnessed the scene. Hence, CPR is said to be a skill for all. Quality of life is also found to be better for victims who immediately receive bystander CPR even in absence of professional assistance[2].

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[3.]

Irreversible brain damage may occur when cessation of circulation lasts longer than a few minutes. Hence, to save the precious life, measures are to be taken immediately at the shortest time elapse possible. However, the immediate application of modern resuscitation is often capable of preventing biologic death. Hence the Cardiopulmonary Resuscitation is the most modern and appropriate life saving emergency technique known so far to reverse the Cardiopulmonary Arrest, which is practiced throughout the world to meet the oxygen and nutritional demands of the cells of the brain[3].

Cardiopulmonary Resuscitation is a systematic therapy aiming at sustaining the vital organ functions until the natural cardiac function can be restored. Emergency resuscitation is done for critically ill who are deprived of oxygen[3].

Resuscitation includes all measures that are applied to revive patients who have stopped breathing suddenly and unexpectedly due to either respiratory or cardiac failure. Cardiac arrest is one of the common causes of cardio-respiratory failure. Cardiac arrest refers to a sudden state of apnea and circulatory failure. Cardiac arrest is synonymous with the terms sudden death; it means that the victim's heartbeat, circulation of blood and respiration have suddenly and unexpectedly stopped. Prompt action is vitally important for the success of cardiopulmonary resuscitation. When a person stops breathing spontaneously, his heart also stops beating, clinical death has occurred. Within four to six minutes, the cells of the brain, which are sensitive to the paucity of oxygen, begin to deteriorate. If the oxygen supply is not restored, the patient suffers irreversible brain damage and biological death occurs (AHA, 2000)[4].

Teaching is an essential part of education. Its special function is to impart knowledge, develops understanding and skills. It generally includes inculcation of values like truth. Teaching technology involves the mechanism of an instructional process in a classroom situation, with a level of teaching theories. There are principal teaching operations and establishment of a relation between theories and teaching operations.

Various teaching and reinforcement programmes have been very successful in teaching skills and knowledge required by a rescuer in a resuscitation attempt. The rescuer should acquire expanded coverage of humanistic aspects of resuscitation, including emotional response of the rescuers, guilt over a failed attempt dealing with survivors and family members, life support and resuscitation decisions and other psychological ethical and legal issues.

There should be more evaluation projects that attempts in interactive settings, to deal with these humanistic aspects of actual resuscitation practice. Techniques with demonstrated effectiveness could be adopted nationwide. The large degree of dependency that has evolved among systems that train rescuer in Basic Life Support (BLS) and those that demand documentation of emergency competency needs further exploration[4].

A Rescuer/Resuscitator is just a common person who may have learnt a standard method of application of basic life support best suited to his skill. He is trained to reach victim, identify problems, and provide emergency care by using facilities or materials available at that time before regular medical help is imparted (Gupta L.C., 2000)[3].

2. Literature Survey

Massive community efforts are devoted to delivering cardiopulmonary resuscitation (CPR) training to non healthy professionals and lay people. However most people can successfully learn to perform CPR. Beginning as early as two weeks after initial training, CPR knowledge to deteriorate in a wide variety of subjects and the role of practice and review is examined. The failure of many factors to improve knowledge of CPR based on a review of the literature and pertinent theory are offered (Colemans and Moser D. K., 2004)[19].

A Research study conducted on 'success of cardiopulmonary resuscitation after heart attack in hospital and outside hospital at New South Wales, Australia. Descriptive cross sectional and cohort study used among 4924 people aged 19-29, on the basis of community based register of all suspected heart attacks and sudden cardiac deaths[6].

Cardiopulmonary resuscitation was attempted in 41% of cases of cardiac arrest after myocardial infarction outside hospital and 63% of cases in hospital. Survival rates at 28 days were 12% and 39% respectively. Study reveals survival rate after CPR is higher in hospital compared with outside hospital and suggest to provide education to general public, students and non health professionals improve success of CPR outside hospital (Richard F. Heller et al, 2004).[20]

Since the introduction around 1960 of external cardiopulmonary resuscitation (CPR basic life support without equipment, i.e. steps A (airway control) B- (mouth-to- mouth breathing) C- (Chest compressions), training courses by instructors have been provided, first to medical personnel and later to some but not all lay persons. At present fewer than 30% of out-of-hospital resuscitation attempts are initiated by lay bystanders. The numbers of lives saved have remained suboptimal, in part because of a weak or absent first link in the life support chain. This review concerns education research aimed at helping more lay persons to acquire life supporting first aid (LSFA) skill levels and to use this skills[21].

A comparative study compares the retention of basic life support (BLS) skills after 6 and 12 months by lay persons trained either in a conventional manner, or using a staged approach. A total of 495 volunteers entered the study, 262 being randomly allocated to conventional training, and 233 to staged training. More of those who received conventional training, (36 and 17, respectively). The objective of this study, however, was to compare the strategies of the different training methods. A total of 291 volunteers (167 conventional and 124 staged training) were available for unannounced home testing of full conventional CPR 6 months after initial training, and 260 volunteers (135 conventional and 125 staged training) were tested at 12 months. Results suggest that training lay persons in basic life support skills using a staged approach leads to overall better skill retention at six and twelve months, and has other advantages including a greater willingness to re-attend follow-up classes (Smith et al, 2004)[22].

A retrospective study conducted to evaluate the potential benefits of bystander initiated cardiopulmonary resuscitation. They examined the clinical courses of 19 consecutive coronary unit patients who had experienced pre hospital cardiopulmonary resuscitation. Seven patients received basic life support from by stander within five minutes. Resuscitation in the other 12 patients was delayed beyond five minutes preceding the arrival of rescue personnel. Six out of seven early resuscitated patients survived compared with six of 12 late resuscitated patients (p<0.01). The early- resuscitated patients were more alert on admission and had lower pulmonary pressure and higher cardiac output compared to the late resuscitated patient. On follow up three early-resuscitated patients had returned to full-time work compared with none in the late group. Training to laymen to initiate early basic life support can benefit the cardio pulmonary collapse victim (Copley, Mantle, Rogers, Russel and Ruckley, 2003)[23].

A survey for Debyshire Ambulance services to obtain an estimate of current CPR teaching in 41 secondary schools in Southern Derbyshire to encourage the introduction or increased teaching of CPR. A self-completion questionnaire was sent with information on CPR teaching 15 out of 25 responded schools (60%) taught CPR, out of this 15 schools, seven (28%) taught CPR regularly and eight (32%) occasionally. Time constraints and a lack of suitably trained teachers were the main reason for not teaching CPR. Cost of tuition, cost of supply teachers and

lack of time were the most common barriers to training of teachers. Following the survey teachers and school nurses were then invited for a free CPR training course designed for schools, run by a mixture of voluntary organizations (Mindell, 2002)[24].

The physicians toward the recommendation of cardiopulmonary resuscitation as a basic and most important First Aid Measure, in the families of patients of a high risk of acute myocardial infarction or cardiac arrest. Survey of 83 cardiologists and 285 other physicians in Seattle, Washington area, showed that all physicians said such training is very important for family members of people with CAD. Majority (93%) of cardiologists and other physician (62%) recommended CPR training for at least one half of the families of high-risk patients (Mandel and Cobb, 2001)[25].

A pilot project on CPR in High School of Canada, were besides CPR they also taught identification of cardiac arrest. The study showed that in this decade mandatory training would translate into increased bystander initiated CPR and improved chances of survival for victims of cardiac arrest (Lyttle, 2000)[26].

The Basic Life Supporting first aid training of the public review and recommendations. Variable proportions of lay trainees was evaluated, ranging from school children to elderly persons, were found capable of performing BLS skill on manikins. self practice on manikins was more effective than instructor courses. More viewing of demonstrations without practice has enabled more persons to perform skills effectively compared to untrained control groups. The quality of BLS performance in the field and its impact on outcome of patients remained to be evaluated (Eisenburger P and Safar P., 1999)[27].

A study on a recommendation for improving CPR skill among 268 non health professionals and lay people at New Jersey, found lack of knowledge to perform CPR in them. However, 78.3% of people are shown interest in learning CPR skills. Studies indicated that necessity to educate non health professional and lay people by means of planned teaching programmes (Mosser D. Colemans, 1999)[28].

A retrospective study analyzed 215 resuscitation in 125 community hospital between 1995 and 1997, to evaluate the effectiveness of cardiopulmonary resuscitation. As survival after cardiopulmonary resuscitation depends upon the quality of pre hospital support availability of resuscitation equipment and the competence of the resuscitator. Study concluded that, out of 215 resuscitation 14.4% were discharged alive. This outcome is comparable to those reported from developed nations. Therefore, there is a need to collect data on outcomes in the Indian milieu to evaluate the determinant, of outcome after cardiopulmonary resuscitation (Rajaram, Rajagopalan, Pai, 1999)[29].

American Red Cross and the American Heart Association have produced instructor courses of many more first aid skills. Self-training methods might help all people acquire LSFA skills, but implementation is still lacking. Variable

proportions of lay trainees evaluated, ranging from school children to elderly persons, were found capable of performing LSFA skill on manikins. The quality of LSFA performance in the field and its impact on outcome of patients remains to be evaluated. Manikin practice proved necessary for best skill acquisition of steps B and C. Simplicity and repetition proved important. Repetitive television spots and brief internet movies for motivating and demonstrating would reach all people. LSFA should be part of basic health education (Eisenburger P, Safar P, 1999)[30]

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.

For the purpose of sample size, an important outcome of the study is to improve the knowledge & skills by training on BLS.

(Ms. Kabina Ratha et.al reported for their interventional study on BLS that, overall Pre-test knowledge mean score+ SD was 9.12+1.97 & post test mean score +SD was 13.4+2.89.)[61]

Now in this study, To find out significant improvement of 6% of mean difference, the sample size comes out 1454 with 5% level of significance & 80% power.

$$ n = \frac{(1.97^2 + 2.89^2)\,(1.96 + .84)^2}{(0.2568)^2} = 1454 $$

Thus minimum 1454 subjects were required to be 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 before observation check list for before skills.
➤ Performance in Post-test 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

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

➢ Checklist for assessing the skills concerning CPR technique.

Development of the Tool

In this study, 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.

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.

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.

Part-III Consisting observation checklist:

25 items on skill about CPR technique

▪ Assessment : 03 items
▪ Circulation: 12 items
▪ Airway: 02 items
▪ Breathing: 08 items

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

Skill score was arbitrarily graded as:

Poor: 00-09
Good: 10-18
Excellent: 19-25

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 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

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.

Development of Criteria Checklist

A criteria checklist was prepared to develop planned training schedule based on the literature review and the opinion of experts. The criteria checklist consisted of 19 criterion statements under the broad headings of

i)   Formulation of objectives
ii)   Selection of content
iii) Organization of content
iv)   Teaching aids
v)   Feasibility and practicability

The draft criteria checklist and structured planned training was given to five experts for validation and suggestions were incorporated.

Preparation of Planned training programme Preparation of first draft of PTP: A first draft of structured planned training was developed keeping in mind the objectives, criterion checklist, literature reviewed and opinion of experts. The main factors that were kept in mind while preparing PTP were : literacy level of the sample, method of teaching to be adopted, simplicity of language, relevance of teaching aids and attention span of the sample.

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

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.

• Selection and Preparation of AV Aids

LCD, Power Point slides, Demonstration on manikin for CPR was considered appropriate to increase the impact of teaching.

• Determining Teaching and Learning Activities

Teaching and learning activities were determined well in advance and included the following ;

✓Creating interest by motivating and reinforcing
✓Live demonstration
✓Discussion
✓Participatory discussion

• 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.

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. (**Annexure- I**)

➢ 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 plan of data analysis is as follows:

- Organization of data in Master sheet /Computer
- Frequencies and percentages for the analysis of demographic data
- Mean, Standard Deviation of Pre-test and Post-test scores.
- Paired 't' test values to determine the significance of the difference between mean score of pre-test and post-test subjects
- Mean gain scores of subjects indicating the enhancement knowledge scores.
- 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.

Results / Discussion

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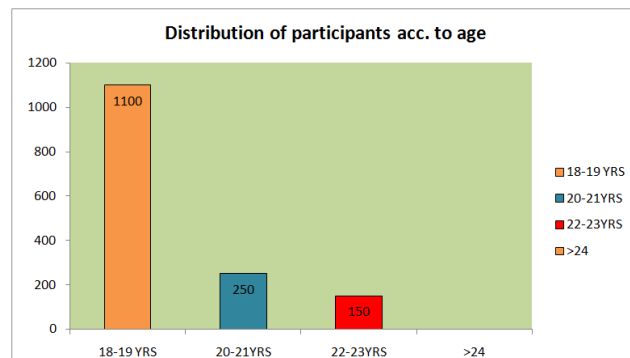

Figure 8: Distribution of participants According to Age.

Table 1: It was revealed & observed that age of male and female participants ranged from minimum 18 to maximum 23 years respectively. Majority 1100 (73.33%) were above the age group of 18-19 yrs
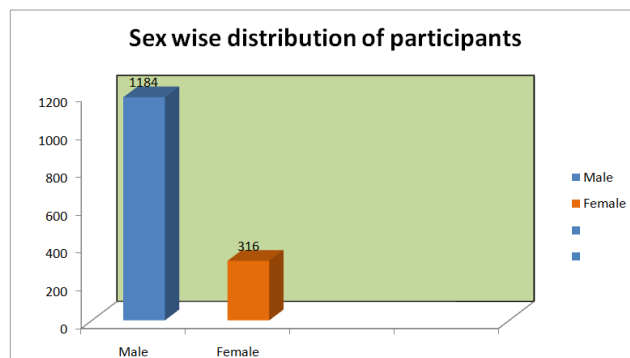

Figure 9: Distribution of participants According to Sex.

Table 2: Shows sex wise distribution of 1500 participants Out of them 1184 (78.9%) were males and 316 (21.1%) were females.
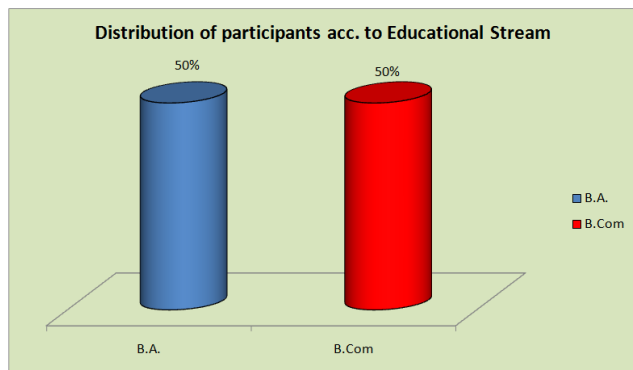
Figure 10: Distribution of student's participants According to Educational stream.

Table 3: Half of the total participants were from arts 750 (50%) & half of them from commerce stream 750 (50%).
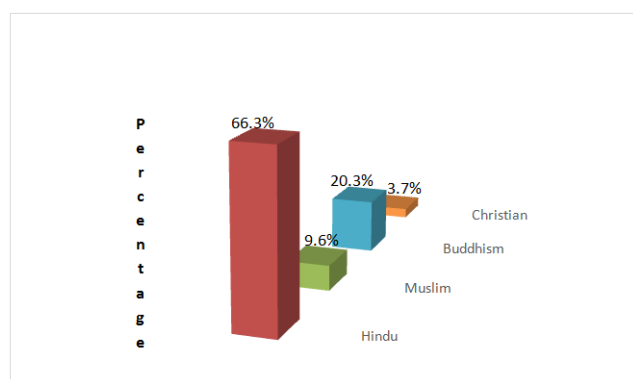

Figure 11: Distribution of participants According to Religion

Table 4: It shows majority 995 (66.3%) of the participants were Hindus and 144 (9.63%) were Muslims. Only 56 (03.74%) participants were Christian. Whereas 305 (20.3%) were Buddhist.
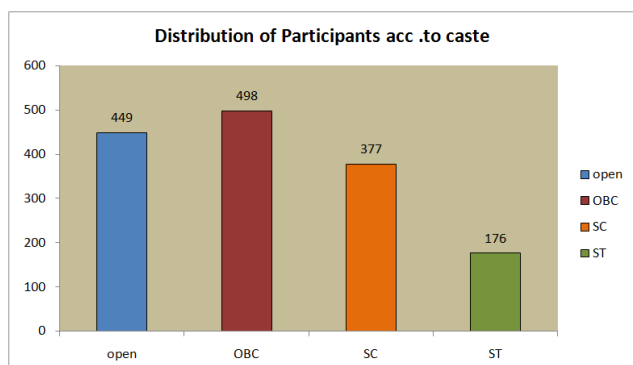

Figure 12: Distribution of student participants According to caste.

Table 5: Majority i.e.498 (33.2 %) of the participants were from OBC caste whereas 449 (29.9%) were from OPEN caste. It was observed that participants from SC and NT category were 377 (25.1%) and 176 (11.7%) respectively.
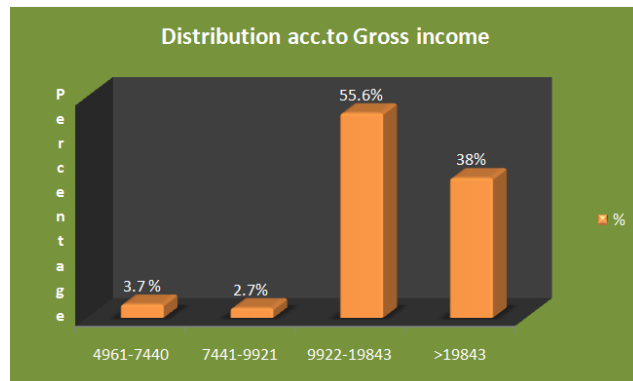

Figure 13: Distribution of participants According to Gross Family Income.

Table 6: Majority 834 (55.6%) of the participants **Gross Family Income** was **₹.** 9922 to 19843/- per month whereas 570 (38%) participants **Grass Family Income** was more than **₹**.19843/- per month and Only 41 (2.7%) of participants were in **₹**. 7441 to 9921/- **Gross Family Income per month.**
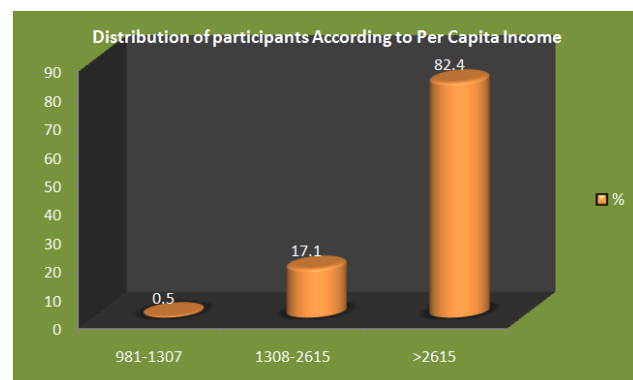

Figure 14: Distribution of student participants According to Per Capita Income.

Table 7: Out of all participants 1236 (82.4%) were having per capita income >2615 whereas 256 (17.1%) had per capita income in1308-2615and only 8 (0.5%) had per capita income in 981-1307.

Table 8: Percentage distribution of students according to the prior information on CPR

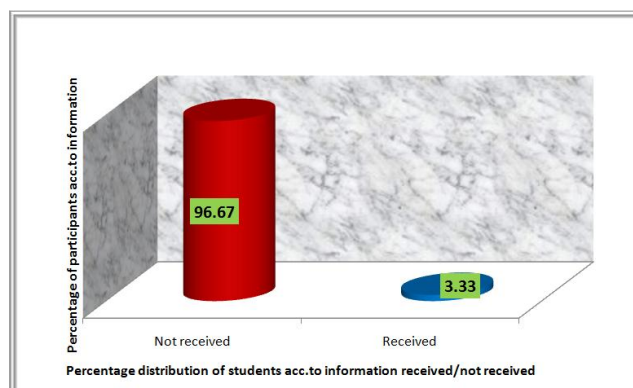| Distribution	No. of Students	Percentage
Information Not Received	1450	96.67
Information Received	50	3.33

Figure 15: Percentage distribution of students according to the information received previously

Table 8: Analysis related on the basis of information received by the sample reveals that majority 1450 (96.67%) of the respondents had not received any information earlier, only 50 (3.33%) of the respondents had received the information through mass media.
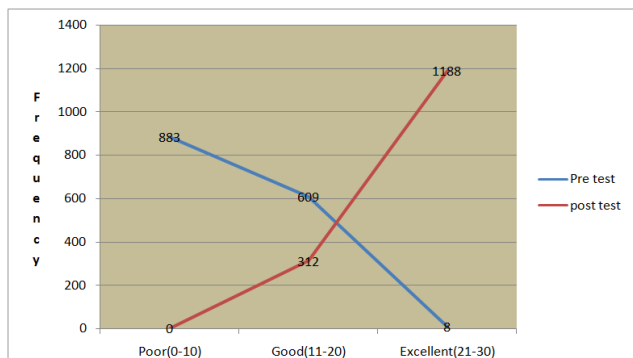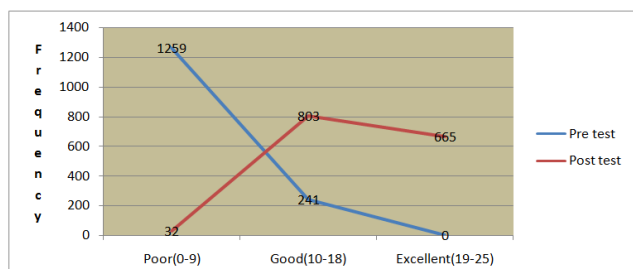

Figure 16: Frequency Distribution of Subjects According to Knowledge Categories before and after training

Table 09: 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. (Table 10) 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 10: Distribution of Subjects According to skills Scores Before and after training

Skills Scores	Pre-Training		Post-Training	
	Frequency	%	Frequency	%
Poor (00-09)	1259	83.9	32	2.1
Good (10-18)	241	16.1	803	53.5
Excellent (19-25)	00	00	665	44.3
Total	1500	100	1500	100

Table 10: 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.

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 female.

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 14.51 seen 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].

4. 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<0.001and 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- 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.'

5. 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 at 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.

6. 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<0.001and 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.

7. 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.

References

[1] Sagan C, Cosmos, New York: Random House, 1990.

[2] Bhattacharji Rabin, 2000, "Save a life foundation of India, "Health and Nutrition", Volume 12, 60-61.

[3] Gupta L. C. and Gupta A. Manual of First aid, New Delhi: Jaypee Brothers, 2000.

[4] Instructor manual for BLS, AHA, 2000.

[5] Gerald M. Dwarkin, 1999, "Necessity of teaching CPR in colleges", Dallas, AmJ Public Health, August, 72 (8): 849 – 852.

[6] National Centre of Health Statistics, WHO 2002, http://healthindiatimes.com articleshow/329953.cms

[7] National Centre of Health Statistics, WHO, 1998, http://healthindiatimes.com articleshow/008851.cms

[8] Health Information of India, 1998, http://www.tribuneindia.com/1998/20031012/ncr.htm.

[9] Instructor manual for basic life support, American Heart Association, 2001.

[10] Park K. "Text Book of preventive and social Medicine", Banarsidas BhanotPublishers, 18th Edition, Jabalpur, 2002.

[11] National Academy of Sciences and National Council, 2002.

[12] Stracciolini A., and Metzl, J. D., "Physical Medicine and Rehabilitation Clinics of North America", Philaddphia: W. B. Saunders Company, 2000.

[13] W.H.O., 1999, http://www.icn.who/matters_cpr_print.htm, Technical Report Series, 1999, http://info.org/cpr/index.htm

[14] Reena George, 2003, "Evaluate the effectiveness of a planned teaching programme regarding prevention of nutritional anaemia in adolescent girls of selected rural pre-university college at Mangalore, Unpublished M. Sc. Nursing thesis, RGUHS.

[15] Paula J. Christensen, Janet W. Kenney, "Nursing Process: Application of Conceptual Models", 4th Ed., St. Louis, Mosby 1995.

[16] Patricia A. Potter, Anne Griffin Perry, "Fundamentals of Nursing" 6thEd, Noida:Mosby, 2005.

[17] Talbot L.A., "Principles and Practice of Nursing Research", Chicago: C. V. Mosby Company, 1995.

[18] Abdellah F. G., Levine F., "Batter patient care through nursing research", NewYork: McMillan, 1979.

[19] Coleman S., Mosser D. K., 2002, "Recommendations for improving cardiopulmonary resuscitation skill", Heart-Lung Jul-Aug; 21 (4):372-380.

[20] Richard F. Heller, Vanderschmidt H. Burnap J. K., Thwaites J. K., "Evaluation of cardiopulmonary resuscitation course for secondary school retention study" Medcare 2004 Feb; 14 (2): 181-184.

[21] Webb M., Scot R., Beale P., "First aid manual", London: Ooring Kidersley, 2004. Tukaram Zagade, Asha Pratinidhi. Effectiveness of Educational Intervention on Knowledge and Practice among Bio-Medical Waste Handlers. International Journal of Science and Research (IJSR). 2014 May; 3 (5):285-295.

[22] Tukaram Zagade1& Amol Patil2 " Effectiveness of Self Instructional Module on Knowledge Regarding Prevention of Micro vascular and Macrovasclar Complications among Patients with Diabetes Mellitus" International Journal of science and Research Volume 3 Issue 5, May 2014: 902 to 908.

[23] Nilesh Pendase 1 Tukaram Zagade2 "Knowledge and Attitude Regarding Health Hazards of Mobile Phone Users among the Junior College Students" International Journal of science and Research Volume 3 Issue 5, May 2014 (IJSR):554 to 561.

[24] Amosh Talsandekar 1 Tukaram Zagade2 "Effectiveness of Learning Package on Knowledge about CardioRespiratory Assessment Among under Graduate student Nurses" International Journal of science and Research Volume 3 Issue 5, May 2014: 548 to 553.

[25] Asha Pratinidhi1 Tukaram Zagade1& Satish V Kakade3 "Effectiveness of Educational Intervention on Practice among Biomedical Waste Handlers" International Journal of science and Research Volume 3 Issue 8, August 2014: 1885 to1891

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