



To assess the effectiveness of structured teaching programme on knowledge and knowledge of practice regarding advanced cardiac life support among staff nurses.

Nursing

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ABSTRACT

BACKGROUND OF THE STUDY: In sudden death situations prompt and high quality ACLS is vital for patient survival. This can only be achieved by ensuring that nurses, and by extension, other health care professionals acquire the requisite ACLS knowledge and skills through training. **OBJECTIVES: 1)** To assess the existing knowledge and knowledge of practice among staff nurses regarding advanced cardiac life support before and after STP. **2)** To evaluate the effectiveness of STP regarding advanced cardiac life support among staff nurses. **3)** To find an association between the selected demographic variables of staff nurses and post test knowledge and knowledge of practice. **MATERIAL METHODS:** The study was conducted on 59 staff nurses at Krishna Hospital, Karad. Descriptive evaluatory approach was considered. Quasi experimental. One group pre-test post-test Study design was used; purposive random sampling technique was used. The instrument used for data collection was a Questionnaire on knowledge and knowledge of practice. **RESULTS:** Study concludes that majority of nursing staff having 30 (50.84%) good knowledge and majority of having 29(49.15%) average knowledge of practice regarding ACLS. There was no significant association found between knowledge among staff nurses with socio-demographic variable and there was no significant association found between knowledge of practice among staff nurses with age, gender and experience except education. **CONCLUSION:** Study concludes that Krishna hospital nursing staff having good knowledge and average knowledge of practice regarding ACLS after STP. thus, the STP was effective.

KEYWORDS:

Effectiveness, structured teaching programme, Knowledge, knowledge of practice, advanced cardiac life support, Staff nurses, hospital.

INTRODUCTION

Life is a most precious one for each individual, saving life of a person is noble thing in the entire world, now a day most of the death occurs due to the improper management of client, especially in the emergency situation. As a nurse we need a specialized knowledge in the emergency management.

Advanced cardiac life support refers to a set of clinical intervention for urgent treatment of cardiac arrest and other life threatening medical emergencies, as well as the knowledge and skills to deploy that intervention. Extensive medical knowledge and rigorous hands on training and practices are required to master advanced cardiac life support. Only qualified health care providers (eg:-physicians, physician's assistants, nurse, respiratory therapists and other special trained health care providers) can provide advanced cardiac life support. As it requires the ability to manage the patients air way, initiate IV access, read and interpret ECG and understand emergency pharmacology¹.

Good quality Basic Life Support (BLS) results in better survival. Basic Life Support is an essential skill that all professional nurses need to have. All nursing personals are taught Cardio-Pulmonary Resuscitation (CPR) during their professional training and also during the orientation programme prior to induction as a staff nurse².

There are many emergencies in the life of human being like stroke, poisoning, accidents, suicide, injury, medication error, shock and cardiac arrest. Among these cardiac arrest deaths remain major cause of mortality. Cardiac arrest can result from a primary airway obstruction, respiratory inadequacy and cardiac abnormalities or can be secondary to a life – threatening illness that comprises the airway, breathing or circulation. The three basic mechanisms of cardiac arrest are ventricular fibrillation, asystole and pulse less electrical activity. Ventricular fibrillation is the most common cause of cardiac arrest.³

Cardiac arrest is a leading cause of death in the United States, claiming an estimated 325,000 lives each year. Cardiac arrest kills 1,000 people a day or one person every two minutes. It is estimated that 95 percent of victims of cardiac arrest die before they reach a hospital. According to the Centers for Disease control and Prevention (CDC), deaths from cardiac arrest increased 10 percent (from 2,719 in 1989 to 3,000 in 1996) among people between the ages of 15 to 34 years. In young women, the death rate from sudden cardiac arrest increased 30 percent.⁴

Cardiopulmonary resuscitation is one of the major achievements in modern medicine. Among all organs brain withstands hypoxia the least. So within 15-30 seconds of cardiac arrest the person becomes unconscious and within 4 minutes brain gets irreversibly damaged. The priority in resuscitation is to get some oxygen to the brain. This stresses the importance that any resuscitation has to be done in 4 minutes to have a cognitive existence. After 4 minutes brain is already damaged and victim will have vegetative existence without higher function and will be a burden on the family with economic strain.⁵

Advanced Cardiovascular Life Support (ACLS) training is a specific set of protocols and practices that are taught to medical professionals so that they can handle a wide range of emergency situations. ACLS is distinct from Basic Life Support (BLS) training, because it covers a much broader range of possible problems. It also focuses more on the stabilization of a patient before and after an emergency. Due to the very advanced nature of many treatments as well as the controlled availability of many emergency devices and medications, ACLS training is restricted to medical personnel who have demonstrated BLS skills.⁶

Cardio pulmonary resuscitation and defibrillation are the central treatment of modalities of cardiac arrest in the current practice. Modern CPR has been divided into basic life support (BLS) and advanced cardiac life support (ACLS). BLS includes airway control, rescue breathing and external chest compression.⁷

The ability to respond quickly and effectively to a cardiac arrest situation rests on nurses being competent in the emergency life-saving procedure of cardiopulmonary resuscitation. Poor knowledge and skill retention following cardiopulmonary resuscitation training for nursing and medical staff has been documented over the past 20 years. Cardiopulmonary resuscitation training is mandatory for nursing staff and is important as nurses often discover the victims of in-hospital cardiac arrest.⁸

Need for study:

Cardiovascular disease is the world's leading killer, accounting for 16.7 million or 29.2 per cent of total global deaths in 2003. The World Health Organization (WHO) estimate that 60 per cent of the world's cardiac patients will be Indian by 2010. In India in the past five decades, rates of coronary disease among urban populations have risen from 4 per cent to 11 per cent. Nearly 50 per cent of CVD-related deaths in India occur below the age of 70, compared with just 22 per cent in the West. This trend is particularly alarming because of its potential impact on one of Asia's fastest-growing economies.⁹

In an article on the scenario of cardiac problems in India and the factors that have contributed to increasing the cardiac problems, the author related that "The prevalence rate of coronary heart disease in the urban population is more than three times than in the rural population. The incidence rate of stroke is 200 per 100,000 people. Every year approximately 25,000 coronary bypass operations and 12,000 angioplasties are carried out. In the past five decades, the rate of coronary disease prevalence among the urban population has risen from 4 per cent to 11 per cent. About 12.5 per cent of adult urban males suffer from coronary artery disease. Each year between 48,000 and 1,28,000 children are born with congenital heart diseases"¹⁰

Cardiac arrest remains a major cause of death in all parts of the world. In case if cardiac arrest can be detected and treated immediately, serious organ damage, brain damage, or death may be prevented. Cardiac arrest can occur both in adults and children, it may also happen suddenly in a person who was thought to be healthy.

Cardiac arrest can result from a primary airway obstruction, respiratory inadequacy and cardiac abnormalities or can be secondary to a life-threatening illness that comprises the airway, breathing or circulation. The three basic mechanisms of cardiac arrest are ventricular fibrillation, asystole and pulseless electrical activity.¹¹

Ventricular fibrillation is the initial rhythm most often identified by rescuers in cardiac arrest. The outcome of cardiac arrest is determined by how promptly treatment is initiated (advanced cardiac life support). To improve outcome from sudden cardiac arrest, the following must occur as rapidly as possible: (1) early recognition of warning signs; (2) early activation of emergency medical services; (3) early basic cardiopulmonary resuscitation; (4) early defibrillation & (5) early cardiac life support. These events have been described as "link in a chain of survival", because they are all connected & indispensable to the overall success of emergency cardiac care. For each cardiac nurse, participation in an advanced cardiac life support provider course by American heart association is strongly recommended.¹²

There was evidence that past advanced cardiac life support training programs have proven inconsistent and inadequate with numerous studies reporting trainees have poor retention and there for in effective advanced cardiac life support skill as a result. Increasing number of critically ill patients in hospital means that it has never been more important ensures the competence of health care professionals. A qualified person can open air ways, resuscitate, massage a heart and call for help¹³.

A person with advanced cardiac life support training can sustain an ailing person's heart and brain for a short time. They have a wide variety of responsibility during advanced cardiac life support, and

these require skills knowledge and a experience. The nursing staff holds a great responsibilities in saving life of the patient especially in the emergency conditioning for that each a nurse requires a specialized knowledge and skill in handling those conditions. Here advanced cardiac life support is the one of the common management used for the conditions¹⁴.

Advanced cardiac life support is only likely to be effective if commenced within 6 minutes after the blood flow stops. Because permanent brain cell damage occurs when fresh blood infuses the cells after that time, so initiating immediate Cardio-Pulmonary Resuscitation is very important in saving life of the patients. Despite the regular refresher training the quality of advanced cardiac life support is often all other reviews indicate that the nurse needs a specialized knowledge and skill in advanced cardiac life support.

PROBLEM STATEMENT:

A study to assess the effectiveness of structured teaching programme on knowledge and knowledge of practice regarding advanced cardiac life support among staff nurses working at Krishna hospital, karad.

OBJECTIVES:

- 1) To assess the existing knowledge and knowledge of practice among staff nurses regarding advanced cardiac life support before and after STP.
- 2) To evaluate the effectiveness of STP regarding advanced cardiac life support among staff nurses.
- 3) To find an association between the selected demographic variables of staff nurses and post test knowledge and knowledge of practice.

REVIEW OF LITERATURE:

Review of literature provides basis for future investigations, justifies the need for replication, throws light up on feasibility of the study, and indicates constraints of data collection and help to relate findings of one another.

Study conducted by Mayanlambam P, on Knowledge and practice regarding basic life support among nursing students. study concludes findings indicate that PTP given on knowledge and practice regarding BLS was effective¹⁵.

A study was conducted regarding the effectiveness of planned teaching programme (PTP) on knowledge and practice of Basic Life Support among high school students in Bangalore. The research design used for the study was quasi-experimental design. The sample consisted of 40 rural high school students. The study was conducted in rural high school of Mangalore and the subjects were selected through simple random sampling technique. The planned teaching programme facilitated them to update their knowledge and practice related to Basic Life Support. Hence, the planned teaching programme is an effective teaching strategy to improve knowledge and practice of sample on BLS¹⁶.

Study conducted by Rashmi Goswami on Effectiveness of Training Program on Knowledge and Practices Regarding Basic Life Support (BLS) Among Nursing Students findings of the study were that the mean of post test knowledge score 14.12±1.15 was higher than the mean of pre test knowledge score 7.19±2.00. The study further revealed that mean of post test practice scores of BLS was 23±1.18 was higher than the mean of pre test practice scores 10.31±3.84. Thus, the training program was effective in enhancing the knowledge and practices of Nursing Students regarding BLS¹⁷.

A study conducted on Assessment of the general knowledge of emergency physicians from hospitals of the city of Salvador (Brazil) on the care of cardiac arrest patients. The objective of the study was to identify the proportion of emergency physicians certified in immersion courses of Advanced Cardiac Life Support (ACLS),

professional profile, participation or not in ACLS, FCCS and ATLS immersion courses, and cognitive assessment with 22 objective questions on cardiopulmonary resuscitation. In the sample studied, theoretical knowledge of CPR was higher among physicians who had attended the ACLS course, as opposed to those who had attended the ATLS course. Cardiologists who had attended the ACLS demonstrated a higher theoretical knowledge of the care of CA patients when compared with physicians from other specialties taken as whole-internal medicine, surgery, and orthopedics. Physicians who had attended the ACLS and FCCS courses demonstrated a higher theoretical knowledge of the care of CA patients when compared with physicians who had attended only one of those courses; continued education is therefore essential¹⁸.

This study investigates the Mastery learning of advanced cardiac life support skills by internal medicine residents using simulation technology and deliberate practice. The aim of the study was to use a medical simulator to assess postgraduate year 2 residents' baseline proficiency in ACLS scenarios and evaluate the impact of an educational intervention grounded in deliberate practice on skill development to mastery standards. After baseline evaluation, residents received 4, 2-hour ACLS education sessions using a medical simulator. Residents were then retested. Performance improved significantly after simulator training. All residents met or exceeded the mastery competency standard¹⁹.

A study conducted on Knowledge and skill after brief ACLS training. An objective was to determine the knowledge level and skill base in nurse anaesthetists before and after brief ACLS training, and again three months later. Thirty nurse anaesthetists were tested for knowledge and skill before ACLS training comprising 1-hr lecture and handout, and 1-hr simulation training. Skill practice comprised airway management, chest compression and practice with equipment. After the training, the nurse anaesthetists were immediately tested and again three months later. Conclusion of the study was after the brief ACLS training knowledge and skills were significantly improved, but knowledge was not retained at the post-training test levels until the 3-month check, albeit skills had persisted. More frequent ACLS education is necessary²⁰.

A study conducted on the retention of advanced cardiac life support knowledge among registered nurses. In an investigation into the retention of advanced cardiac life support (ACLS) knowledge over time, the authors found that ACLS scores significantly decreased for a subgroup of a sample of 40 RNs employed in critical care areas in the first year after certification. Several variables that influenced scores were identified. Recommendations for in service educators include reconstructing the ways in which ACLS courses are taught, conducting mock mega code scenarios every 6 months, constructing mega code scenarios that reflect the reality of practice, and routinely conducting refresher courses based on problems identified in a particular group²¹.

A study conducted with an objective to determine whether an advanced cardiac life support (ACLS) course in a rural hospital will improve resuscitation success from cardiac arrest among twenty-nine patients in the pre-ACLS period and thirty five in the post-ACLS period over a period of 13 months. The study revealed that seven of 35 patients (20%) were resuscitated successfully in the post-ACLS period and two of 29 patients (7%) resuscitated in the pre-ACLS period and concluded that the institution of an ACLS-provider course in a rural community hospital had an improvement in initial resuscitation for patients with ventricular fibrillation/tachycardia and out-of-hospital arrest²².

MATERIAL METHOD:

The study was conducted on 59 staff nurses at Krishna Hospital, Karad. Descriptive evaluatory approach was considered. One group pre-test post-test Study design was used; purposive random sampling technique was used. The instrument used for data collection was a Questionnaire on knowledge and knowledge of practice.

INCLUSION CRITERIA FOR SAMPLING

- 1) Both male and female staff nurses working at KH, Karad.
- 2) Staff nurses who will present on the day of data collection.
- 3) Staff nurses who are willing to participate.

EXCLUSION CRITERIA

- Staff nurses who are not available at the time of study.
- Those who are not willing to participate.

ASSUMPTION:-

- There will be variation in the level of knowledge and knowledge of practice on advanced cardiac life support among staff nurses.
- There will be variation between knowledge and knowledge of practice and their selected demographic variable among staff nurses.
- Structured teaching programme may improve the knowledge of staff nurses on advanced cardiac life support.

HYPOTHESIS:-

- H1- There will be significant difference in mean pre test post test knowledge and knowledge of practice score.
- H2- There will be significant association between the selected demographic variables of staff nurses and post test knowledge and knowledge of practice.

OPERATIONAL DEFINITIONS:-

• Structured teaching programme:-

It refers a planned teaching schedule on different aspects of knowledge related to advanced cardiac life support.

• Knowledge:-

It refers to written response of the participants regarding advanced cardiac life support which is measured by questionnaire method.

• Effectiveness:-

Refers to the extent to which the structured teaching programmes on advanced cardiac life support has achieved the desired effect in improving the knowledge of nurses as assessed by structured questionnaire.

• Advanced cardiac life support

Advanced cardiac life support refers to a set of clinical interventions for the treatment of cardiac arrest and other life threatening medical emergencies, and also refers to the knowledge and skills necessary to deploy those interventions.

RESULTS:

Analysis and interpretation of the data was based on the projected objectives of the study viz.

OBJECTIVE

- 1) To assess the existing knowledge and knowledge of practice among staff nurses regarding advanced cardiac life support before and after STP.
- 2) To evaluate the effectiveness of STP regarding advanced cardiac life support among staff nurses.
- 3) To find an association between the selected demographic variables of staff nurses with post test knowledge and knowledge of practice.

Table no. 1 Distribution of staff nurses according to frequency and percentage of demographic variable. N=59

Sl. NO	Variables	Frequency (%)
1	Age	
	21 - 23 yrs	31 (52.54)
	24 - 26 yrs	25 (42.37)
	> 27yrs	03 (5.08)

2	Gender	
	Male	11 (18.64)
	Female	48 (81.35)
3	Education	
	RGNM(Registered General nurse & Midwife)	26 (44.06)
	B.BSc	33 (55.93)
4	Experience	
	1 - 5 yrs	54 (91.52)
	> 5yrs	05 (8.47)

Table No1. Reveals that majority of staff nurses 31(52.54%) belongs to age group of 21-23 years. Maximum staffs 48(81.35%) were female, majority 33(55.93%) staffs education were B.BSc. Maximum staffs 54 (91.52%) job experience was 1-5 years.

Table.2 Categorization according to pre-test knowledge and knowledge of practice score among nursing staff.

N=59

Categorization	Knowledge %	Knowledge of Practice %
Good	08 (13.55)	05 (8.47)
Average	31 (52.54)	04 (6.77)
Poor	20 (33.89)	50 (84.74)

Table No.2 indicates that in pre-test nursing staff having majority of 31 (52.54%) average knowledge and majority of 50 (84.74%) having poor knowledge of practice regarding ACLS.

Table.3 Categorization according to post-test knowledge and knowledge of practice score among nursing staff.

N=59

Categorization	Knowledge %	Knowledge of Practice %
Good	30 (50.84)	26 (44.06)
Average	29 (49.15)	29 (49.15)
Poor	0	04 (6.77)

Table No.3 indicates that in post-test nursing staff having majority of 30 (50.84%) good knowledge and majority of 29(49.15%) having average knowledge of practice regarding ACLS.

Table No.4 Pre-test and post knowledge and knowledge of practice score. N=59

	Mean	SD	t value	df	p.value
Pre test	10.79	4.084	10.944	57	< 0.0001
Post test	18.33	3.656			

Table No 4. Reveals that there was extremely significant difference between pre-test and post-test knowledge and knowledge of practice among nursing staff regarding ACLS.

Table No.5 knowledge score of pre-test and post-test among nursing staff. N=59

	Mean	SD	t value	df	p.value
Pre test	4.49	1.79	8.175	58	< 0.0001
Post test	6.77	1.53			

Table No 5. Reveals that there was extremely significant difference between pre-test and post-test knowledge among nursing staff regarding ACLS.

Table No.6 knowledge of practice score of pre-test and post-test among nursing staff. N=59

	Mean	SD	T value	df	p.value
Pre test	6.30	2.97	13.249	58	< 0.0001
Post test	11.57	2.62			

Table No 6. Reveals that there was extremely significant difference between pre-test and post-test knowledge of practice among nursing staff regarding ACLS.

Table No 7. Association between the selected demographic variables of staff nurses with post test knowledge. N=59

SI NO	Variables	Particulars	Good	Average	Poor	Chi Square value	p. value	df
1	Age	21-23 years	18	12	01	2.626	0.2691	2
		>24 years	12	16	0			
2	Gender	Male	8	3	0	2.590	0.1076	1
		Female	22	26	0			
3	Education	RGNM	12	16	0	0.8450	0.3580	1
		B.BSc	17	14	0			
4	Experience	1-5 years	28	26	0	0.2572	0.6121	1
		>5years	02	03	0			

Table No.7. Chi square test was used to find an association of knowledge among staff nurses with socio-demographic variables; it showed that there was no significant association found between knowledge among staff nurses with socio-demographic variable.

Table No.8. Association between the selected demographic variables of staff nurses with post test knowledge of practice. N=59

SI NO	Variables	Particulars	Good	Average	Poor	Chi Square Value	p. value	df
1	Age	21-23 years	15	12	04	5.339	0.0693	2
		> 24 years	11	17	0			
2	Gender	Male	08	02	01	5.214	0.0738	2
		Female	19	27	02			
3	Education	RGNM	04	19	03	15.644	0.0004	2
		B.BSc	22	10	01			
4	Experience	1-5 years	25	25	04	2.146	0.3420	2
		>5years	01	04	0			

Table No.8 Chi square test was used to find an association of knowledge of practice among staff nurses with socio-demographic variables; it showed that there was no significant association found between knowledge of practice among staff nurses with age, gender and experience except education.

DISCUSSION:

The present study found nursing staff having majority of 30 (50.84) % good knowledge and majority of 29(49.15) % having average knowledge of practice regarding ACLS after STP. Thus, the STP was effective. Similar study conducted by Mayanlambam P, on Knowledge and practice regarding basic life support among nursing students. Study concludes findings indicate that PTP given on knowledge and practice regarding BLS was effective. One more similar study conducted by Rashmi Goswami on Effectiveness of Training Program on Knowledge and Practices Regarding Basic Life Support (BLS) Among Nursing Students findings of the study were that the mean of post test knowledge score 14.12±1.15 was higher than the mean of pre test knowledge score 7.19±2.00. The study further revealed that mean of post test practice scores of BLS was 23±1.18 was higher than the mean of pre test practice scores 10.31±3.84. Thus, the training program was effective in enhancing the knowledge and practices of Nursing Students regarding BLS.

CONCLUSION:

Study concludes that Krishna hospital nursing staff having good knowledge and average knowledge of practice regarding ACLS after STP. Thus, the STP was effective.

FUTURE SCOPE:

NURSING IMPLICATION: The findings of this study have implications for nursing practice, nursing education, nursing administration and nursing research.

NURSING PRACTICE:

The nursing staffs hold a great responsibilities in saving life of the patient especially in the emergency condition for that each a nurse requires a specialized knowledge and skill in handling those conditions. Regular refresher training can be continued in the hospital for all health care personnel.

NURSING ADMINISTRATION:

The finding of the study will help the nurse administrator to organize more workshops, Mack drill, and short term refresher courses for nurses.

NURSING RESEARCH:

Researchers suggest that Good quality Advanced cardiac Life Support (ACLS) results in better survival. Advance cardiac Life Support is an essential skill that all professional nurses need to have. All nursing personals are taught Cardio-Pulmonary Resuscitation (CPR) during their professional training and also during the orientation programme prior to induction as a staff nurse.

REFERENCES:

1. Hamilton.R. Assessment of knowledge and skill retention following cardio pulmonary resuscitation training.new ham university hospital:NHS trust,uk;Aug2005.(288-95)
2. weiebe.T.Should critical care nurses be ADVANCED CARDIAC LIFE SUPPORT trained Hagyard,weibe T: Health science centre,Winnipeg;2007.(28-31)
3. Journal of the Hong Kong Medical Association. Advanced cardiac life supporting (ACLS) by nurses and The Medico legal Position in Hong Kong; Vol. 38 No. 1, 1987.
4. Heart Rhythm Foundation, sudden cardiac arrest key facts <http://www.heartrhythmfoundation.org/facts/scd.asp>.
5. JAMA The journal of the American Medical Association Available URL on <http://www.kmcmamaa.org/CARDIO.doc>.
6. Available URL on <http://ezinearticles.com/?The-Differences-Between-BLS-and-ACLS-Training&id=7170322>.
7. Journal of the Hong Kong Medical Association. Advanced cardiac life supporting (ACLS) by nurses and The Medico legal Position in Hong Kong; Vol. 38 No. 1, 1987.
8. Hamilton.R.Nurses' Knowledge and skill retention following cardiopulmonary resuscitation training: a review of the literature;journal of advanced nursing;2005. Aug-51(3):288-97.
9. Available URL on <http://www.expresshealthcaremgmt.com/20041215/criticare06.shtml>
10. Available URL on <http://www.thehindu.com/2007/10/28/stories/2007102853800400.htm>
11. Philip Jevon. Advanced cardiac life support a practical guide, printed by Elsevier science;2002.
12. Woods Susan L, Erika S.Sivarajan, Froelicher, Sandra Underhill motzer & Elizabeth j.bridges, cardiac nursing.Fifth edition, Lippincott:Philadelphia;2005.
13. Borimnejad L,Rasouli M. BorimnejadV. Samiee S. Emam Khomeini Hospital Rafsanjan Pulmonary Resuscitation Outcome in Frequency of Some of factors Affecting Adults Cardio University of medical Sciences;2004. 4(4):24-29.
14. Monsieus KG.De Regge M. Vogels C. Calle PA. Circulation: Improved BLS performance by ward nurses Philadelphia;2005. 67(1):45-50.
15. Mayanlambam P.Devi AM.Knowledge and practice regarding basic life support among nursing students.Int J Res Rev;2016. 3(1):43-47.
16. Anil Kumar Parashar. Effective Planned Teaching Programme on Knowledge & Practice of Basic Life Support among Students in Mangalore: The Nursing Journal of India;February2010.(Feb. Vol. C1 No. 2.)
17. Goswami R.Kanika, Sembian N.Effectiveness of Training Program on Knowledge and Practices Regarding Basic Life Support (BLS) Among Nursing Students. Int J Clin Anesthesiol: Maharishi Markandeshwar College of Nursing, India; 2015.3(2):1046.
18. NMF Filho. AC Bandeira. T Delmondes. Assessment of the general knowledge of emergency physicians from hospitals of the city of Salvador (Brazil) on the care of cardiac arrest patients. Care and Emergency Medicine Critical Care;2007.
19. Viva J. Siddall, Monica J. Fudala. Mastery learning of advanced cardiac life support skills by internal medicine residents using simulation technology and deliberate practice. Journal of General Internal Medicin; March, 2006. (Volume 2, P251-6.)
20. Boonmak P.Boonmak S. Srichaipanha S.Poomsawat S. Knowledge and skill after brief ACLS training; J Med Assoc Thai; 2004. (Nov; V.87(11), P1311-4.)
21. O'Steen DS. Kee CC. Minick MP. The retention of advanced cardiac life support knowledge among registered nurses: J Nurs Staff Dev; 1996. (Mar-Apr; V.12 (2), P66-72.)