

Narrative Review On First Aid Knowledge And Practice Among Undergraduate Students

Prof. Sheuli Sen¹,

Sumandeep Nursing College, SVDU; Prof. (Dr) A.Tamilselvi², Amity College of Nursing, AUH

Abstract

Introduction

First Aid is the initial, immediate, life in curve rendered to an injured or sick person in life threatening situations by taking effective action to keep the injured or ill person alive in the best possible condition till emergency medical services and treatment can be obtained. First aid training among students is as an important capacity building component of pre-hospital care in communities.

Aim: This literature review aimed to determine whether the published literature demonstrates the knowledge & skills about first aid and CPR in cases of emergency life saving skills developed by under graduate students who have learnt first aid from first aid providers.

Methods

An extensive search and numerous evaluation of the peer-reviewed literature was conducted for narrative review. Journal articles were retrieved from three databases (MEDLINE, CINAHL, ERIC) using the search terms ‘first aid’; ‘resuscitation’; ‘training’; ‘under graduate students’; and ‘college’. Inclusion and exclusion criteria were applied and review findings organized thematically.

Results

The search yielded four primary studies of India & other countries under graduate students aged 18–23 years trained by professional first aid providers. Subsequent review identified emergent themes of resuscitative first aid and non-resuscitative first aid. Heterogeneity was apparent in training and evaluation methods, and study quality varied. Reported first aid knowledge retention was mixed.

Conclusion

There is a lack of quality evidence to guide optimal training methods and maximize first aid knowledge retention in under graduate college students. To date, research in this area has been limited. Further research is therefore recommended. Formal evaluation of first aid training providers can help guide training methods and maximize first aid knowledge retention in under graduate college students, thereby building more robust first aid capacity in the community.

Keywords:

First aid training, Knowledge retention, Basic life support (BLS), Cardio pulmonary resuscitation (CPR)

Introduction

Once life begins, instincts begin to work and also to preserve it. For life by itself strives to live and not to die^[1]. Among many challenges in life every individual 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. During medical emergency some deaths can be prevented by our careful interference like death due to cardiac arrest can be prevented by giving cardio pulmonary resuscitation (CPR) a basic life support (BLS) in time. 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.

It is important that all adolescence in school and college students should have gain as well as retain knowledge & practice in the BLS skills to save lives and improve the quality of the community's health.^[2,3,4,5,6]

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 programs 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.

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^[7]

A study on a recommendation for improving CPR skill among 268 non health professionals at New Jersey, found lack of knowledge to perform CPR in them.^[8] However, 78.3% of people are shown interest in learning CPR skills.

Narrative Review On First Aid Knowledge And Practice Among Undergraduate Students

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 skills, but implementation & retention is still lacking.^[9]

This literature review aimed to determine whether the published literature demonstrates the knowledge & skills about First Aid and CPR in cases of emergency lifesaving skills developed by under graduate students who have learnt first aid from first aid training provided by the teachers.

Methods

A search of peer-reviewed & grey literature is conducted in March 2020 to facilitate a narrative review. This narrative review of the literature is carried out according to the review principles and methods to provide transparency and minimize potential bias in the selection and review process.

Search strategy

The MEDLINE, Cumulative Index of Nursing and Allied Health Literature (CINAHL) and Education Resource Information Centre (ERIC) databases were searched to retrieve articles from key words, title and abstract and the search terms ‘first aid’; ‘resuscitation’; ‘training’; ‘under graduate students’; and ‘college’. Full-text articles are subsequently reviewed after initial screening of abstracts found to be of relevance.

Table 1. Databases and search terms

Database	Search terms
MEDLINE	‘first aid’ OR ‘resuscitation’ AND
CINAHL	‘training’ AND ‘under graduate*’ OR
ERIC	‘college’

Inclusion/exclusion criteria, quality appraisal and synthesis

Articles were included only if they were peer-reviewed, published in English and relevant to the stated review objective. No date restrictions are applied. Articles were excluded where their focus was specifically on mental health first aid. While these guidelines do not formulate a quality ranking, they do provide a sound and reliable framework from which to gauge the rigor, believability and robustness of empirical studies. All papers were analyzed thematically to synthesize and summarize the current body of knowledge, identifying gaps in the literature.

Results

Table 2 outlines the four primary studies that were included and reviewed. A range of training methodologies and evaluation strategies were reported across the studies – originating from India (n=3), Jordan (n=2), Saudi Arabia (n=3), UAE (n=1), Malaysia (n= 1), Spain (n-1) and the Pakistan (n=1); they encompassed both quantitative research designs. The quality of studies also varied considerably, though none were assessed to be inadequate. The age of under graduate students represented in study samples ranged from 18–23 years. The studies differed largely in their context and objectives. They also varied with respect to whether the first aid training involved CPR or whether it was non-resuscitative in nature, focusing on treatment of injuries or emergency helping behaviors. The two themes ‘resuscitative first aid training’ and ‘non-resuscitative first aid training’ were identified.

Table 2: Studies of professional BLS and first aid training for under graduate college students

Narrative Review On First Aid Knowledge And Practice Among Undergraduate Students

Authors	Country	Study designs/ Methods	Sample	Results	Comments
Ashendra Kumar Goduhan et al (2017) ^[1]	India	A before and after quasi experimental interventional study	1500 students	All the students performed correctly in all the areas of CPR technique after intervention.	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
Alaa O Oteir et.al (2019) ^[10]	Jordan	A cross-sectional study assessing CPR Knowledge among AHP students. The survey had two sections, including demographics and knowledge questions.	883 students	A total of 883 students the mean age was 21 A total of 693 (78.5%) students did not receive previous CPR training and the top barriers to receiving CPR training were unawareness of training opportunities and a lack of time. Participants had a mean CPR knowledge score of 3.9 (\pm 1.7) out of 10 maximum potential points. Trained participants had a higher mean score compared with the untrained	There is poor knowledge of CPR among AHP students including trained individuals. Efforts to increase the awareness of CPR should target students and professionals who are highly likely to encounter patients requiring CPR. Compulsory training courses, shorter training periods as well as recurrent and regular refreshing courses and use of various media devices are recommended.
Arjyal B et al (2019) ^[11]	India	Observational cross-sectional questionnaire based survey	250	It was observed that only 14% participants had previous BLS training.	Knowledge and awareness of basic life support skills among the various staffs was mostly below average to poor.

					Significant amount of cost effective BLS trainings must be conducted to develop competent staffs by various training centers
Awais Ahmad,et..el, 2018 ^[12]	Saudi Arabia	A self-administered survey questionnaire using cross-sectional design was employed.	360 college students	Out of 360 participants their mean score was 7.83 out of 14. About 28% participants had received BLS training previously during their study course and showed better BLS knowledge in comparison with the other participants.	Majority of the students with incomplete knowledge of BLS (CPR). The outcomes of this study will be helpful for education and healthcare service providers of the Saudi kingdom as a whole and for Jazan region.
Shahabe A. Saquib et.al (2019) ^[13]	Saudi Arabia	A cross-sectional study was conducted by administering self-explanatory questionnaire, comprising of 15 questions, was designed for the study.	865 UG intern students	Out of 865 subjects, 698 completed the survey. Mean score about the awareness and knowledge of BLS and other emergency services among the participants was 2.74±1.02	Among the participants the overall awareness score was average, whereas the knowledge score was below average. Further, the participants showed a positive attitude toward BLS training. An optimistic decision should be considered on the inclusion of Basic Life Support procedures in the university curriculum.
Asad Abba et.al (2011) ^[8]	Pakistan	The survey was conducted through group administration separately for all	250 medical students.	Amongst the trained students 99 (79.2%) had been trained at their respective medical	Knowledge of trained students better than those of untrained students yet the mean of trained students was less than 50% which is

Narrative Review On First Aid Knowledge And Practice Among Undergraduate Students

		the years. A pre-tested self-administered questionnaire was used for data collection to assess the knowledge of students regarding administration of First-Aid in different situations		colleges. The correct responses by the trained students were significantly better than untrained students regarding CPR,	not satisfactory. In order to improve the knowledge of medical students on first aid, their knowledge should be reinforced every year.
Khushboo Gupta et.al (2019) ^[14]	Malaysia	A cross-sectional study with 15 closed ended questions.	222 UG students from the faculty of Medicine, Dentistry and Pharmacy	Medical students manage to record the correctly and answered question in comparison to dental and pharmacy students. There is a significant difference in terms of knowledge between the 3 faculties. However no significant difference in attitude among the students from the 3 faculty	First Aid Knowledge amongst health science students in AIMST can be improved. The study also showed that the students have a positive attitude towards first aid.
Simy Mathew et al (2016) ^[15]	UAE	A cross sectional study with questionnaire with 17 objective questions on various emergencies	475 UG students	The overall mean correct response was 6.7 ± 2.6 out of 15. Mean score was highest for the students who belonged to College of Dentistry 8.3 ± 2.4 . Significant difference was seen amongst students	The level of knowledge and awareness of first aid is not satisfactory among AUST students, which emphasizes the need for compulsory first aid training program with practical activities

				who had taken first aid course previously when compared to those who had not. The level of knowledge and awareness of first aid is not satisfactory among AUST students, which emphasizes the need for compulsory first aid training program with practical activities	
Raneem moutlaq Alsayali et.al (2019) ^[16]	Saudi Arabia	Awareness, knowledge, attitude and practices of first aid skills among medical and non-medical students at Taif University	500 UG medical and non-medical students	The mean age of the participants was 21 ± 1.5 years. 56.6% of the participants were found to have good awareness regarding first aid and Basic life Support (BLS). The attitude towards first aid was very poor and only 8% had a good attitude toward it..	The attitude and skills of the study participants were not satisfactory. Universities need to organize an effective committee to monitor and conduct first aid courses and activities. Students need to realize the public importance of such activities and ensure they effectively involve in these lifesaving procedures
Silvia Aranda-Garcí et al (2019) ^[17]	Spain	Basic Life-Support Learning in Undergraduate Students of Sports Sciences: Efficacy of 150 Minutes of Training and Retention after Eight Months.	162 undergraduate students of Physical Activity and Sports Science degree	After training 8 months their performance of the BLS sequence and two minutes of cardiopulmonary resuscitation (CPR) improved significantly by correct hand position and chest compression.	Participants learned BLS and good-quality CPR after the 150-min training session. At eight months they had good retention of the BLS sequence and CPR skills. Training on airway management and the position of the hands during CPR should be reinforced

Narrative Review On First Aid Knowledge And Practice Among Undergraduate Students

Moawiah Khatatbeh (2016) ^[18]	Jordan	A cross-sectional study was conducted among university students in the large public university	1500 UG students from the total 14 colleges at Yarmouk University, Jordan	The 11% of students knew the normal respiration rate of an adult in 1 min. Results revealed that students, having previous first aid experience, and being a student of the health sciences only had significant level of first aid knowledge.	The students' knowledge about first aid is not at an adequate level. It would be advisable that first aid course be handled as a separate and practical course at secondary school level.
Joseph N et.al (2014) ^[19]	India	This cross-sectional study was conducted. A self-administered anonymous multiple choice questionnaire was used for data collection to assess the knowledge of students regarding administration of first aid in different situations.	152 UG medical students	Only 11.2% (17/152) of the total student participants had previous exposure to first aid training. Good knowledge about first aid was observed in 13.8% (21/152), moderate knowledge in 68.4% (104/152) and poor knowledge in 17.8% (27/152) participants.	The level of knowledge about first aid was not good among majority of the students. The study also identified the key areas in which first aid knowledge was lacking. There is thus a need for formal first aid training to be introduced in the medical curriculum

Discussion

This review sought to determine to what extent the literature demonstrates that first aid knowledge is retained by under graduate college students who have undertaken first aid training from professional providers. Overall, it is apparent that different approaches have yielded different results within a variety of samples. ^[2,3,4,20,21] **Pande S et al (2014)**^[22] in an experimental study on 42 first year MBBS students in Nagpur, Maharashtra, found significant increase in the mean post test 1 score compared with the mean pretest score (7.42, 1.10 vs. 3.42 2.34). Although the mean posttest 2 score (5.38, 1.16) was lower than that for posttest 1, it was still higher than the mean pretest score. The feedback perceptions of students indicated that BLS helped them gain a higher level of knowledge questionnaire, a lecture, a demonstration, and hands-on training using a mannequin.

The above mentioned systematic review of literature in table 2 has revealed that demonstration method of teaching the basic life support (BLS) is one of the best methods of imparting knowledge & developing skill. But to have a best experience in terms to gain knowledge and practice is to enrich the skill based on the concept of Bloom's revised taxonomy that indicate creating, evaluating, analyzing, applying, understanding and remembering.

Rachula Daniel, et al (2018)^[23] noted that simulation-based teaching on BLS has an effect on improving the knowledge and skills in BLS among 85 students.

Numerous studies revealed that **reinforced training program** with practical activities on BLS to be carried out at a frequent interval of time in order to retain the knowledge and practice as well. The application of the concept of the Miller's Pyramid of Competency evaluation through Performance is going to be rightly fit for enhancing practical learning skill with retention of knowledge and practice as it is explained elaborately in Fig-1.

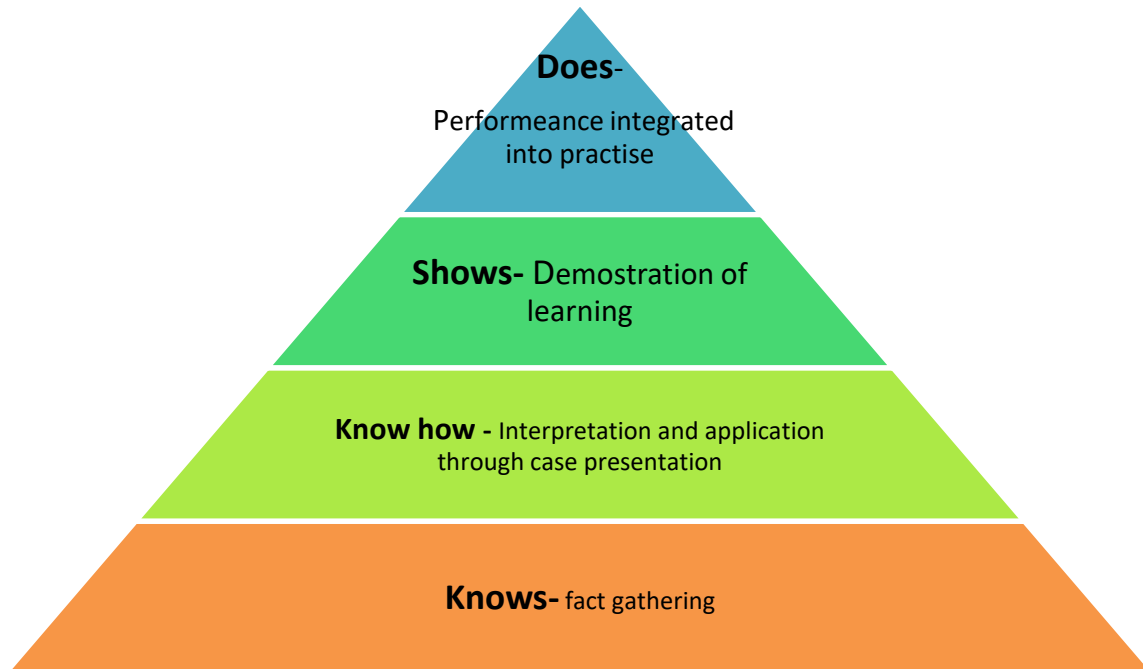


Fig 1 : The Miller's Pyramid of Competency evaluation through Performance

Jamaludin T, et. al (2018) ^[24] noted that majority of students had inadequate level of first aid knowledge, awareness and attitude towards its practice. 94% of students agreed that it was very important for them to learn first aid, and most wanted to learn more despite their lack of knowledge, lack of training, inappropriate instruction, limited practice, lack of self-efficacy, and poor skill retention contribute to the inadequate knowledge & skills of basic life saving.

Asad Abbas, et. al (2011)^[25] noted that although the knowledge of trained students was found to be better than those of untrained students yet the mean of trained students was less than 50%

which is not satisfactory. In order to improve the knowledge of medical students on first aid, their knowledge should be reinforced every year

Another study in the systematic review has revealed that practical course on first aid {FA} management at secondary school level has to be introduced. In India this practical course in the curriculum does not exist. The curriculum is only based on theoretical knowledge without any periodic training & evaluation of the practical skill.

A study conducted by **Bondhopadhy et al, 2017**^[26] in Hooghly District, West Bengal where baseline knowledge on the management of selected injuries was found to be insufficient among the study subjects. There was a significant change in knowledge from pretest score to posttest score. Significant change was noticed regarding attitude and regarding first aid as evident from increase in pretest score (mean = 1.19, SD = 0.96) to posttest score (mean = 3.17, SD = 1.03) Inculcating first-aid training in the school curriculum can be a fruitful investment in ensuring proper and timely management of illnesses and injuries not only for the school children but also for the community at large

Amal Salem Alhejaili et al (2016)^[27] study showed that inadequate knowledge about first aid among the female students. Health science students at Taibah University need first aid training program in their curriculum to improve the basic skill about it.

Al-Khamees et al (2006)^[21] results showed a close correlation between knowledge and attitude. More training and coursework in first aid at Kuwait University appears to be warranted, with males and those in "literary" colleges especially targeted.

Pande S,et al (2014)^[22] revealed that formal first aid training to be introduced in the course curriculum itself. Study evaluated the of retention of knowledge and skills imparted to first-year medical students through basic life support training. The entire procedure consisted of training, assessment of knowledge of students by a pretest. Perceptions of students indicated that BLS helped them gain a higher level of knowledge questionnaire, a lecture, a demonstration, and hands-on training using a mannequin and introduction of FA &BLS in the course curriculum with periodic evaluation.

The review of literature (ROL) was limited to knowledge and practice of First Aid and basic life support (FA & BLS) among under graduates students in assessing the actual gain in knowledge and practice because majority of the ROL has been done in assessing the knowledge & expressed practice which is always not accurate to evaluate the actual gain in practice skill. A limited number of ROL showed that the evaluation of knowledge and practice has been done based on demonstration & simulation method an actual gain in knowledge & practice in FA & BLS.^[27,28,29,30,31,32] Very few literatures has done repeated post test at a frequent interval of time to evaluate the actual gain in knowledge and practice which in turn has helped in retention of knowledge and practice of FA & BLS among undergraduates.

This review of the literature was limited to the research and grey literature published in English. Furthermore, cultural factors may need to be considered as the reported studies from India

involved only samples of undergraduate college students. In India the FA & BLS is not included in the curriculum of non medical courses. In the medical and paramedical courses it is included but periodic reinforcement of this FA & BLS training and evaluation does not take place in each year of promotion to next semester though it is the most important parameter of life saving aspect at the primary level. Future research might usefully explore potential considerations for the provision of first aid training to minority groups such as people with disabilities, or those from Indigenous or culturally and linguistically diverse backgrounds.

Conclusion

Due to the heterogeneity of training programs and study designs reported in the research literature, there is an overall lack of definitive evidence. Evidence from studies suggest that knowledge retention generally increases with reinforcement of training at a frequent interval of time with repeated posttest and the inclusion of practical training, though variation in research design, methodological rigor and overall quality of studies prevents sound conclusions. Further longitudinal research is needed to evaluate and inform the growing provision of first aid training both in this context and for sub-populations who may present unique considerations.

Conflicts of Interest

The author declares that they have no conflicts of interest

Funding

The author declares that there was no funding source.

Acknowledgement

I am thankful to my PhD guide for her academic support and guidance.

REFERENCES

1. Ashendra Kumar Goduhan, Ashok Y. Kshirsagar, et al. 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. *International Journal of Science and Research* 2015; 1-12.
2. Kaye W, Rallis SF, Mancini ME, et al. The problem of poor retention of cardiopulmonary resuscitation skills may lie with the instructor, not the learner or the curriculum. *Resuscitation* 1991; 21:67–87.
3. Metin CM, Mutlu C. Level of knowledge about first aid of the university students. *Trakia J Sci* 2010;8:262-5.
4. Sharma S. Knowledge of first aid among undergraduate students of KMC, Mangalore. *New Indian J Surg* 2011;2:315.
5. Almoammar NA, Fathalla A, Alotaibi FF, Alshahrani KM, Alanazi AM, Alqarni A ,et al. Assessing The Level of First-Aid Knowledge Among Undergraduate Medical Students in King Saud University. *International Journal of Pharmaceutical Research & Allied Sciences*. 2018; 7(1):58-63.

6. Markenson D, Ferguson J, Chameides L et al. American Heart Association and American Red Cross guidelines for first aid 2010. *Journal of the American Heart Association*. 2010; 122:934-946.
7. Gupta L.C. and Gupta A. *Manual of First aid*, New Delhi: Jaypee Brothers, 2000
8. Asad Abbas, Syeda Ismat Bukhari et al., "Knowledge of first aid and basic life support amongst medical students: a comparison between trained and un-trained students", *Journal of the Pakistan Medical Association*, vol. 61, pp. 2-5, 2011.
9. *Instructor manual for BLS, AHA*, 2000.
10. Alaa O Oteir, Khader A Almhdawai, et al. Cardiopulmonary resuscitation level of knowledge among allied health university students in Jordan : A cross-sectional study. *BMJ Open* 2019; 1-9.
11. Arjyal B, et al. Knowledge and Awareness of Basic Life Support among medical staffs of birat medical college and teaching hospital. *Birat Journal of Health Sciences* 4 (2019); 666-670
12. Awais Ahmad et al. Knowledge of basic life support among the students of Jazan University, Saudi Arabia: Is it adequate to save a life? *Alexandria Journal of Medicine* 54 (2018); 555-559
13. Shahabe A. Saquib et al., "Knowledge and Attitude about Basic Life Support and Emergency Medical Services amongst Healthcare interns in university hospitals: A cross-Sectional Study", *Emergency Medicine International*, pp. 1-8, 2019.
14. Khushboo Gupta, Saurabh Singh, et al. A comparative evaluation of first aid knowledge and attitude among medical, dental and pharmacy students in AIMST University, Malaysia. *International Journal of Applied Dental Sciences*. 2019; 5(3): 91-95.
15. Simy Mathew, Parsa Salman, et al. Awareness of First Aid Among Undergraduate Students in Ajman, UAE. *Journal of Dental and Medical Sciences*. Volume 15, Issue 6 Ver. XIV 2016, pp 30-38.
16. Raneem moutlaq Alsayali, Anood Qalil Awwad Althubaiti et al., Awareness, knowledge, attitude and practices of first aid skills among medical and non-medical students at Taif University. *Journal of family medicine* vol 17 (11): 2019, pg 34-43.
17. Silvia Aranda-García , Ernesto Herrera-Pedroviejo, et al. Basic Life-Support Learning in Undergraduate Students of Sports Sciences: Efficacy of 150 Minutes of Training and Retention after Eight Months. *International journal of environment and public health*. 2019; pg-2-11.
18. Moawiah Khatatbeh. *First Aid Knowledge among University Students in Jordan*. *International Journal of Preventive Medicine* 2016.
19. Joseph N, Kumar GS et al. Knowledge of First Aid Skills Among Students of a Medical College in Mangalore City of South India. *Annals of Medical and Health Sciences Research* 2014; Vol 4.162-166.
20. González-Salvado, V.; Abelairas-Gómez, C.; Peña-Gil, C.; Neuro-Rey, C.; Barcala-Furelos, R.; González-Juanatey, J.R.; Rodríguez-Núñez, A. Basic life support training into cardiac rehabilitation programs: A chance to give back. A community intervention controlled manikin study. *Resuscitation* 2018, 127, 14–20.
21. Al-Khamees N. A field study of first aid knowledge and attitudes of college students in Kuwait University. *College Student Journal Publisher*. 2006; 40:E197500.

22. S.Pande, S. Pande, V. Parate et al. Evaluation of retention of knowledge and skills imparted to first-year medical students through basic life support training. *American Journal of Physiology-Advances in Physiology Education*. Vol 38 (1) 2014, pg 42-45.
23. Danial Ruchal et.al. Impact of simulation-based basic life support training among the medical students. *National Journal of Physiology, Pharmacy & Pharmacology*. Vol 8 (12) 2018, pg 1635-1640
24. Thandar Soe Sumaiyah Jamaludin¹, Muhammad Allif Bin Zakaria. et al. A Literature Review On Knowledge, Awareness and Attitude Related To First Aid Among University Students. *Scholars Journal of Applied Medical Sciences (SJAMS)*. 2018; 6(7), pg 2660-2664.
25. Abbas A, Bukhari SI, Ahmad F. Knowledge of first aid and basic life support amongst medical students: a comparison between trained and un-trained students. *J Pak Med Assoc* 2011;61:613–6.
26. Lina Bandyopadhyay et al. Effectiveness of first-aid training on school students in Singur Block of Hooghly District, West Bengal. *Journal of Family Medicine and Primary Care*. (2017); 6(1), pg 39-42
27. Alhejaili AS, Alsubhi SA. Knowledge and attitude of first aid skills among health science students at Taibah University. *J Gen Pract* 2016;4:257-62.
28. A. R. Aroor, R. P. Saya, N. R. Attar, G. K. Saya, and M. Ravinanthanan, “Awareness about basic life support and emergency medical services and its associated factors among students in a tertiary care hospital in South India,” *Journal of Emergencies, Trauma, and Shock*, vol. 7, no. 3, pp. 166–169, 2014.
29. A. Alanazi, M. Alsalmeh, O. Alsomali, A. M. Almurshdi, A. Alabdali, M. Al-Sulami et al., “Poor basic life support awareness among medical and College of Applied Medical Sciences students necessitates the need for improvement in standards of BLS training and assessment for future health care providers,” *Middle-East Journal of Scientific Research*, vol. 21, pp. 848–854, 2014.
30. Khan A, Shaikh S, Shuaib F, Sattar A, Samani SA, Shabbir Q, et al. Knowledge attitude and practices of undergraduate students regarding first aid measures. *J Pak Med Assoc* 2010; 60:68-72.
31. Swetha C, Suchitra MN, Sahana BN. A study on assessment of knowledge attitude and practices regarding first aid among nursing students. *International Journal of Current Research*. 2015;7(6):1673-5.
32. Khan, A., Shaikh, S., Shuaib, F., Sattar, A., Samani, S., Shabbir, Q., Rasheed, A. Knowledge attitude and practices of undergraduate students regarding first aid measures. *Journal of the Pakistan Medical Association*. 2010;60(1), 68-72.