A Study to Assess the Effectiveness of Simulation in terms of Knowledge and Skill Regarding Basic Life Support (BLS) Among Non-Medical Faculty. - A Narrative Review.

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Abstract Cardiac arrest, (is also known as circulatory arrest) is the cessation of normal circulation of the blood due to failure of the heart to contract effectively. Arrested blood circulation prevents delivery of oxygen to the body. Lack of oxygen to the brain causes loss of consciousness, which then result in abnormal or absent breathing. When unexpected cardiac arrest leads to death this is called sudden cardiac death. The treatment for cardiac arrest is cardiopulmonary resuscitation (CPR) to provide circulatory support. The aim of this narrative review is to find information on the effectiveness of simulation in terms of knowledge and skill regarding basic life support among non-medical faculty (participants). Intervention-Simulation on Basic life support method was used in the study. Quasi experimental study with skill lab of College was used in the study. This narrative review result has appeared that simulation will be effective for acquiring knowledge and skills on basic life support.

Keywords Basic Life Support; Knowledge; simulation; Non Medical Faculty.

1. Introduction

Cardiovascular disease is the leading global cause of death, accounting for more than 17.9 million deaths per year in 2015, a number that is expected to grow to more than 23.6 million by 2030. The majority of Out of Hospital Cardiac Arrests (OHCA) occurs at public settings (39.5 percent). In 2015, home or residence (27.5 percent) and nursing homes (18.2 percent) were the second and third most common locations of OHCA (WHOSIS) 2017.

BLS is an evolving life-saving technique of modern medicine that comprises a series of life-saving actions that is useful in cardiac arrest. It consists of chest compression and rescue breaths which re-establish oxygenated blood flow to the vital organs of an individual who has suffered cardiac arrest. BLS can be administered by a trained person before the arrival of emergency medical services; this skill must be acquired by all adults, since many sudden cardiac arrest occurred outside the hospital
setting. The most important actions that have been proven to significantly reduce mortality rates is considered to be the more basic actions of BLS, known as high quality chest compression. Other actions within the CPR realm, such as advanced life support (ALS) (administering medications, ventilation, intubation, intravenous fluids etc.); have also shown to have a significant effect on reducing mortality rates in SCA if BLS is initiated early. Thus, BLS is considered to be the foundation to save lives following sudden cardiac arrest (SCA) (Olatunji, 2019).

A Quantitative research was conducted by Sansari and Susan et al. (2017) on Effect of basic life support training program on knowledge and practice by using quasi-experimental one group pre-test post design. Sample of 60 administrative employees were selected for study by using Non-probability sampling technique. The mean knowledge score of subjects in pre-test was 4.90 and in post-test was 9.78 and total means score of subjects in pre-test was 3 and in post-test 16.15. Positive response to the demonstration and teaching was found equal and really useful to administrative employees who will help them to take quick decisions, perform cardiopulmonary resuscitation and save many lives of cardiac arrest victims outside the hospital.

A quasi experimental study was conducted by Tobase et al. (2017), using before and after design. Sample size was 62. An online course on basic life support was designed and administered on undergraduate nursing students. Practical evaluation of simulated activity. The electronic records system from the immediate feedback device was used. Theoretical learning was evaluated by means of a pre- and post-test and, to evaluate the practice, simulation with immediate feedback devices was used. Sample size was 62, with a mean age of 21.47. Mean scores in the pre-test was 6.4 and 9.3 in the post-test in practice. As a result, showed an increase in the mean score of the post test, which shows high significant learning, was gained. Study also suggested the use of simulation with high fidelity simulators and feedback devices for quality learning. Improvement in resuscitation were also identified when using feedback devices on training of lay person.

An experimental study was conducted by Dannie and Evangeline (2018) on impact of simulation based basic life support training among medical students. Sample size was 85 undergraduate medical students. Statistics shows significant difference in pre and post test score. As a result, a study has proven that simulation based basic life support plays significant role for acquiring knowledge and skills.

A quasi experimental study was conducted on Effect of 3 basic life support training on future primary school teachers by Navarro-Patonaet al. (2018) by using non probability sampling without control group. Sample size was 124 students with no previous knowledge of basic life support. Audio-visual aids and immediate feedback devices were used for training. As a result, teaching course using feedback devices shows the best results in terms of the quality of chest compressions, followed by the traditional course and audio-visual approach. These favorable results were present in both male and female.

A randomized control trial on simulation versus standard training for medical student was conducted by Eric McCoy et al. (2019). Sample size of the study was 74 and they were divided into two groups, on group for simulation and other for standard training. The use of high-fidelity simulation has also shown benefit in CPR knowledge, skills, acquisition, retention, and advanced resuscitation in the disciplines of nursing and pharmacy. An early systematic review and meta-analysis evaluating simulation technology for resuscitation training recommend that simulation-based training for resuscitation is highly effective.

A Quasi-experimental interventional study was conducted by Goduhan et al. (2015) on to find out the Effectiveness of Basic Life Support Training on Knowledge of Life Saving Skills among College student. Total 1500 sample were included in this study and grouped in three divisions according to
their knowledge scores as poor, good and excellent. Scores was obtained from pre and post training assessment where 883 participants in the poor category who all improved skills after training as in the post test results none of them found in poor category. There were only eight participants in the excellent category before intervention which increased to 1188 in excellent group of knowledge after training intervention. As a result, planned teaching and demonstration is great solution for improving knowledge, about CPR in cases of emergency and lifesaving situations.

Figure 2: Prisma flow diagram of narrative review

2. Findings

The systematic search was conducted by formulating the terms separately and in integration with all synonyms, also according to the database. Likewise, a manual Google scholar search was undertaken using the keywords and search synonyms from already articles. An addition of 6 articles was found in the database. Initial search recovers 1000 articles over which 200 articles were selected manually. 100 articles were rejected as a result of replication in the database. Replication was removed and reviewed 100 articles for acceptability. 94 more studies were rejected because of unreachable of the full text. Hence, 6 articles were screened which includes quantitative study.
3. Discussion

These findings are supported by a study conducted by Maria Pichel-aquasi-experimental study with no control group, reported that simple training program for school teachers were able to perform the BLS sequence and to produce chest compression with a quality similar to that obtained by staff with a duty to assist cardiac arrest victim. Result suggests that training for non-medical faculty on BLS, which is significant to be able to train student as well as they will be able to take prompt decision and perform CPR in outside hospital cardiac arrest.

4. Conclusion

Systematic review and meta-analysis evaluating simulation technology for resuscitation training recommend that simulation-based training for resuscitation is highly effective. There was a significant change in mortality rate outside hospital cardiac arrest thus it is effective methods for acquiring skill and knowledge for BLS. Therefore, this intervention should be encouraged for non-medical faculty.

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Conflict of Interest

Nil

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