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Review Article

To study the knowledge regarding basic life support among college students: A review study

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ABSTRACT:
Every Nursing students in India have to undergo a compulsory rotatory internship for completion of their course where they encounter various medical emergencies and apply their medical knowledge. An early encounter to a basic life support course and training will increase the efficacy of cardiopulmonary resuscitation and thus the outcome of the patient. The research is now ongoing, and the empirical evaluation of knowledge and practise of basic life support knowledge and attitude among college students, will be valuable to society. As a consequence, a study to measure teens' knowledge and attitudes about basic life support is required.

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INTRODUCTION

Cardiopulmonary resuscitation (CPR) is a group of interventions used to keep the body oxygenated and circulated during a cardiac arrest. Our current modern approach to this process evolved from the work of a few doctors in the 1950s to the process that will be discussed further here. The American Heart Association's standards are the most commonly recognised in North America (AHA). These are published every five years following the meeting of the International Liaison Committee on Resuscitation (ILCOR). [1]

Early CPR can increase the chances of survival. Because perfusion during CPR is dependent on chest compressions, they are an extremely important component of CPR. As a result, when beginning CPR in an adult victim of sudden cardiac arrest, chest compressions should be the highest priority and the first action. High-quality CPR is essential not only at the beginning but also throughout the course of resuscitation.

CPR for adults entails chest compressions between 5 cm (2.0 in) and 6 cm (2.4 in) deep and at a rate of at least 100 to 120 compressions per minute.[2] The rescuer may also administer artificial ventilation by either exhaling air into the subject's mouth or nose (mouth-to-mouth resuscitation) or by employing a device that pumps air into the subject's lungs (lung-pump resuscitation) (mechanical ventilation). Current guidelines prioritise early and high-quality chest compressions over artificial ventilation; for novice rescuers, a simpler CPR procedure including simply chest compressions is advised. [3] However, according to 2015 American Heart Association recommendations, administering solely compressions may result in poorer results in children, since such difficulties in children often stem from pulmonary issues rather than cardiac ones, given their young age. [2] In adults, the chest compression to breathing ratio is fixed at 30 to 2.

CPR is unlikely to restart the heart on its own. Its primary goal is to reestablish a partial flow of oxygenated blood to the brain and heart. The goal is to postpone tissue death and increase the limited window of opportunity for effective resuscitation without causing lasting brain damage. Defibrillation, or administering an electric shock to the subject's heart, is frequently required to restore a viable, or "perfusing," heart beat. Defibrillation is only successful for particular heart rhythms, such as ventricular fibrillation or pulseless ventricular tachycardia, as opposed to asystole or pulseless

electrical activity, which typically requires the treatment of underlying problems to restore cardiac function. When necessary, early shock is advised. CPR may be successful in creating a shockable heart rhythm. CPR is often maintained until the victim has a return of spontaneous circulation (ROSC) or is confirmed dead. [4]

STUDY AREA

This study was done in the Department of nursing, Malwanchal university, Indore, Madhya Pradesh.

ETIOLOGY

Every year, about 350,000 Americans die as a result of heart disease. Half of these people will die unexpectedly, outside of a hospital, as a result of the abrupt loss of spontaneous organised cardiac action. Ventricular fibrillation is the most prevalent cause of sudden cardiac arrest in adults. Despite breakthroughs in emergency cardiac care that are increasing survival rates, sudden cardiac arrest remains a top cause of mortality in many regions of the globe. In 2016, heart disease was the top cause of death in the United States.

EPIDEMIOLOGY

Seventy percent of cardiac arrests outside of a hospital happen at home. Half of these cardiac arrests are unwitnessed. Despite breakthroughs in emergency medical treatment, the rate of survival remains poor. Adult victims of non-traumatic cardiac arrest who get resuscitation efforts by emergency medical personnel have a 10.8 percent chance of surviving until hospital release. Adult patients experiencing cardiac arrest in a hospital environment, on the other hand, have rates of survival until hospital release of up to 25.5 percent. [5]

PATHOPHYSIOLOGY

Electrical defibrillation is the only effective therapy for ventricular fibrillation. The most common method is to use an automatic external defibrillator (AED). Brain death is likely to occur in less than 10 minutes if an AED is not quickly accessible for defibrillation. CPR is a technique for delivering artificial circulation and breathing until defibrillation is possible. When performed correctly, conventional manual CPR, which combines chest compressions with rescue breathing, may deliver up to 33% of normal cardiac output and oxygenation. [6]

CRP TECHNIQUES

The American Heart Association and the International Liaison Committee on Resuscitation revised its CPR recommendations in 2010. The significance of high-quality CPR (adequate rate and depth without over-ventilating) was underlined. [7] Except for neonates, the sequence of interventions was modified from airway, breathing, chest compressions (ABC) to chest compressions, airway, breathing (CAB). [7] Those suspected of being in respiratory arrest are exempt from this suggestion (airway obstruction, drug overdose, etc.). [7] The most crucial aspects of CPR are: minimum interruptions of chest compressions, adequate compression speed and depth, totally relieving pressure between compressions, and not breathing excessively. It is unknown if a few minutes of CPR before to defibrillation has different effects than instantaneous defibrillation. [8]

COMPRESSIONS COMBINED WITH RESCUE BREATHS

Chest compressions and ventilations are used in standard CPR. The compressions are applied to the bone in the centre of the victim's chest (sternum), and the ventilations are performed by squeezing the victim's nose and breathing air mouth-to-mouth. If the victim is a baby, the ventilations would cover the infant's mouth and nose at the same time. A general compression-to-ventilation ratio of 30:2 is advised for all victims of any age (30 rhythmic compressions before each 2 ventilations). [9] If at least two trained rescuers are present and the victim is a child, a compression-to-ventilation ratio of 15:2 is preferred instead of the standard 30:2.[9] In addition, according to the AHA 2015 Guidelines, the ratio in infants is 30:2 with one rescuer present and 15:2 with two rescuers present.[9] Artificial ventilation should proceed without interruptions in compressions with advanced airway treatments, such as an endotracheal tube or laryngeal mask airway, at a rate of 1 breath every 6 to 8 seconds (8-10 ventilations per minute). The compression speed in all of the victims is at least 100 compressions per minute.[9] The recommended compression depth for adults, children, and newborns is 5 cm (2 inches) (1.6 inches).[9] For adults, rescuers should use two hands (one on top of the other) for chest compressions, although for youngsters, one hand is sufficient, and for newborns, only two fingers are required.[10] There are certain plastic shields and respirators that may be used in rescue breaths between the lips of the rescuer and the sufferer to seal a better vacuum and prevent infections.

ONLY COMPRESSION

Compression-only (hands-only or cardiocerebral resuscitation) CPR, which includes chest compressions without mechanical ventilation, is advised for unskilled rescuers or those who are not competent since it is simpler to do and instructions are easier to deliver over the phone.[11] Compression-only CPR performed by the general public had an equal or greater success rate than conventional CPR in people experiencing out-of-hospital cardiac arrest. It is thought that using compression-only delivery would enhance the likelihood of ordinary people doing CPR. [11] Compression-only CPR is less effective in youngsters, who are more prone to suffer cardiac arrest due to respiratory reasons. Two studies

concluded that compression-only CPR was no more effective than no CPR at all. [12] Rescue breaths for children, particularly newborns, should be somewhat soft. For youngsters, a compression-to-breath ratio of 30:2 or 15:2 was shown to provide superior benefits. Children and adults should each get 100 compressions per minute. Aside from children, other exclusions include drownings and drug overdoses. [12]

CPR ON THE PRONE

CPR is often administered with the victim supine. Prone CPR, often known as reverse CPR, is administered on a sufferer who is resting on their chest in a prone posture. Turning the head to the side and squeezing the back does this. The risk of vomiting and consequences from aspiration pneumonia may be minimised if the head is moved. [13] The current American Heart Association recommendation is to do CPR in the supine position, with prone CPR reserved for circumstances when the patient cannot be turned. [13]

MANAGEMENT / TREATMENT

It is critical to recognise cardiac arrest as soon as possible in order to activate the emergency medical services (EMS) response and begin CPR. It is now feasible to contact 911 while being with the victim in this age of ubiquitous mobile phone access. Check that the situation is safe before calling for assistance. Begin CPR by first administering chest compressions (C), then opening the airway (A), and last providing rescue breaths (B) (the CAB sequence as compared to the former ABC sequence). Hands are placed on the lower part of the sternum, and compressions of the chest are started at a pace of 100 to 120 compressions per minute. The aim is to depress the sternum to at least two inches while avoiding excessive compression depths. To maintain coronary artery perfusion pressure, the chest wall should be allowed to completely recoil on the upstroke. [14] compressions are carried out, followed by a short rest for two rescue breaths. Because of the crucial importance of chest compressions to coronary artery perfusion, pauses in chest compressions should be kept to a minimum and as brief as feasible when necessary. [15,16]

The rescuer conducts a head tilt/chin lift procedure after 30 chest compressions to free the airway (assuming there is no suspicion of a cervical spinal injury). If a cervical spine injury is suspected, the airway is opened without extending the head using the jaw-thrust procedure. The rescuer takes a "normal" breath (not deep or excessive) and then administers a rescue breath lasting roughly one second, which should be enough to enable the chest to rise. Before continuing chest compressions, the procedure is repeated for a second rescue breath.

A healthcare practitioner who is willing to act as an out-of-hospital rescuer should ideally have fast access to a barrier device such as a rescue mask. This, however, is not always the case. The alternative has been mouth-to-mouth rescue breaths, which many unskilled rescuers are unwilling to administer, particularly on an unknown victim. Healthcare providers must make this choice for themselves. For inexperienced lay rescuers, compression-only CPR has been approved. If extenuating circumstances prevent an out-of-hospital healthcare professional from delivering rescue breathing without a barrier device, compression-only CPR should be done until EMS arrives. [17]

The cycle of 30 chest compressions followed by two rescue breaths is repeated until an AED is available or other aid arrives. If an AED comes, its pads should be put to the patient's front and back, taking care to avoid any delay in commencing chest compressions. Most newer devices provide spoken instructions—after being hooked to the patient, AEDs detect the present cardiac rhythm and indicate if defibrillation is necessary. If the AED recommends a shock, stop compressions and keep away from the patient until defibrillation is complete. After defibrillation, or if no shock is suggested, immediately continue cycles of chest compressions and rescue breaths according to the CAB protocol until more aid arrives. [17]

CONCLUSION

Without a doubt, boosting the incidence of bystander CPR might significantly improve the survival rate of OHCA patients. However, we must first raise awareness and understanding of basic life support among health care professionals, and then in their communities. BLS is one of the vital services that every nursing practitioner owes to society. The research is now ongoing, and the empirical evaluation of knowledge and practise of basic life support knowledge and attitude among college students will be valuable to society. As a consequence, a study to measure teens' knowledge and attitudes about basic life support is required.

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