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Assessment of Nurses knowledge Regarding Cardio-Pulmonary Resuscitation in Atbara Hospital (2021)

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الآيـة

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قال تعالى :

﴿ رَبِّ أَوْزِعْنِي أَنْ أَشْكُرَ نِعْمَتَكَ الَّتِي أَنْعَمْتَ عَلَيَّ وَعَلَى وَالِدَيَّ وَأَنْ أَعْمَلَ صَالِحًا تَرْضَاهُ وَأَدْخِلْنِي بِرَحْمَتِكَ فِي عِبَادِكَ الصَّالِحِينَ ﴾

صدق الله العظيم

سورة النمل - الآيـة (19)

Dedication

I have dedicated this research to our dear parents

Who gave us all efforts and facilities to our study from childhood until adulthood.

To all our teachers:

Who are teaching us giving without take and patience without tedium.

Also I would like to dedicate it to our remaining brothers and sisters for their continuous assistance and help.

To all our friends:

Those whom precede us and no longer with us,

Those whom precede us and are still among us,

Those with us,

And to those who will follow us.

Acknowledgment

First the greatest thanks to God Almighty

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For her support, guidance and patience,

thanks a lot for her.

Finally I would like to thank all of

the people who helped us in this research

ملخص الدراسة

المقدمة : الإنعاش القلبي الرئوي هو الإجراء الطارئ المستخدم لإنقاذ ضحايا الصدمة القلبية والجهاز التنفسي, وينبغي أن يتم بشكل عاجل جدا لتجنب التلف الدائم للدماغ أو حتى الموت، إذ أن المريض يعيش من4 إلى 6 دقائق دون أوكسجين.

نوع الدراسة: أجريت هذه الدراسة الوصفية في مستشفي عطبرة التعليمي في الفترة من يونيو وإلي سبتمبر 2021 شملت الدراسة كل الممرضين العاملين في عناية الباطنية المكثفة والعناية المكثفة للقلب وعددهم ستون. تم جمع البيانات باستخدام استبيان قياسي مغلق الأسئلة مكون من أربعة أجزاء، بعد جمع البيانات تم تحليلها باستخدام برنامج التحليل الحزمي للبيانات بالحاسوب.

الأهداف: أجريت الدراسة بغرض تقييم معرفة الممرضين في عملية الإنعاش القلبي الرئوي في مستشفى عطبرة التعليمي.

النتائج : توصلت الدراسة إلى أن الغالبية (95٪) من الممرضين لديهم معرفة جيدة فيما يتعلق باستخدام الأدوية الشائعة في الإنعاش القلبي الرئوي، و (90٪) لديهم معرفة جيدة فيما يتعلق بالطريقة المفضلة للتحقق من تنفس الشخص الفاقد الوعي.
وأكثر من الثلثين (75٪) لديهم معرفة ضعيفة بموضع اليد الصحيح لإجراء الإنعاش القلبي الرئوي ، في حين أن ما يقرب من ثلثيهم (58.3) لديهم معرفة ضعيفة بالإجراء الأولي عندما لا يرتفع الصدر.

التوصيات : توصلت الدراسة إلى عدة توصيات تمثلت في تفعيل السمنارات وورش العمل والتدريب المنتظم حول الإنعاش القلبي الرئوي وأوصت أيضاً بالتعليم الذاتي للممرضين.

Abstract

Background: Cardiopulmonary resuscitation (CPR) is the emergency procedure used to salvage victims of cardiac and respiratory arrest. It should be carried out with great urgency to avoid permanent brain damage or even death that would result if the victim stays from 4 to 6 minutes without oxygen.

Study design: Descriptive, hospital-based study, was conducted in Atbara city in Atbara teaching hospital, was carried out at the period from June to September 2021, study covered all nurse's in hospital who work in ICU and CCU they were 60 nurse, standard closed ended questioner was been used to data collection. The collected data was analyzed by using Computer software SPSS program.

Objective : To assess knowledge and performance regarding cardiopulmonary resuscitation among nurses in Atbara teaching hospital.

Result: Majority (95%) of study group have Good knowledge regarding common drugs use in cardiopulmonary resuscitation, and (90%) of study group have Good knowledge regarding the preferred way to check collapse person breathing.

More than two third (75%) of study group had poor knowledge about the correct hand placement to perform CPR, While near to two third (58.3) of them had poor knowledge about first action when chest does rise.

Recommendations: Study recommended that Regular courses and seminars should be conducted for cardiopulmonary resuscitation, also recommended with self learning of nurses.

Abbreviation

CPR	Cardiopulmonary resuscitation
EMS	Emergency medical system
ACLS	Advanced cardiovascular life support
BCLS	Basic cardiac life support
AHA	American heart association
BLS	Basic life support
AED	Automated external defibrillator
ICU	Intensive care unit
CCU	Coronary care unit
ED	Emergency department
PEA	Pulse less electrical activity
VT	Ventricular tachycardia
VF	Ventricular fibrillation
WHO	World Health Organization
IV	Intravenous
ABCD	Airway, breathing, circulation, defibrillation
DNR	Do-not-resuscitate
DRABC	Danger, Response, Airway, breathing, circulation
SCA	Sudden cardiac arrest
PVT	Pulse less Ventricular tachycardia
ET	Endotracheal
ECG	Electrocardiogram
PICU	Pediatric intensive care unit
NICU	Neonatal intensive care unit

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Chapter One

<u>Introduction</u>

<u>Research problem</u>

<u>Justification</u>

<u>Objectives</u>

1.1Introduction

Abrupt cessation of an effective cardiovascular circulation results in sudden collapse, Unconsciousness and loss of vital signs. This condition is known as “cardiac arrest”. Mortality is 100% if no treatment is given. One of the defining characteristics of emergency physicians is their ability to recognize and manage the undifferentiated patient in cardiac or respiratory arrest [(1).]

The World Health Organization (WHO) estimates that 17 million people died in 2010 from cardiopulmonary diseases, which are consequently classified as the leading causes of death among all non-communicable diseases [(2).] Rapid initiation of basic CPR, rapid defibrillation and Advanced Cardiovascular Life Support (ACLS), including definitive airway management and intravenous (IV) medications. These steps are known as the “chain of survival” [(3).]

Cardiopulmonary resuscitation (CPR) is an important medical procedure which is needed for individuals who face sudden cardiac arrest. It is a combination of rescue breathing and chest compressions which is delivered to the victims who are thought to be in cardiac arrest [(4).] It is reduces in-hospital cardiac arrests and related deaths, when patients receive CPR promptly from adequately trained and specialized health care professionals [(2).]

Emergency practitioners must be experts in understanding the path physiology of Cardiopulmonary arrest and the principles behind the resuscitation of these patients With cardiopulmonary resuscitation (CPR. [(3).]

. The Journal of the American Medical Association reported that for patients who have CPR started within 4 minutes of arrest and ACLS within 8 minutes, successful resuscitation is increased to 43 % [(3).]

Modern cardiopulmonary resuscitation (CPR) began in the late 1950s with the rediscovery of closed chest cardiac massage and mouth-to-mouth ventilation. Advances in external defibrillation and other non-invasive techniques improved success rates of resuscitation and increased the number of individuals who could be adequately trained to immediately provide these interventions [(3).]

In 2010, the American Heart Association (AHA) changed the guidelines for CPR. Whereas previously an “ABC” (airway, breathing, circulation) approach was recommended, the current recommendations are for a “CAB” (circulation, airway, and breathing) approach [(5)]

This change was made in response to studies that showed that the amount of oxygen in a person s blood at the time of collapse is sufficient to sustain basic processes until emergency help arrives, and that better outcomes are achieved by circulating the blood first (as opposed to oxygenating blood that is not being circulated throughout the body). In addition to compressions first, the new AHA guidelines for CPR call for faster and deeper compressions [(5).]

1.2 Research problem

Cessation of pulse and breathing is emergent health problem inside and outside hospital which require adequate knowledge and skill to preserve victim life in every limited time nurses are the most medical personal who or responding of monitoring and preserving patients life so assessing nursing knowledge in performing CPR procedure will give glue and feedback about to how extent they are skill and up to date to the latest international guide line regarding CPR.

According to the World Health Organization (WHO) in 2008, 17 million people (48% of all deaths) died due to cardiovascular diseases, and mainly because of cardiac arrest [(6).] It has been documented that 33% to 40% of cardiac arrests in developed countries occur in the hospital setting, and of the arrests that occur in the hospital setting more than 60% are first recognized by nurses (WHO, 2009) [(7).]

1.3 Justification

CPR can be life-saving first aid and increases the persons chances of survival if started soon after the heart has stopped beating. If no CPR is performed, it only takes three to four minutes for the person to become brain dead due to a lack of oxygen [8]. and it is vital procedure which saves the patient life if it applies by proper technique and lead to many complication if it occur by wrong way, so that the nurse plays a vital role in the efforts to resuscitate a patient [9]. Therefore the researcher need to conduct this research to identify nurses knowledge regarding Cardio-Pulmonary Resuscitation.

1.4 Objective

1.4.1. General objective:

-To assess nurses knowledge regarding cardiopulmonary resuscitation

1.4.2. Specific objective:

-To identify nurses knowledge regarding general information of cardiopulmonary resuscitation, include (definition, complication, high quality CPR and When stop CPR).

-To identify nurses knowledge regarding cardiopulmonary resuscitation technique (Airway, Breathing, Circulation), defibrillation and medication use in cardiopulmonary resuscitation.

-To find out the association between the knowledge scores of the nurses regarding technique of CPR and years of experience.

Chapter Two

Literature Review

2 Literature review

2.1 Cardiac arrest:

Sudden cardiac arrest (SCA) is defined as cessation of cardiac mechanical activity and it is a clinical diagnosis, confirmed by unresponsiveness, absence of detectable pulse and apnea or agonal respirations [(10)(11).]

2.2 Causes of cardiac arrest:

A cardiac arrest can be caused by many things and causes tend to differ from adults to children, for adults, they may comprise Heart disease the most common cause of reversible adult cardiac arrest (70%), trauma and respiratory illness hanging [(8).]

The most common non-perfusing arrhythmias include the ventricular fibrillation (VF), pulseless ventricular tachycardia (VT), pulseless electrical activity (PEA), asystole and pulseless bradycardia [(3).]

2.3 Pathophysiology:

Cardiac arrest results in cessation of blood flow throughout the body. Anaerobic metabolism begins almost immediately. A cascade of metabolic events is created, including calcium release, generation of free radicals, and activation of catabolic enzymes that further injure the body's cells [(3).]

Within 15 seconds of cardiac arrest, the patient loses consciousness, electroencephalogram becomes flat after 30 seconds, pupils dilate fully after 60 seconds and cerebral damage takes place within 90-300 seconds. Therefore, it is essential to act immediately as reversible damage can occur in a short time [(11).]

The brain is most susceptible to the absence of circulation and traditionally suffers irreversible damage after 5 minutes in an arrest state. Restoration of pre-arrest neurologic function rarely occurs in patients with untreated cardiac arrest of longer than 10 minutes duration [(12).]

The heart is the second most susceptible organ. Patients who suffer cardiac arrest from a non cardiac cause remain at risk for secondary cardiac ischemia in the post-resuscitation period. CPR, even utilizing maximal chest compressions, can only generate 30% of baseline cardiac output. The resuscitation period, therefore, still contributes to ongoing global ischemia [(12).]

The goal of CPR is to preferentially direct blood flow to the heart and brain in order to adequately restore organized myocardial electrical activity while minimizing ischemic brain injury [3].

There are two main theories to explain how this happens. In the cardiac compression model, the heart is squeezed between the sternum and the thoracic spine creating a pressure gradient between the ventricles and the great vessels [3].

This causes blood to flow into the systemic and pulmonary arterial circulation. In the thoracic pump model, chest compressions cause a rise in the intra thoracic pressure that creates a pressure gradient between the intra thoracic vascular bed and the extra thoracic arterial bed, which causes blood to flow down the pressure gradient [3].

2.4 Cardiopulmonary resuscitation (CPR):

It is important to provide effective cardiopulmonary resuscitation care to arrested patients to improve mortality and morbidity rates [8]. CPR cannot usually restart the heart, but it makes sure that blood and oxygen continue to circulate through the body, keeping the patient active until help arrives [13].

Because of the nature of their profession, nurses spend significant time alongside patients and are often the first to Attend at in-hospital cardiovascular arrests; they are thus the ones who respond by providing CPR the nurse plays a vital role in the efforts to resuscitate a patient [14]. The ABCDs of basic cardiopulmonary resuscitation (CPR) are airway, breathing, circulation, and defibrillation [8].

Cardiopulmonary resuscitation (CPR): The manual application of chest compressions and ventilations to patients in cardiac arrest, This procedure is an essential component of basic life support (BLS), basic cardiac life support (BCLS), and advanced cardiac life support (ACLS) [15][16].

Also known by the acronym CPR is an emergency procedure that is performed in an effort to manually preserve intact of brain function until further measures can be taken to restore spontaneous blood circulation and breathing in the person who is experiencing the sudden cardiac arrest (SCA) [17][18].

And (CPR) is the foundational technique for the emergency treatment of sudden cardiac arrest (SCA) [(19).]

2.5 Goal of CPR:

The goal of CPR is to ensure that body functions are maintained so that the brain and other vital organs receive a sufficient supply of oxygen and nutrients to maintain their functions and that the waste products of metabolism are removed [(12).]

For the purpose of optimal performance, it is ideal to provide standardized equipment and regular trainings based on international guidelines [(20).]
The goal of resuscitation is restoration of normal or near-normal cardiopulmonary function, without deterioration of other organ systems [(21).]

2.6 Indication of CPR:

CPR should be performed immediately on any person who has become unconscious and is found to be pulseless [(22).]
Cardiac arrest is often caused by the ventricular fibrillation (VF). When VF develops heart will not pump blood. The victim in VF cardiac arrest needs CPR [(23).] The indication for CPR is usually ventricular fibrillation (73%) or ventricular tachycardia 24% [(24)(25).]

It has also been stated that CPR is indicated for the victims who develop cardiac arrest for any reason without delay [(26).] always be alert whenever any victim suffers dysrhythmias, hypovolemic shock anaphylaxis may need CPR if condition worsens [(27)]

2.7 Contraindications:

The only absolute contraindication to CPR is a do-not-resuscitate (DNR) order or other advanced directive indicating a person's desire to not be resuscitated in the event of cardiac arrest. A relative contraindication to performing CPR is if a clinician justifiably feels that the 27minute would be medically futile [(28).]

2.8 Complications of CPR:

The chest compression related injuries are common even with proper chest compressions or Excessively vigorous compression over xyphoid process can result in rib separation, rib fracture, air or blood in chest cavity, bruised lung laceration of liver, lungs and spleen. They insisted that these complications can be prevented or minimized by following a proper CPR technique [29][30][31].

2.9 Role of the nurses regarding the CPR :

Sudden cardiac arrest is a leading cause of death [32]. A Being at the heart of the health care delivery is an enormous challenge for nursing, but it is also a golden opportunity to save the life of the patient. A high level of knowledge and skills of CPR is expected from the whole nursing staff to save the lives of the victims of cardiac arrest [33].

The fact that patient survival depends on competent and immediate initiation of CPR following cardiac arrest, it is essential that all nurses should have the sound skill and knowledge to perform CPR as and when necessary [34].

2.10 Metrics for High-Quality CPR:

A number of key components have been defined for high-quality CPR, including minimizing interruptions in chest compressions, providing compressions of adequate rate and depth, avoiding leaning on the chest between compressions, and avoiding excessive ventilation [35].

However, controlled studies are relatively lacking, and observational evidence is at times conflicting. The effect of individual CPR quality metrics or interventions is difficult to evaluate because so many happen concurrently and may interact with each other in their effect [36][37].

Compression rate and compression depth, for example, have both been associated with better outcomes, yet these variables have been found to be inversely correlated with each other so that improving one may worsen the other [36][37].

2.11 Outcome of CPR:

CPR is the artificial method of circulating blood and oxygen through the body and attempting to keep the brain alive in a patient with cardiac arrest. If the CPR is

initiated within 4 minutes of cardiac arrest, the survival rate is 43 percent; when initiated within 4-8 minutes the survival rate is only 10 percent [38].

2.12 Stopping CPR:

When the person is revived and starts breathing on their own, medical help arrive to take over the person and performing the CPR is forced to stop from physical exhaustion [8].

Stopping CPR if there is no response or return spontaneous cardiac output (palpable pulse) after 20 – 30 minutes, may stop after 15 minutes of a systole, ongoing evaluation and discussion with team, if prognosis uncertain [30].

2.13 Termination of efforts:

Despite our best efforts, some patients cannot be resuscitated. The decision to terminate efforts at saving a life can be a difficult one. Many factors need to be considered, including time to the initiation of CPR, time to defibrillation, co-morbid disease, age of the patient, initial rhythm, quality of life prior to the arrest, and expected quality of life if resuscitated. The most important prognostic factor is the duration of cardiac arrest. The chance of being discharged from the hospital alive [3].

2.14 The primary survey:

The Primary Survey, or initial assessment, is designed to help the emergency responder detect immediate threats to life. Immediate life threats typically involve the patient's ABCs, and each is correct as it is found [39].

The simplest and most familiar approach follows the concept of the primary and secondary surveys, and utilizes the ABCs (Airway, Breathing, Circulation) as a reminder person collapses, possible cardiac arrest, assess responsiveness, un-responsive, not breathing, no pulse, ventricular fibrillation (VF)/ ventricular tachycardia (VT) non-VF/VT, CPR for1 minute, CPR up to 3minutes, activate emergency response system, call for defibrillator, **A** Assess breathing (open airway, look, listen, and feel), **B** Give two slow breaths, **C** Assess pulse, if no pulse → **C** Start chest compressions and **D** Attach monitor/defibrillator when available [3].

Life threatening problems must be identified first. This is to be completed in an order of priority to ensure the most important steps are undertaken in a logical order ensuring nothing is missed. This systematic approach uses the acronym DRABC [39].

D: Danger:

Always make sure that both you, the casualty and any bystanders are safe before you proceed [39][40].

R: Response:

Gently shake the casualties shoulders and call out “are you alright”. If they respond, do not move them but find out what is wrong and treat. If there is no response shout for “help” and move on to the next step [39][40].

Airway:

The first step to assessing the patient’s airway is to look for respiratory activity, listen for breathing, and feel for air exchange at the patient’s nose and mouth. If these are present, assess the patient’s ability to protect the airway by asking them to speak [3].

If the patient can speak, immediate definitive airway management is not likely needed. If the patient does not respond to questions, the absence of a strong gag reflex confirms the inadequacy of protective airway mechanisms, once you have established that the patient is not breathing or unable to protect the airway, steps must be taken to provide airway support [3].

If you are alone in the room, immediately call for assistance and then place the patient in a supine position [3].

Carefully check that the casualties airway is open by putting one hand on their forehead and gently tilt the head back. Place two fingers on their chin and gently lift the chin to open the airway [39][40].

One must be careful in a patient who is suspected of having neck trauma to maintain in-line stabilization of the cervical spine. This is performed by keeping one hand behind the head and neck while the other hand rolls the patient toward you.

Once the patient is correctly positioned on his/her back, open the airway. An unresponsive or unconscious patient will have decreased muscle tone, allowing the tongue and epiglottis to fall back and obstruct the pharynx and larynx [3].

In order to correctly position the head and open the airway of the patient without suspected traumatic injury, use the head tilt-chin lift maneuver. If standing on the patient's right side, place the left hand on the patient's forehead and the fingers of the right hand under the bony part of the chin. Simultaneously apply firm backward pressure on the forehead tilting the head back and lifting the chin up and forward. Open the patient's mouth to prepare for ventilation. If there is visible foreign material in the airway, it should be removed or suctioned away [3].

If there is the possibility of neck trauma, the head tilt-chin lift maneuver could cause cervical spine injury if the neck is hyper-extended. In such cases, the jaw thrust maneuver should be utilized. To perform this maneuver, position yourself at the patients head. Place your thumbs on the zygomatic arches on either side of the face. Grasp the angles of the victims lower jaw with your remaining fingers, and lift the lower jaw up and forward. Visible foreign material in the airway should be removed or suctioned away [3].

Breathing:

Most victims suffering from cardiopulmonary arrest will not breathe spontaneously. After positioning the head and opening the airway, one should quickly assess for chest excursion and the presence of exhalation[3], Look for chest movements, listen for breathing sounds and feel for breath on your cheek. If you can not detect normal breathing perform CPR [40].

If the patient is not breathing nor has inadequate respirations, assist the patient with artificial respiration. In the emergency department (ED) setting, a bag-valve mask device should be readily available [3].

Utilizing the same technique as the jaw thrust maneuver for opening the airway, squeeze the mask between your thumbs and your remaining fingers as you lift the jaw [3].

This will create an airtight seal while another rescuer provides rescue breathing through compression of the bag. If you are alone, apply the mask to the patient's face. Place the middle, ring, and little fingers of one hand along the bony

portion of the mandible, and place the thumb and index finger of the same hand on the mask. Squeeze the mask between your fingers on to the patient's face to create an airtight seal. Compress the bag with your other hand. Provide rescue breaths of 2 seconds duration while watching for chest rise [3].

If you do not see the chest rise or find it difficult to compress air from the bag into the patient's airway, reposition the head and mask and try again [3][41].

If subsequent attempts to ventilate the patient are unsuccessful, the patient may have an obstructed airway. Open the patient's mouth by grasping both the tongue and the lower jaw between the thumb and fingers, and then lift the mandible. If you see obstructing material, use a McGill forceps or clamp to remove it. If this equipment is not available, slide your index finger down the inside of the cheek to the base of the tongue and dislodge any foreign bodies using a hooking action. Use caution to avoid pushing any obstructing material further down the airway [3].

If you still cannot effectively administer rescue breathing and suspect an obstructed airway, perform abdominal thrusts. These abdominal thrusts elevate the diaphragm and increase airway pressure. The resulting air escape from the lungs can effectively dislodge an obstructing foreign body from the upper airway [3].

To perform this maneuver, place the heel of one hand against the patient's abdomen just above the navel and well below the xiphoid process. Place your other hand on top of the first. Press both hands into the abdomen five times in a quick upward-thrusting motion maintaining a midline position. Then, reattempt ventilation [3].

Excessive ventilation is unnecessary and can cause gastric inflation, regurgitation, and aspiration. Excessive ventilation can also be harmful by increasing intrathoracic pressure, decreasing venous return to the heart, and diminishing cardiac output and survival [42].

Circulation:

In the patient with suspected cardiopulmonary arrest, one should check for a carotid pulse, as this is the most central of the peripheral arteries [3].

A carotid pulse may persist even in the presence of poor perfusion. If no pulse is present, chest compressions should be initiated and the patient should be placed on a cardiac monitor. To adequately perform chest compressions, the heel of

one hand should be placed in the midline on the lower part of the sternum (just above the notch where the ribs meet the lower sternum). The other hand is placed on top of the first hand and the fingers interlocked and kept off of the chest. Position your shoulders directly over your hands and lock your elbows [(3).]

Depress the sternum about 1.5-2 inches approximately 100 times per minute, while allowing another member of the team to give rescue breathing after every five compressions. Properly performed compressions can produce a systolic blood pressure of 60mmHg [(3)(38).]

There is concern that delivery of chest compressions without assisted ventilation for prolonged periods could be less effective than conventional CPR (compressions plus breaths) because the arterial oxygen content will decrease as CPR duration increases. This concern is especially pertinent in the setting of asphyxial cardiac arrest [(43).]

2.15 The secondary survey:

The secondary survey uses the same mnemonic as the primary survey; however, the interventions are more involved and aggressive:

Airway:

End tracheal intubation is the most effective method of ensuring adequate ventilation, oxygenation, and airway protection against aspiration during cardiac arrest. In addition, it is an additional route of entry for some resuscitation medications, such as atropine, epinephrine, and lidocaine [(3).]

Breathing:

If the patient has been intubated in the pre-hospital setting, the adequacy of intubation should be checked by auscultation the chest for equal bilateral breath sounds, identifying fog in the end tracheal tube on exhalation, and monitoring end-tidal CO_2 [(3).]

The presence of exhaled CO_2 on a monitor indicates proper tracheal tube placement and can detect subsequent tube dislodgement. False readings can occur if CO_2 delivery is low in cardiac arrest patients due to low blood flow to the lungs. False

readings have also been reported in patients who ingested carbonated liquids prior to intubation [3].

A chest X-ray can help determine the location of the tip of the end tracheal tube in relation to the carina. The patient should be placed on a ventilator for positive pressure ventilation. Continuous high flow oxygen and pulse oximetry should be maintained [3].

Circulation:

Intravenous (IV) access should be obtained, preferably with a central venous catheter in the internal jugular, subclavian, or femoral vein. Two large bore peripheral lines may be acceptable and IV fluids should be infused. The patient's rhythm should be identified and appropriate interventions instituted based on accepted ACLS guidelines [3].

Defibrillation:

Cardiac arrest from a primary cardiac etiology typically presents as ventricular fibrillation (VF) or less often as pulse less ventricular tachycardia (VT). Both are treated identically [3][18].

Early defibrillation is the one intervention that has been shown to increase survival for patients in VF or pulse less VT.[3][18] When defibrillation can be successfully performed within the first minute or two, as many as 90% of patients return to their pre-arrest neurologic status [3].

The longer the patient remains in cardiac arrest, the more likely that defibrillation and resuscitation will be unsuccessful. Survival rates are _10% when defibrillation is delayed 10 minutes or more after a patient's collapse [3].

The term automatic external defibrillator (AED) refers to a sophisticated computerized device that incorporates a rhythm analysis system and a shock advisory system. AEDs are designed to recognize VF or VT and advise the user to deliver an electric shock to convert the non-per fusing rhythm to per fusing one [3].

Placing AEDs in public access areas like airports, sports stadiums, or restaurants allows quicker access to life-saving defibrillation, when police officers in Rochester, Minnesota were equipped with an AED, survival from out-of hospital VF averaged 50% with a median time from collapse to defibrillation of 5 minutes [3].

Similar statistics have been reported in public access trials in other states. These survival rates are twice those previously reported for the most effective emergency medical systems (EMS). Since survival from VF or pulse less VT is so time-sensitive, defibrillation in witnessed VF or pulse less VT should preclude any other type of evaluation [3].

Defibrillation should be attempted with up to three shocks as soon as the diagnosis is made . Using gel or defibrillation pads, one paddle should be placed to the right of the sternum below the right clavicle and the other in the mid axillaries line at the level of the nipple. Firm pressure of approximately 25 lb should be applied to each paddle. Alternatively, " hands off " defibrillator pads can be used that are placed on the chest and the back, sandwiching the heart [3].

Successful defibrillation depends on the amount of current transmitted across the heart. This is proportional to the energy output of the defibrillator and inversely proportional to the trans thoracic impedance, which depends on chest size, phase of respiration, and other variables [3].

Current defibrillators are monophonic and do not adjust for the trans thoracic impedance. The first biphasic waveform defibrillator was approved in 1996 [44].

While not used in all EDs worldwide, with biphasic current are also being used with several advantages. Standard manual chest compressions have been shown to be universally superior to alternative techniques [44].

The biphasic waveform adjusts for differences in trans thoracic impedance, allowing less energy requirements for successful defibrillation [3].

Along with CPR, early defibrillation is critical to survival when sudden cardiac arrest is caused by VF or pulseless VT (pVT) [45][46].

2.16 Drug using in Cardiopulmonary Resuscitation:

Adrenaline (epinephrine):

Adrenergic agonist; adrenaline (epinephrine) is routinely used to enhance cerebral and myocardial blood flow by preventing arterial collapse and by augmenting aortic diastolic pressure through alpha 1 and 2 receptors [9].

Its alpha adrenergic receptor stimulating properties improves coronary perfusion pressure, while its potentially harmful beta adrenergic effects primarily beta 1 actions (inotropic and chronotropic) result in increases in myocardial oxygen

consumption, in the incidence of ventricular arrhythmias, and intrapulmonary shunting due to reduced hypoxic pulmonary vasoconstriction (47).

Accordingly adrenaline increases myocardial lactate concentration and decreases myocardial ATP content (48).

Although beta 2 actions are predominantly bronchodilatory, its stimulation in the myocardium further increases oxygen consumption during CPR and the severity of myocardial ischemic injury after successful CPR (48).

Adrenaline has not been shown to improve outcome, although it is one of the mainly used vasopressors in the practice of advanced cardiac life support (ACLS). Standard optimal dose recommendation for intravenous adrenaline is 1 mg (10 ml of in 10000 solution or 1 ml of 1 in 1000 solution) every 3-5 minutes according to ACLS guidelines (49).

However, in the majority of cases adrenaline did not appear to be administered according to current ACLS guidelines. The median interval between adrenaline doses during CPR was 6.5 min (50).

Additionally, adrenaline is believed to stiffen the major vessels leading away from the heart, thus adding to the transmission of the raised intrathoracic pressure and the forward flow of the blood, which is known as the the chest pump theory (49).

If venous cannulation has not been achieved immediately, then adrenaline 2-3 mg diluted in 10 ml normal saline (0.9%) may be administered via the endotracheal (ET) route and followed by five ventilations to aid spread throughout the lungs (49).

Atropine:

Atropine Atropine enhances automacticity and conduction of both sinoatrial and atriventricular node. It is most effective in hemodynamically significant bradycardia due to vagal stimulation, the recommended dose in PEA associated with bradycardia (<60 beat/min) and asystole is 3 mg iv and 6 mg ET (1, 3). For the treatment of sinus bradycardia, 0.5 mg (approximately 10 µg kg-1) iv should be given and repeated if required up to a total dose of 40 µg kg-1 (9).

2.17 Post-resuscitation care:

More often than not, patients who have been resuscitated following cardiac arrest are hemodynamically unstable, ventilator-dependent and comatose, aggressive management post-resuscitation is essential to maximize their chances for recovery, the immediate goals for post-resuscitation care include the following list:

Provide cardio respiratory support to optimize tissue perfusion, especially to the brain, transport the patient to an appropriate intensive or critical care unit (ICU or CCU). If one is not available, the patient should be transferred to a tertiary institution that can provide critical care, continue efforts to identify the precipitating causes of the arrest and institute measures to prevent recurrence, including but not limited to maintenance of antiarrhythmic drips when appropriate [(3).]

All patients require a repeat thorough physical examination. Particular attention should be paid to the patient's cardiopulmonary status. A chest X-ray should be reviewed or obtained to confirm endotracheal tube position. Ventilator settings should be adjusted to the necessary level of mechanical support as determined by arterial blood gas values and the patient's spontaneous efforts. A 12-lead ECG should be repeated and compared to previous tracings [(3).]

Continuous cardiac monitoring must be maintained. In the hemodynamically unstable patient, assess circulating fluid volume, urine output, and ventricular function to determine the need for additional crystalloid replacement or vasopressor infusion, invasive hemodynamic monitoring, such as arterial lines and Swan Ganz catheters, should be considered, although controversy exists regardin the necessity of such monitoring in the ED, laboratory evaluations of electrolytes, cardiac markers, or drug levels should be reviewed, including the reassessment of the patient's acid-base status. All patients resuscitated from VF or VT should receive antiarrhythmic therapy during the first 24 hours post-resuscitation [(3).]

A significant amount of brain damage can occur when blood flow to the brain is re-established after resuscitation. This reperfusion injury involves many physiologic processes and is not completely understood. It is important to maintain blood pressure, acid-base status, oxygenation, and adequate sedation during the post-resuscitation period in order to improve long-term neurologic outcome [(3).]

Chapter Three

Methodology

3 Methodology

3.1 Study design:

A descriptive cross sectional . hospital based study was carried out at the period from June to September 2021.

3.2 Study area:

This study was carried out in Sudan -River Nile state - Atbara city ,which is located 310 km to Khartoum city . at the junction of the river Nile and Atbara river . Atbara city now is one of the rich cities in health care facilities; It contains five main hospitals: Atbara teaching hospital , Alsllam University hospital, military hospital, Police hospital , and health insurance hospital, it has also number of private medical centers for delivery of health care.

3.3 Setting:

This study was conducted in Atbara teaching hospital . It reference for medical and nursing students . It consist of the following parts : medicine wards, surgery wards , Obstetric and gynecological department , pediatrics wards , laboratory, dialysis department , intensive care unit (ICU), cardiac care unit (CCU), pediatric intensive care unit (PICU) and neonatal intensive care unit (NICU) .

ICU and CCU :

This unit was established since 2012 , it provides care for all patient from urban and rural ears . The average number of patients received in the ICU and CCU per day is about two to three patients . There is five medical officers and six consultants delivering care for patient at this unit .

This department consist of suction machine , monitors , beds, oxygen concentrator, Ambo bag and nebulizer machine, electrocardiogram (ECG), echocardiograph (Echo), DC Shock, infusion pump, syringe pump.

3.4 Study population:

It is include all nurses in Atbara hospital whom work in ICU and CCU during the time of study.

Inclusion criteria:

All nurses whom work in ICU and CCU during three shifts and work in other department they had experience.

Exclusion criteria:

Nurses in holiday and work in other department whom had not experience.

3.5 Sampling & Sample size:

Total coverage sample ,(60) nurses had been working in ICU and CCU, with various certificates of diploma, bachelor and master in nursing.

3.6 Data collection tools:

Data was collected by questionnaire closed ended questions, designed by researcher based on available Literature review it consist of four parts.

Part one: designed to collect data about Socio-demographic data (age, sex, years of experience, level of education). which contain four questions (1-4).

Part two: designed to collect data about general information of cardiopulmonary resuscitation, include (definition, complication, high quality CPR and When stop CPR). which contain four questions (5-8).

Part three: designed to collect data about cardiopulmonary resuscitation quality (Airway, Breathing, Circulation). which contain ten questions (9-18)

Part four: designed to collect data about defibrillation and medication use in cardiopulmonary resuscitation. which contain four questions(18-22)

Scoring system:

Scoring system was established by researcher, the data was distributed in two categories to measure the level of nurses knowledge regarding cardio-pulmonary resuscitation: if the nurse respond to correct answer consider good knowledge, if non respond to correct answer consider poor knowledge.

3.7 Data collection technique:

The data was collected during two week daily during three shift (morning – afternoon –night), Any participant filled all questionnaire by himself.

3.8 Data analysis:

The data was analyzed by using statistical package for social sciences (SPSS) and presented in form of tables and figures. And crosstabs (chi square) used to find out correlation between years of nurse experiences and knowledge of nurses regarding cardio-pulmonary resuscitation.

3.9 Ethical consideration:

The proposal was approved from the scientific committee board, and then permission was taken from general hospital manger and the head nurse to conduct the research.

The purpose of the study has been explained verbally clearly to participant and their information should be used for the purpose of study only and there have chance to continuous, or stopped at any time they wish.

Chapter Four

Results

4. Results

The study found that majority (91.7%) of nurses was female, (8.3%) was male, while the most of the nurses with vary educational level, (73.3%) of a nurse's had Bachelor degree, (6.7%) master degree and (20%) was diploma. (30.0%) of nurse's have less than one years, (38.3%) have (1-5) years, (31.7%) of nurse's have more than 5 years, while reported places of work (65%) of nurse's working in the intensive care unit (ICU) and (35%) working in cardiac care unit (CCU).

Regard the study showed that (75%) of nurse has good knowledge about definition of cardiopulmonary resuscitation, (25%) has Poor knowledge, while (83.3%) have a good knowledge about complication of CPR, (16.7%) have Poor knowledge, in addition (58.3%) of nurse's Good knowledge about assess quality CPR, (41.7%)ware Poor knowledge , and (70%)of nurse's Good knowledge about when can stop of CPR and(30%)ware Poor knowledge .

Also the study clarified (55%) of nurse's Good knowledge about how to open the airway, (45%) ware Poor knowledge, while (86.7%) of nurse' s Good knowledge about the optimum way to open a person's airway prior to giving them mouth to mouth ventilations , (31.3%) ware Poor knowledge, (58.3%) of nurse's Good knowledge about time of switch in High quality CPR, (41.7%) ware Poor Knowledge, while (90%) of nurse had Good knowledge about Check collapse person breathing , (10%) ware Poor knowledge, and (41.7%) of nurse had Good knowledge about The chest does not appear to rise, (58.3%) ware Poor knowledge.

In addition (73.3%) of nurse had Good knowledge about assess the pulse in collapse adult patient and (26.7%) ware Poor knowledge, (70%) of nurse had Good knowledge about The ratio of compression to breaths, (30%) ware Poor knowledge, while (25%) of nurse had Good knowledge about The correct hand placement to perform CPR, (75%) ware Poor knowledge, (55%) of nurse had Good knowledge about Chest compression during CPR , (45%) ware Poor knowledge, and (65%) of nurse had Good knowledge about The depth of chest compression during CPR, (35%) ware Poor knowledge.

The study found that (56.7%) of nurse had Good knowledge about Properly operating an AED during CPR, (43.3%) ware Poor knowledge, (58.3%) of nurse had Good knowledge about What to do after delivering a shock, (41.7%) ware Poor

knowledge, while (50%) of nurse had Good knowledge about Most common place of the AED pads in the adult, (50%) ware Poor knowledge, and (90%) of nurse had Good knowledge about Most Common drugs use in CPR, (5%) ware Poor knowledge.

This study reflect that relation between years of experience and knowledge of nurse about suspect a spinal injury in a victim who is unresponsive and not breathing was not significant, while the knowledge of nurse about the optimum way to open a person's airway prior to giving them mouth to mouth ventilations was not significant, in addition knowledge of nurse about suspect a spinal injury in a victim who is unresponsive and not breathing was not significant, while the knowledge of nurse about high quality CPR, the person who performing chest compression and other person performing breathing are switching was not significant, and the knowledge of nurse about the preferred way to check collapse person breathing was not significant.

This study showed that relation between Years of experience and knowledge of nurse about when you try to give an unresponsive adult a rescue breath and the chest does not appear to rise was significant, while the knowledge of nurse about how to assess the pulse in collapse adult patient was not significant, also the knowledge of nurse about the ratio of compression to breaths when performing cardiopulmonary resuscitation(CPR) was not significant, and the knowledge of nurse about the correct hand placement to perform CPR was not significant.

Also the study clarified the relation between Years of experience and knowledge of nurse about chest compression during CPR was not significant, while the knowledge of nurse about the depth of chest compression during CPR was significant, in addition the knowledge of nurse about properly operating an AED was not significant, while the knowledge of nurse about most common place of the AED pads in the adult was not significant, and the knowledge of nurse about common drugs use in CPR was not significant.

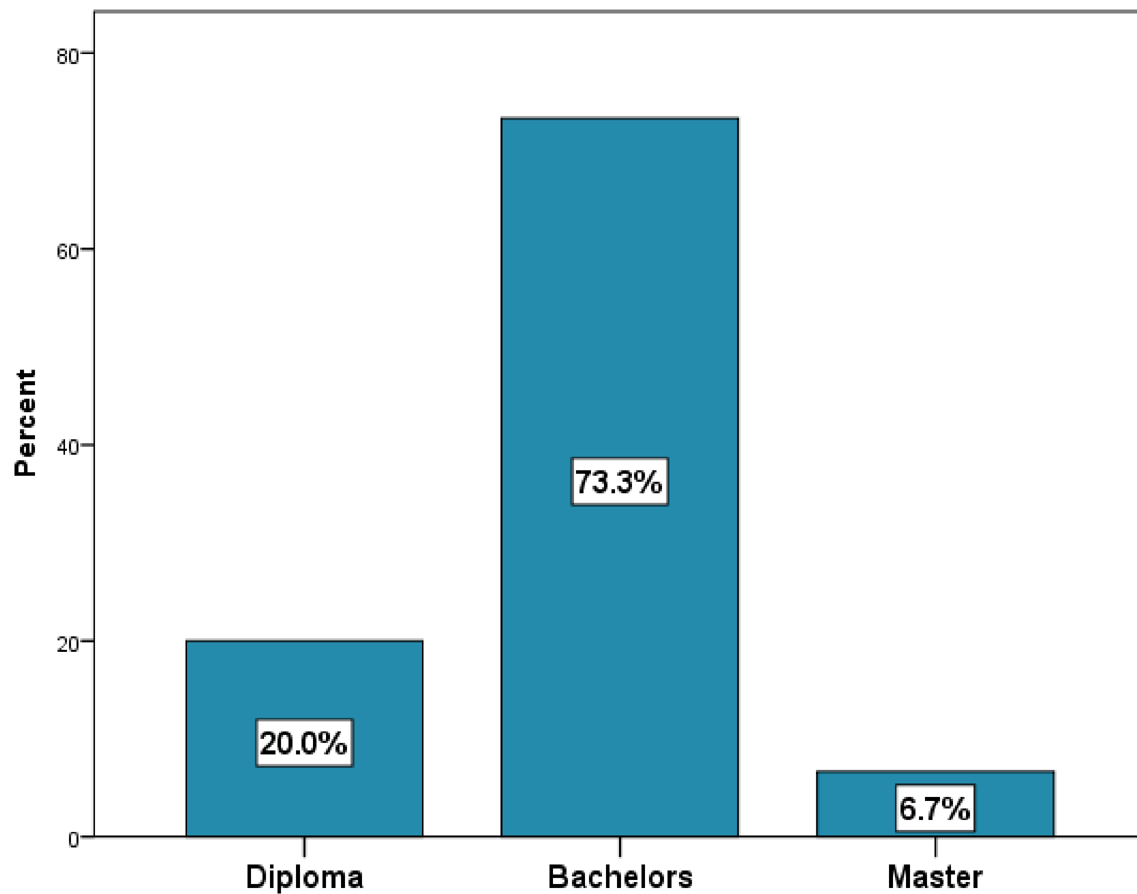

Figure (1): Distribution of nurse’s according to qualification degree

The above figure showed that,(73.3%) of nurse’s have bachelor, (6.7%) have master degree and (20.0%), have diploma.

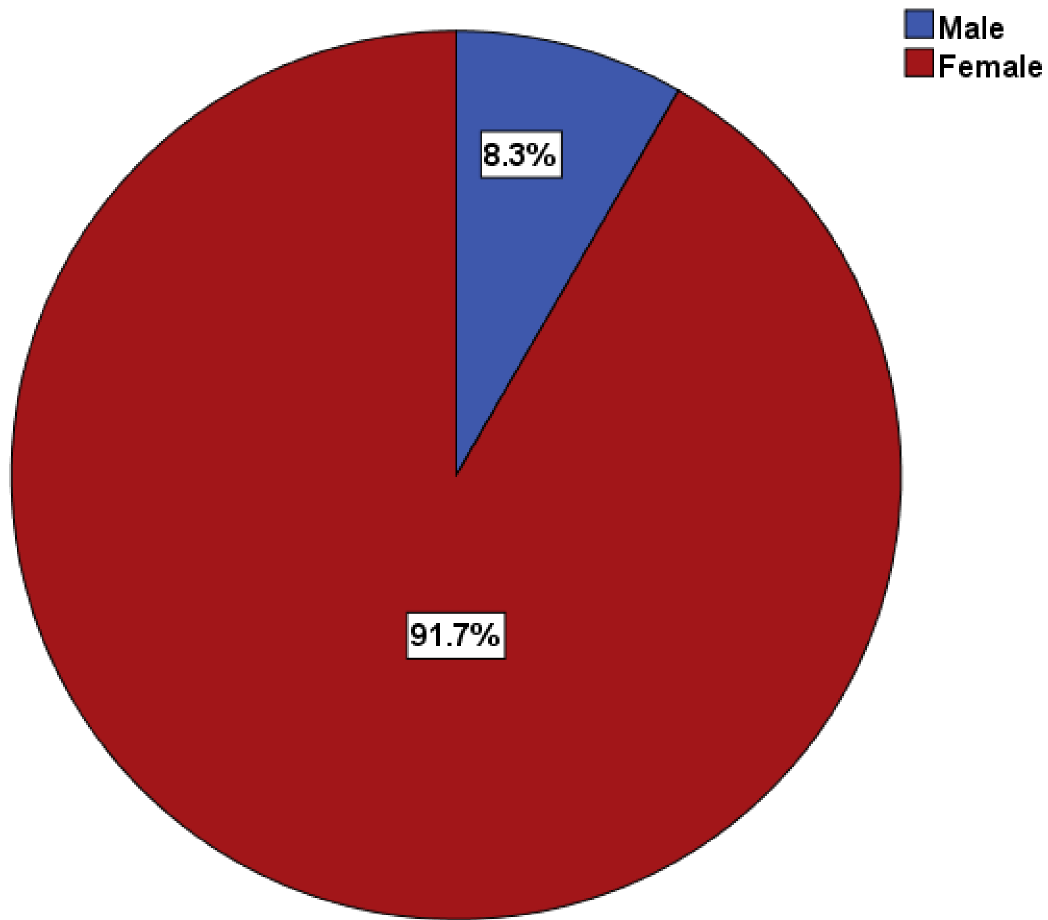

Figure (2): Distribution of nurse's according to sex

The above figure showed that (91.7%) of nurse's is female and (8.3%) is male.

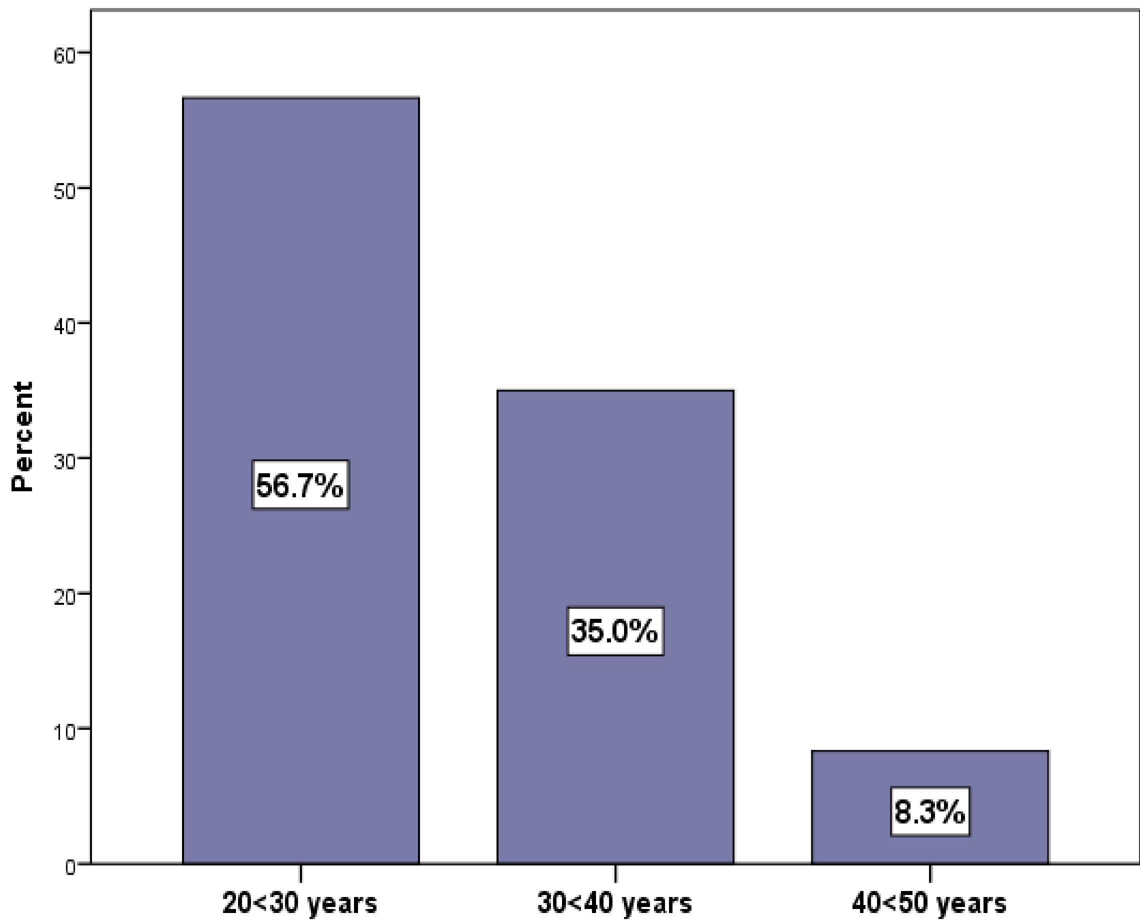

Figure No (3)   distribution of nurse's according to age group

The above figure showed that (56.7%) of nurse's at age 20<30 years old, (35.0%) at age 30<40 years old and (8.3%) of nurse's at age 40<50 years old.

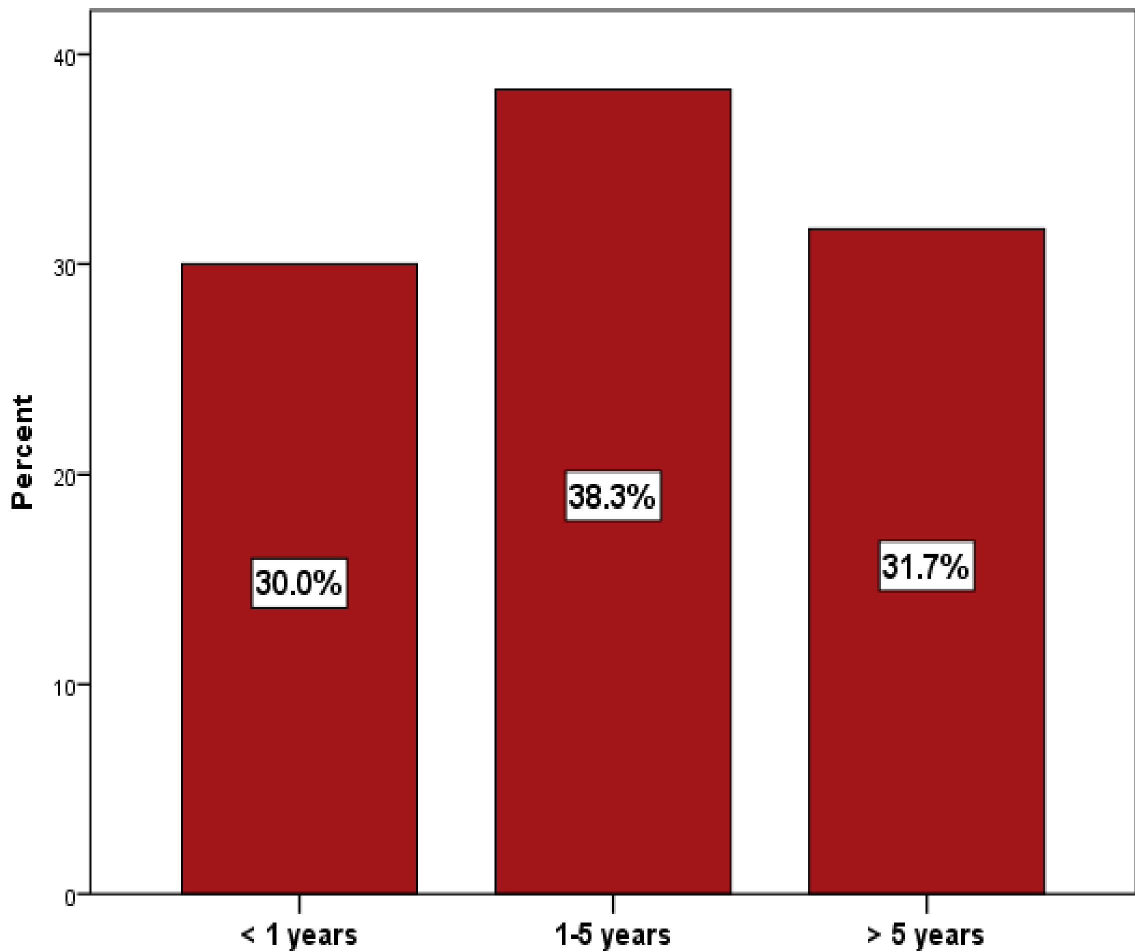

Figure No (4) distribution of nurse's according to years of experience.

The above figure showed that (30.0%) of nurse's have less than one years, (38.3%) have (1-5) years and (31.7%) of nurse's have more than 5 years.

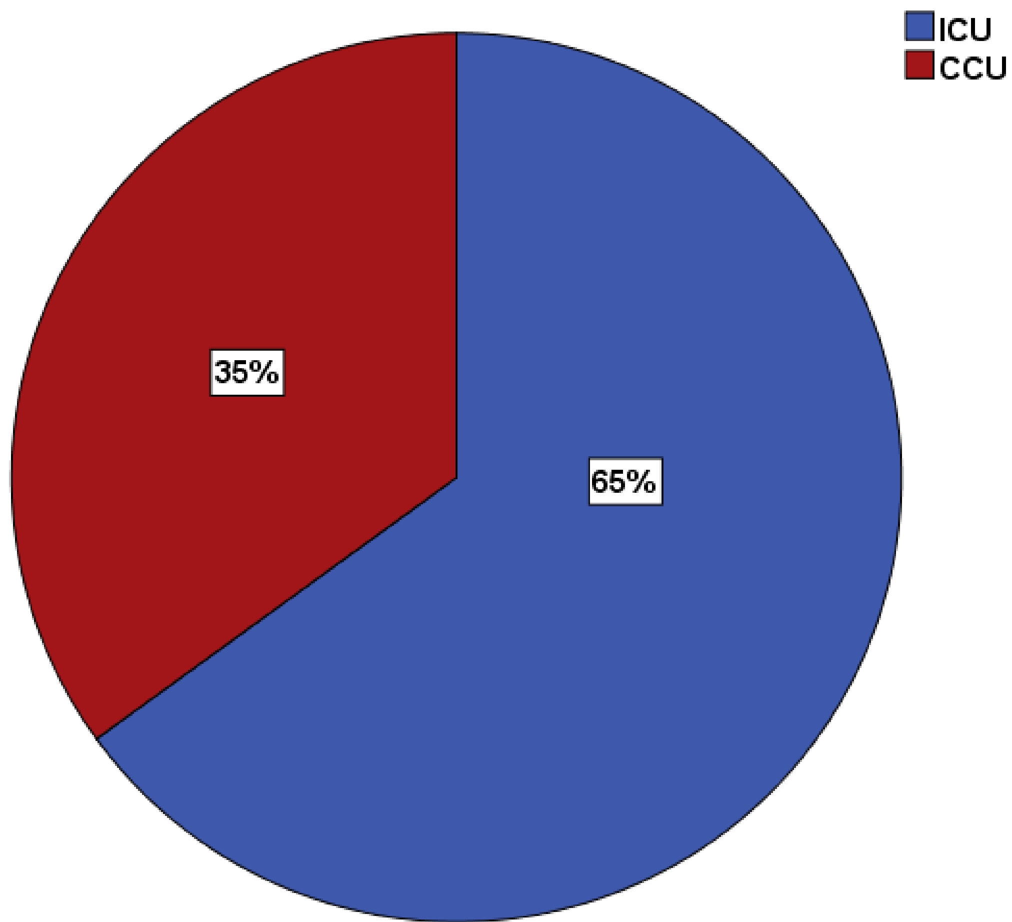

Figure NO (5) Distribution of nurse’s according to place of work.

The above figure showed that (65%) of nurse's working in ICU and (35%) working in CCU.

Table (1): Distribution of nurse's according to definition of CPR:

Level of knowledge	Frequency	Percent
Good knowledge	45	75%
Poor knowledge	15	25%
Total	**60**	**100%**

The above table showed that(75%) of nurse had Good knowledge about definition CPR and (25%) ware Poor knowledge.

Table (2): Distribution of nurse's according to complication of CPR:

Level of knowledge	Frequency	Percent
Good knowledge	50	83.3%
Poor knowledge	10	16.7%
Total	**60**	**100%**

The above table showed that(83.3%) of nurse had Good knowledge about complication of CPR and (16.7%) ware Poor knowledge.

Table (3): Distribution of nurse's according to assess high quality CPR:

Level of knowledge	Frequency	Percent
Good knowledge	35	58.3%
Poor knowledge	25	41.7%
Total	**60**	**100%**

The above table showed that(58.3%) of nurse had Good knowledge about assess quality CPR and (41.7%) ware Poor knowledge.

Table (4): Distribution of nurse's according to when can stop CPR:

Level of knowledge	Frequency	Percent
Good knowledge	42	70%
Poor knowledge	18	30%
Total	**60**	**100%**

The above table showed that(70.%) of nurse had Good knowledge about when can stop of CPR and (30%) ware Poor knowledge.

Table (5): Distribution of nurse's according to how to open the airway if patient suspect a spinal injury:

Level of knowledge	Frequency	Percent
Good knowledge	33	55%
Poor knowledge	27	45%
Total	**60**	**100%**

The above table showed that (55%) of nurse had Good knowledge about how to open the airway and (45%) ware Poor knowledge.

Table (6): Distribution of nurse's according to the optimum way to open a person's airway prior to giving them mouth to mouth ventilations:

Level of knowledge	Frequency	Percent
Good knowledge	52	86.7%
Poor knowledge	8	13.3%
Total	**60**	**100%**

The above table showed that(86.7%) of nurse had Good knowledge about the optimum way to open a person's airway prior to giving them mouth to mouth ventilations and (31.3%) ware Poor knowledge.

Table (7): Distribution of nurse's according to time of switch in High quality CPR :

Level of knowledge	Frequency	Percent
Good knowledge	35	58.3%
Poor knowledge	25	41.7%
Total	**60**	**100%**

The above table showed that (58.3%) of nurse had Good knowledge about time of switch in High quality CPR and (41.7%) ware Poor knowledge.

Table (8): Distribution nurse's according to the preferred way to check collapse person breathing:

Level of knowledge	Frequency	Percent
Good knowledge	54	90%
Poor knowledge	6	10%
Total	**60**	**100%**

The above table showed that (90%) of nurse had Good knowledge about Check collapse person breathing and (10%) ware Poor knowledge.

Table (9): Distribution of nurse's according to the chest does not appear to rise:

Level of knowledge	Frequency	Percent
Good knowledge	25	41.7%
Poor knowledge	35	58.3%
Total	**60**	**100%**

The above table showed that (41.7%) of nurse had Good knowledge about The chest does not appear to rise and (58.3%) ware Poor knowledge.

Table (10): Distribution of nurse's according to assess the pulse in collapse adult patient:

Level of knowledge	Frequency	Percent
Good knowledge	44	73.3%
Poor knowledge	16	26.7%
Total	**60**	**100%**

The above table showed that (73.3%) of nurse had Good knowledge about assess the pulse in collapse adult patient and (26.7%) ware Poor knowledge.

Table (11): Distribution of nurse's according to the ratio of compression to breaths:

Level of knowledge	Frequency	Percent
Good knowledge	42	70%
Poor knowledge	18	30%
Total	**60**	**100%**

The above table showed that (70%) of nurse had Good knowledge about The ratio of compression to breaths and (30%) ware Poor knowledge.

Table (12): Distribution of nurse's according to the correct hand placement to perform CPR:

Level of knowledge	Frequency	Percent
Good knowledge	15	25%
Poor knowledge	45	75%
Total	**60**	**100%**

The above table showed that (25%) of nurse had Good knowledge about The correct hand placement to perform CPR and (75%) ware Poor knowledge.

Table (13): Distribution of nurse's according to chest compression during CPR:

Level of knowledge	Frequency	Percent
Good knowledge	33	55%
Poor knowledge	27	45%
Total	**60**	**100%**

The above table showed that (55%) of nurse had Good knowledge about Chest compression during CPR and (45%) ware Poor knowledge.

Table (14): Distribution of nurse's according to the depth of chest compression during CPR:

Level of knowledge	Frequency	Percent
Good knowledge	39	65%
Poor knowledge	21	35%
Total	**60**	**100%**

The above table showed that (65%) of nurse had Good knowledge about The depth of chest compression during CPR and (35%) ware Poor knowledge.

Table (15): Distribution of nurse's according to properly operating an AED:

Level of knowledge	Frequency	Percent
Good knowledge	34	56.7%
Poor knowledge	26	43.3%
Total	**60**	**100%**

The above table showed that (56.7%) of nurse had Good knowledge about Properly operating an AED during CPR and (43.3%) ware Poor knowledge.

Table (16): Distribution of nurse's according to what to do after delivering a shock:

Level of knowledge	Frequency	Percent
Good knowledge	35	58.3%
Poor knowledge	25	41.7%
Total	**60**	**100%**

The above table showed that (58.3%) of nurse had Good knowledge about What to do after delivering a shock and (41.7%) ware Poor knowledge.

Table (17): Distribution of nurse's according to most common place of the AED pads in the adult:

Level of knowledge	Frequency	Percent
Good knowledge	30	50%
Poor knowledge	30	50%
Total	**60**	**100%**

The above table showed that (50%) of nurse had Good knowledge about Most common place of the AED pads in the adult and (50%) ware Poor knowledge.

Table (18): Distribution of nurse's according to common drugs use in CPR:

Level of knowledge	Frequency	Percent
Good knowledge	57	95%
Poor knowledge	3	5%
Total	**60**	**100%**

The above table showed that (90%) of nurse had Good knowledge about Most Common drugs use in CPR and (5%) ware Poor knowledge.

Table (19): The association between years of experience &and knowledge about You suspect a spinal injury in a victim who is unresponsive and not breathing:

Years of experience		Knowledge		Total
		Good	Poor	
< 1 years	Count	10	8	18
	%	55.6%	44.4%	100%
1-5 years	Count	10	13	23
	%	43.5%	56.5%	100%
> 5 years	Count	13	6	19
	%	68.4%	31.6%	100%
Total	Count	33	27	60
	%	55.0%	45.0%	100%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.619[a]	2	.270
Likelihood Ratio	2.655	2	.265
Linear-by-Linear Association	.645	1	.422
N of Valid Cases	60		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.10.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.105-	.126	-.801-	.427[c]
Ordinal by Ordinal	Spearman Correlation	-.106-	.128	-.811-	.421[c]
N of Valid Cases		60			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

*P. value significant if ≤ 0.5

Correlation is significant if the P- value less than 0.05, highly significant if P-value 0.00, not significant if the P-value more than 0.05.

P. value = 0.427

The relation between years of experience and knowledge of nurse about suspect a spinal injury in a victim who is unresponsive and not breathing was not significant.

Table (20): The association between years of experience &and knowledge about The optimum way to open a person's airway prior to giving them mouth to mouth ventilations:

Years of experience		**Knowledge**		**Total**
		Good	**Poor**	
< 1 years	Count %	15 83.3%	3 16.7%	18 100%
1-5 years	Count %	19 82.6%	4 17.4%	23 100%
> 5 years	Count %	18 94.7%	1 5.3%	19 100%
Total	Count %	52 86.7%	8 13.3%	60 100%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.572[a]	2	.456
Likelihood Ratio	1.812	2	.404
Linear-by-Linear Association	1.047	1	.306
N of Valid Cases	60		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is 2.40.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.133-	.113	-1.024-	.310[c]
Ordinal by Ordinal	Spearman Correlation	-.134-	.113	-1.029-	.308[c]
N of Valid Cases		60			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

P. value = 0.310

The relation between Years of experience and knowledge of nurse about the optimum way to open a person's airway prior to giving them mouth to mouth ventilations was not significant.

Table (21): The association between years of experience &and knowledge about You suspect a spinal injury in a victim who is unresponsive and not breathing:

Years of experience		Knowledge		Total
		Good	Poor	
< 1 years	Count	8	10	18
	%	44.4%	55.6%	100%
1-5 years	Count	14	9	23
	%	60.9%	39.1%	100%
> 5 years	Count	13	6	19
	%	68.4%	31.6%	100%
Total	Count	35	25	60
	%	58.3%	41.7%	100%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.285[a]	2	.319
Likelihood Ratio	2.285	2	.319
Linear-by-Linear Association	2.134	1	.144
N of Valid Cases	60		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.50.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.190-	.126	-1.475-	.146[c]
Ordinal by Ordinal	Spearman Correlation	-.190-	.126	-1.473-	.146[c]
N of Valid Cases		60			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

P. value = 0.146

The relation between Years of experience and knowledge of nurse about suspect a spinal injury in a victim who is unresponsive and not breathing was not significant.

Table (22): The association between years of experience &and knowledge about In high quality CPR, the person who performing chest compression and other person performing breathing, are switching every:

Years of experience		Knowledge		Total
		Good	Poor	
< 1 years	Count	16	2	18
	%	88.9%	11.1%	100%
1-5 years	Count	20	3	23
	%	87.0%	13.0%	100%
> 5 years	Count	18	1	19
	%	94.7%	5.3%	100%
Total	Count	54	6	60
	%	90.0%	10.0%	100%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.735[a]	2	.692
Likelihood Ratio	.805	2	.669
Linear-by-Linear Association	.357	1	.550
N of Valid Cases	60		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is 1.80.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.078-	.115	-.595-	.554[c]
Ordinal by Ordinal	Spearman Correlation	-.078-	.116	-.599-	.551[c]
N of Valid Cases		60			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

P. value = 0.554

The relation between Years of experience and knowledge of nurse about high quality CPR, the person who performing chest compression and other person performing breathing, are switching every was not significant.

Table (23): The association between years of experience &and knowledge about The preferred way to check collapse person breathing:

Years of experience		Knowledge		Total
		Good	Poor	
< 1 years	Count	7	11	18
	%	38.9%	61.1%	100%
1-5 years	Count	8	15	23
	%	34.8%	65.2%	100%
> 5 years	Count	10	9	19
	%	52.6%	47.4%	100%
Total	Count	25	35	60
	%	41.7%	58.3%	100%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.445[a]	2	.485
Likelihood Ratio	1.439	2	.487
Linear-by-Linear Association	.730	1	.393
N of Valid Cases	60		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.50.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.111-	.130	-.852-	.397[c]
Ordinal by Ordinal	Spearman Correlation	-.112-	.130	-.859-	.394[c]
N of Valid Cases		60			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

P. value = 0.397

The relation between Years of experience and knowledge of nurse about the preferred way to check collapse person breathing was not significant.

Table (24): The association between years of experience &and knowledge about When you try to give an unresponsive adult a rescue breath and the chest does not appear to rise:

Years of experience		Knowledge		Total
		Good	Poor	
< 1 years	Count	11	7	18
	%	61.1%	38.9%	100%
1-5 years	Count	16	7	23
	%	69.6%	30.4%	100%
> 5 years	Count	17	2	19
	%	89.5%	10.5%	100%
Total	Count	44	16	60
	%	73.3%	26.7%	100%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.073[a]	2	.130
Likelihood Ratio	4.479	2	.107
Linear-by-Linear Association	3.771	1	.052
N of Valid Cases	60		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 4.80.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.253-	.116	-1.990-	.051[c]
Ordinal by Ordinal	Spearman Correlation	-.253-	.116	-1.994-	.051[c]
N of Valid Cases		60			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

P. value = 0.051

The relation between Years of experience and knowledge of nurse about when you try to give an unresponsive adult a rescue breath and the chest does not appear to rise was significant.

Table (25): The association between years of experience &and knowledge about How to assess the pulse in collapse adult patient:

Years of experience		Knowledge		Total
		Good	Poor	
< 1 years	Count	12	6	18
	%	66.7%	33.3%	100%
1-5 years	Count	19	4	23
	%	82.6%	17.4%	100%
> 5 years	Count	11	8	19
	%	57.9%	42.1%	100%
Total	Count	42	18	60
	%	70.0%	30.0%	100%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.162[a]	2	.206
Likelihood Ratio	3.272	2	.195
Linear-by-Linear Association	.366	1	.545
N of Valid Cases	60		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.40.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.079	.138	.602	.550[c]
Ordinal by Ordinal	Spearman Correlation	.080	.139	.614	.542[c]
N of Valid Cases		60			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

*P. value significant if ≤ 0.05

P. value = 0.550

The relation between Years of experience and knowledge of nurse about how to assess the pulse in collapse adult patient was not significant.

Table (26): The association between years of experience &and knowledge about The ratio of compression to breaths when performing cardiopulmonary resuscitation(CPR):

Years of experience		Knowledge		Total
		Good	Poor	
< 1 years	Count	8	10	18
	%	44.4%	55.6%	100%
1-5 years	Count	4	19	23
	%	17.4%	82.6%	100%
> 5 years	Count	3	16	19
	%	15.8%	84.2%	100%
Total	Count	15	45	60
	%	25.0%	75.0%	100%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.199[a]	2	.074
Likelihood Ratio	4.922	2	.085
Linear-by-Linear Association	3.909	1	.048
N of Valid Cases	60		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 4.50.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.257	.128	2.029	.047[c]
Ordinal by Ordinal	Spearman Correlation	.256	.128	2.019	.048[c]
N of Valid Cases		60			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

P. value = 0.047

The relation between Years of experience and knowledge of nurse about the ratio of compression to breaths when performing cardiopulmonary resuscitation(CPR) was not significant.

Table (27): The association between years of experience &and knowledge about The correct hand placement to perform CPR:

Years of experience		Knowledge		Total
		Good	Poor	
< 1 years	Count	10	8	18
	%	55.6%	44.4%	100%
1-5 years	Count	12	11	23
	%	52.2%	47.8%	100%
> 5 years	Count	11	8	19
	%	57.9%	42.1%	100%
Total	Count	33	27	60
	%	55.0%	45.0%	100%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.141[a]	2	.932
Likelihood Ratio	.141	2	.932
Linear-by-Linear Association	.022	1	.883
N of Valid Cases	60		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.10.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.019-	.129	-.146-	.884[c]
Ordinal by Ordinal	Spearman Correlation	-.020-	.129	-.149-	.882[c]
N of Valid Cases		60			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

P. value = 0.884

The relation between Years of experience and knowledge of nurse about the correct hand placement to perform CPR was not significant.

Table (28): The association between years of experience &and knowledge about Chest compression during CPR:

Years of experience		Knowledge		Total
		Good	Poor	
< 1 years	Count %	12 66.7%	6 33.3%	18 100%
1-5 years	Count %	15 65.2%	8 34.8%	23 100%
> 5 years	Count %	12 63.2%	7 36.8%	19 100%
Total	Count %	39 65.0%	21 35.0%	60 100%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.051[a]	2	.975
Likelihood Ratio	.051	2	.975
Linear-by-Linear Association	.049	1	.824
N of Valid Cases	60		

a. 0 cells (0.0%) have expected count less than 5. The minimum
expected count is 6.30.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.029	.129	.220	.826[c]
Ordinal by Ordinal	Spearman Correlation	.029	.129	.221	.826[c]
N of Valid Cases		60			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

P. value = 0.826

The relation between Years of experience and knowledge of nurse about chest compression during CPR was not significant.

Table (29): The association between years of experience &and knowledge about The depth of chest compression during CPR:

Years of experience		Knowledge		Total
		Good	Poor	
< 1 years	Count	7	11	18
	%	38.9%	61.1%	100%
1-5 years	Count	14	9	23
	%	60.9%	39.1%	100%
> 5 years	Count	13	6	19
	%	68.4%	31.6%	100%
Total	Count	34	26	60
	%	56.7%	43.3%	100%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.551[a]	2	.169
Likelihood Ratio	3.563	2	.168
Linear-by-Linear Association	3.197	1	.074
N of Valid Cases	60		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.80.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.233-	.125	-1.823-	.074[c]
Ordinal by Ordinal	Spearman Correlation	-.232-	.125	-1.818-	.074[c]
N of Valid Cases		60			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

P. value = 0.074

The relation between Years of experience and knowledge of nurse about the depth of chest compression during CPR was significant.

Table (30): The association between years of experience &and knowledge about Properly operating an AED:

Years of experience		Knowledge		Total
		Good	Poor	
< 1 years	Count	11	7	18
	%	61.1%	38.9%	100%
1-5 years	Count	13	10	23
	%	56.5%	43.5%	100%
> 5 years	Count	11	8	19
	%	57.9%	42.1%	100%
Total	Count	35	25	60
	%	58.3%	41.7%	100%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.090[a]	2	.956
Likelihood Ratio	.090	2	.956
Linear-by-Linear Association	.037	1	.847
N of Valid Cases	60		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.50.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.025	.129	.191	.849[c]
Ordinal by Ordinal	Spearman Correlation	.025	.129	.190	.850[c]
N of Valid Cases		60			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

P. value = 0.849

The relation between Years of experience and knowledge of nurse about properly operating an AED was not significant.

Table (31): The association between years of experience &and knowledge about Most common place of the AED pads in the adult:

Years of experience		Knowledge		Total
		Good	Poor	
< 1 years	Count	8	10	18
	%	44.4%	55.6%	100%
1-5 years	Count	11	12	23
	%	47.8%	52.2%	100%
> 5 years	Count	11	8	19
	%	57.9%	42.1%	100%
Total	Count	30	30	60
	%	50.0%	50.0%	100%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.739[a]	2	.691
Likelihood Ratio	.742	2	.690
Linear-by-Linear Association	.665	1	.415
N of Valid Cases	60		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.00.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.106-	.128	-.813-	.420[c]
Ordinal by Ordinal	Spearman Correlation	-.106-	.128	-.815-	.419[c]
N of Valid Cases		60			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

P. value = 0.420

The relation between Years of experience and knowledge of nurse about most common place of the AED pads in the adult was not significant.

Table (32): The association between years of experience &and knowledge about Common drugs use in CPR:

Years of experience		Knowledge		Total
		Good	Poor	
< 1 years	Count	17	1	18
	%	94.4%	5.6%	100%
1-5 years	Count	21	2	23
	%	91.3%	8.7%	100%
> 5 years	Count	19	0	19
	%	100.0%	0.0%	100%
Total	Count	57	3	60
	%	95.0%	5.0%	100%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.673[a]	2	.433
Likelihood Ratio	2.507	2	.285
Linear-by-Linear Association	.617	1	.432
N of Valid Cases	60		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is .90.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.102-	.085	-.783-	.437[c]
Ordinal by Ordinal	Spearman Correlation	-.103-	.085	-.791-	.432[c]
N of Valid Cases		60			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

P. value = 0.437

The relation between Years of experience and knowledge of nurse about common drugs use in CPR was not significant.

Chapter five

<u>Discussion</u>

<u>Conclusion</u>

<u>Recommendations</u>

5.1. Discussion

Cardiopulmonary resuscitation (CPR) is an important medical procedure which is needed for individuals who face sudden cardiac arrest. It is a combination of rescue breathing and chest compressions which is delivered to the victims who are thought to be in cardiac arrest [(14).]

This study designed to assess knowledge of nurses about Cardiopulmonary resuscitation in Atbara hospital (ICU,CCU) unit, at period extended from June to September 2021.

The study found that majority (95%) of study group were knowledge about common drugs use in CPR, while (90%) the preferred way to check collapse person breathing, While more than two third (73.3%) of study group had same knowledge about assess the pulse in collapse adult patient. Because most of nurses in this hospital their qualification was bachelor and master degree, this qualification make them more knowledgeable , Because their created hours more than other nurses which their qualification diploma certificate.

Also the study reflected that more than two third (75%) of study group had poor knowledge about the correct hand placement to perform CPR, While more than half (58.3) of them had poor knowledge about what is the next action after give two breathing if the chest does not appear to rise, While half (50%) of study group also had poor knowledge about to most common place of the Automated external defibrillator (AED) pads in the adult. All results were reflected to: nurses staff did not attended any courses or workshops about Cardiopulmonary resuscitation.

Regarding to this study (70%) can perform both breathing and cardiac compression, this result disagree with the Turkish study By S ¸ Ozbilgin et al 2015 that conducted (28.7%) can perform both breathing and cardiac compression, and also disagree with the Slovenian study By R. Rajapakse et al in 2010 that conducted (38%) can perform both breathing and cardiac compression.

On other hand the study showed that most (86.7%) of study group were good knowledge on maneuvers of open air way, and more than two third (73.3%) of study group were aware about check for pulse, this result agree with the Bahraini study done by Hussain marzooq et al in 2009 the most of study group (89.2%) were good

knowledge on maneuvers of open air way and, more than two third (78.4%) of study group check for pulse.

Also the current study clarified that majority (90%) of nurses were knowledgeable about check for breathing , but less than third (25%) were good knowledge about correct compression hand placement, So this result disagree with mentioned above study which showed that more than half (59.5%) of nurses check for breathing , and most (86.5%) of study group were good knowledge of correct compression hand placement.

The statistical test revealed that no statistical relation between years of nurses experience and knowledge of nurses about Cardiopulmonary resuscitation . this result reflected to instability of nurses in ICU,CCU unit and the movement of nurse to other department during the years of experience.

5.2. Conclusion

Based on the finding present study, it was concluded that:-

- Majority (95%) of study group have Good knowledge regarding common drugs use in cardiopulmonary resuscitation, and (90%) of study group have Good knowledge regarding the preferred way to check collapse person breathing.
- More than two third (73.3%) of study group had good knowledge about assess the pulse in collapse adult patient.
- More than two third (75%) of study group had poor knowledge about the correct hand placement to perform CPR, While more than half (58.3) of them had poor knowledge about chest does not appear to rise.
- Half (50%) of study group also had poor knowledge about to most common place of the AED pads in the adult.

5.3. Recommendations

Based on the result and conclusion of the study the following is recommended:

- The hospital should establish regular training program and workshops about cardiopulmonary resuscitation with collaboration with ministry of health.
- Nurses should keep fixed program to discuss problems that faced him during CPR and contribute by solution
- Evidence based nursing and continuing updating protocol regarding cardiopulmonary resuscitation is important to improve nursing knowledge and practices.
- Health education to nurses in hospitals and continuous medical education.
- Encourage nurses to self learning about cardiopulmonary resuscitation

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Appendices

Questionnaire

بسم الله الرحمن الرحيم

Elshaikh Abdallah Elbadry University

Faculty of Health Sciences

Department of Nursing

Questionnaire about assessment of nurses knowledge regarding Cardio-Pulmonary Resuscitation

Part one: assessment of nurses knowledge regarding Socio-demographic data:

1) Age:

a) 20<30( ) b) 30<40 ( )c) 40<50 ( ) d) >50 ( )

2) Sex:

a)Male ( ) b) Female ( )

3) Qualification degree:

a) Diploma( ) b)Bachelors ( ) c) Master ( ) d) PhD ( )

4) Years of experience:

a) Less than one years ( ) b) 1-5 years ( ) c) More than 5 years ( )

Part two: assessment of nurses knowledge regarding general information of CPR:

5) CPR is…

a) It is an emergency lifesaving procedure performed when a person's heart stops beating.
b) It is an administrative procedure used to record medical procedures on a person.
c) Used to assess a patient's medical condition.
d) A way of bringing person's blood pressure down.

6) Complication of CPR:

a) Fracture of ribs or the sternum

b) Injury of lung and heart

c) Tracheal rupture following emergency intubation during CPR

d) All above are correct

7) How to assess high quality CPR :

a) Pulse during chest compression

b) Chest expansion during breathing

c) No pulse during chest compression

d) A and B are correct

8) When can you stop CPR:

a) The patient sign of life

b) Another responder arrives and is ready to take over CPR

c) You are too exhausted to continue

d) All above are correct

Part three: assessment of nurses knowledge regarding CPR technique:

❖ **Airway:**

9) You suspect a spinal injury in a victim who is unresponsive and not breathing. How would you open the airway to give breaths?

a) Jaw-thrust technique

b) Head tilt-chin lift

c) E-C clamp technique

d) Thumb & index lift

10) The optimum way to open a person's airway prior to giving them mouth to mouth ventilations?

a) Tilt their head back and lift the chin up.

b) Tilt their head forward and push down on the chest.

c) Roll them to their right side then tilt their head back.

d) Place them facing downwards on their stomach then lift their head back..

11) In high quality CPR, the person who performing chest compression and other person performing breathing, are switching every:

a) 2 minute b) 5 minute c) 7 minute d) 10 minute

❖ Breathing:

12) The preferred way to check collapse person breathing is

a) Look for chest expansion
b) Feel for breathing
c) Listen for breathing
d) All above are correct

13) When you try to give an unresponsive adult a rescue breath and the chest does not appear to rise what would you do next?

a) Perform abdominal thrust
b) Begin CPR
c) Call for help
d) Repeat the head tilt/chin lift maneuver and attempt the breath again

❖ Circulation:

14) How to assess the pulse in collapse adult patient?

a) Femoral pulse
b) Radial pulse
c) Carotid pulse
d) Axillary pulse

15) The ratio of compression to breaths when performing cardiopulmonary resuscitation(CPR)?

a) 15 compression:3breath
b) 20 compression: 2 breath
c) 30 compression: 2 breath
d) 30 breath: 2 compression

16) The correct hand placement to perform CPR includes:

a) Lower third of the sternum
b) Upper half of the sternum
c) Upper third of the sternum
d) Lower half of the sternum

17) Chest compression during CPR should be:

a) Hard and fast and not interrupted as little as possible
b) Gentle and slow and interrupted as little as possible

c) Hard and fast with frequent interruption for pulse checks

d) Gentle and slow with frequent interruption forpulse checks

18) The depth of chest compression during CPR:

a) 1 inch

b) 1.5- 2 inches

c) At least 3 inches

d) None of the above are correct

- **Part four:** assessment of nurses knowledge about defibrillation and drug during CPR:

❖ **Defibrillation:**

19) Properly operating an AED include the following

a) Power on the AED, attach electrode pads, shock the person, and analysis the rhythm
b) Power on the AED, attach electrode pads, analysis the rhythm, and shock the person
c) Power on the AED, analysis the rhythm, attach electrode pads, and shock the person

d) Power on the AED ,shock the person, attach electrode pads, and analysis the rhythm

20) After delivering a shock, you should:

a) Open airway

b) Turn off the AED

c) Continue chest compression

d) Continue Shock without interrupted

21) Most common place of the AED pads in the adult:

a) One pad in the Right under the shoulder, and another pad in the left apex of the heart
b) One pad in the Right under the shoulder, and another pad in the sternum
c) One pad under the nipple, and another pad in the left apex of the heart
d) All the above arecorrects

22) Common drugs use in CPR:

a) Adrenaline

b) Magnesium sulphate

c) Amidarone

d) Lidocaine

Ethical consideration

جمهورية السودان
جامعة الشيخ عبدالله البدري
كلية العلوم الصحية
مكتب العميد

THE REPUBLIC OF SUDAN
ELSHAIKH ABDALLAH ELBADRY UNIVERSITY
Faculty of Health Sciences
Dean's Office

التاريخ: 2021/8/3م

السيد / .... مستشفى عطبرة التعليمي

المحترم

السلام عليكم ورحمة الله وبركاته

الموضوع/ بحث علمي لنيل درجة البكالوريوس في علوم التمريض

في البدء نشكر سيادتكم علي التعاون المشترك بيننا ونسأل الله أن يوفقكم ويوفقنا في خدمة طلاب العلم .

وبالإشارة للموضوع أعلاه ، نرجو من سيادتكم التكرم بالسماح للطلاب المرفقين بأداء بحوث التخرج في مستشفاكم العامر وجزاكم الله خيراً.

...وفقنا الله وإياكم ...

د. ايمان زين العابدين هاشم يسن
عميد الكلية

مرفق لكم:
* اسم البحث
* أسماء الطلاب