

**Nurses' Performance regarding Basic Cardiopulmonary Resuscitation**  
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### Abstract

**Introduction** The new CPR guidelines of AHA emphasize on compressions – according to the guidelines, a rescuer needs to press not only hard but fast. This is irrespective, whether the rescuer is an expert or a regular by stander. CPR in a simplified format lays focus on providing chest compressions help in maintaining blood flow and also oxygen in the same. As a result, blood flow is boosted and directed properly to the brain and heart of the concerning patient **Aim:** Assess Nurses' Performance regarding Basic Cardiopulmonary Resuscitation, **Subject & Methods:** A descriptive study was conducted at the Police Authority Hospital El-Agouza. **Results:** that less than half of nurses of total nurses under stander study very good by used lecture in traditional teaching method and half of nurses under study excellent by non traditional method used film to explain knowledge and practice of C.P.R. **Conclusion:** The majority of nurses performance were have average knowledge and practices regarding to basic cardiopulmonary resuscitation. **Recommendations:** in-service educational program for nurses regarding CPR to to improve their level of performance regarding basic cardiopulmonary resuscitation

**Keywords:** Nurses' Performance, Basic Cardiopulmonary Resuscitation.

### Introduction

Cardio pulmonary resuscitation (CPR) is a series of actions that may significantly increases that chance of survival following cardiac arrest. In most cardiac arrests, the critical elements of CPR are chest compressions and early defibrillation. Each situation is different depending in the rescuer, the victim and circumstances, but the key to success is early intervention.

CPR is easy as C–A–B the American Heart Association just announced the 2010 CPR guidelines. Compressions push hand and fast in the center of the Victims chest airway tilt the victim's head back and lift the chin to open the airway breathing give mouth-to-mouth rescue breathing.

CPR in a simplified format lays focus on providing chest compressions help in maintaining blood flow and also oxygen in the same. As a result, blood flow is boosted and directed properly to the brain and of the concerning patient

#### **The new CPR guidelines from the American Heart Association:**

First call 911; if not, others to call. Make the victim respond. If he/she does not respond, roll him/her on his/her back. Now in

the 3<sup>rd</sup> step, start giving chest compressions by placing your hand's heel part on the center of the chest of the victim, with the other hand placed on top of it, with interlaced fingers. Now press down and compress the chest approximately 2 inches in case of children and adults, but for infants, it should be 1.5 inches. Open airway by tilting the victim's head and lifting chin. This can be done, only if you have proper knowledge and training in CPR. Pinch the victim's nose and breath normally into his/her mouth by covering his/her mouth first. This helps in creating an airtight seal. Give rescue breaths for 2 seconds and determine whether the victim's chest rises or not. Carry on giving chest compression and breaths in the ratio 30:2 for 100 compressions per minute, till the time any medical assistance arrives (**AHA CPR guidelines, 2014**).

The new CPR guidelines of AHA encourage more and more by standers to perform CPR and handle emergencies. Giving mouth to mouth resuscitation is not easy for an untrained by stander. However, giving chest compressions is not at all difficult. In fact, if some one performs perfect chest compressions, he/she can save a life in the process. Cricoid pressure used during ventilation is no more part of the changed guidelines. This particular step was present earlier, used on a deeply

unconscious patient (**American Heart Association, 2011**). It was changes according to studies that showed risks of the method – cricoid pressure might obstruct ventilation. Furthermore, it is also not easy for professional rescuers to use cricoid pressure. Therefore, the maneuver was made to discontinue as per new CPR guidelines of American Heart Association (**American heart association. Original, 2011**).

Cardiac arrest, near drowning, electrocaution, choking are emergencies that need on instant response with prior knowledge and training in first aid and CPR, you can ensure the safety, as well as, as life of a person going through such medical emergencies. Information or lack of information might make the situation worse and cause a life, therefore, it should become a mandatory obligation for everyone to learn the basics of CPR, first aid and also keep each other updated about the changes made in their guidelines by major organizations (**Arrich J, et al., 2012**). At the end of the day, we need to keep in mind the facts – 80% medical emergencies occur in places other than hospitals and medical facilities and people handling these crises are regular people by standers (**Bebrow BJ et al., 2010**).

### How does CPR work

All the cells in your body require oxygen to survive (**Dlloyd-Jones RJet et al., 2010**). They also require a good supply of nutrients and the rapid removal of waste products. Oxygen and nutrients are carried around the body in your blood which is pumped by your heart. In your lungs, oxygen enters your blood stream and carbon dioxide (a waste product) is removed in a process know as gas exchange (**Elizabeth Sins et al., 2011**).

A cardiac arrest is when your heart stops beating this is not the same as a "heart attack", although a heart attack may lead to a cardiac arrest. There are numerous causes of cardiac arrests, including: A disturbance in the heart rhythm, drugs/poisoning, heart disease/ a heart attack, traumatic injury/ blood loss, Anaphylaxis. If a cardiac arrest occurs, blood will stop circulating around the body. Breathing will also cease as well though it may not stop

completely for several minutes (**Elizabeth Sinz, 2011**).

Without a supply of oxygen, the cells in the body start to die brain cells are incredibly sensitive, after about 4-5 minutes of no oxygen brain cells will begin dying leading to brain damage and death. The purpose of CPR is to keep oxygenated blood flowing around the body to keep the vital organs alive. CPR itself will not restart someone's heart, it just keeps them alive until a defibrillator arrives. A defibrillator is advice which delivers an electrical shock to the heart to restart it (**Field JM et al., 2010**).

### The new CPR guidelines from the AHA

First call 911. If not, other call. Make the victim respond. If he/she does not respond, roll him/her in his/her back. Start giving chest compressions by placing your hand's heel part on the center of the chest of the victim, with the other hand placed on top of it, with interlaced fingers). Press down and compress the chest approximately inches in case of children and adults, but for infants, it should be 0.5 inches. Open airway by tilting the victim's head and lifting chin. This can done, only if you have proper knowledge and training in CRP (**Kardon-edgren S, et al., 2010**).

Pinch the victim's nose and breath normally into his/her mouth by covering his/her mouth first. This helps in creating an airtight seal. Give rescue breaths for 2 seconds and determine whether the victim's chest rises or not. Carry on giving chest compressions and breaths in the ratio. 30:2 for 100 compressions per minute till the time any medical assistance arrives. The new CPR guideline of AHA encourage more and more by standers to perform CPR and handle emergencies. Giving mouth to mouth resuscitation is not easy for an untrained by stander (**Meaney PA, et al., 2013**). However, giving chest compressions is not at all difficult. In fact, if someone perfect chest compressions, he/she can save a life in the process (**Kitamura T, et al., 2011**).

The new first step is doing chest compressions instead of first establishing the airway and then doing mouth to mouth. The new guidelines apply to adults, children, and infants but exclude newborns. The old way was

A-B-c for airway, breathing and compressions. The new way is C-A-B for compressions, airway, and breathing. By starting with chest compressions, that's easy to remember, and many victims that alone will be life saving (Komasawa N, et al., 2011).

#### ***Before starting CPR check:***

Is the person conscious or unconscious? If the person appears unconscious, tap or shake his or her shoulder and ask loudly "are you ok"? If the person doesn't respond and two people are available, one should call (911) or the local emergency number and one should begin CPR. If you are alone and have immediate access to a telephone, call (911) before beginning CPR-unless you think the person has become unresponsive because of suffocation (such as from drowning). In this special case, begin CPR for one minute and then call (911) or the local emergency number. If an AED is immediately available, deliver one shock if instructed by the device then begin CPR (Sayre MR, et al., 2010).

#### **Remember to spell C-A-B.**

The American Heart Association was the acronym of CAB-circulation, airway, breathing- to help people remember the order to perform the steps of CPR. Circulation = restore blood circulation with chest compressions. Put the person on his or her back on a firm surface. Knee / next to the person's neck and shoulders. Place the heel of one hand over the center of the person's chest, between the nipples. Place your other hand on top of the first hand. Keep your elbows straight and position your shoulders directly above your hands (Robinjulie, et al., 2011).

Use your upper body weight (not just your arms) as your push straight down on (compress) the chest at least 2 inches (approximately 5 centimeters) push hand at a rate of about 100 compressions a minute. If you haven't been trained in CPR, continue chest compressions until there are signs of movement or until emergency medical personnel take over. If you have been trained in CPR, go on to checking the airway and rescue breathing (Kocharek PM., 2010).

**Airway:** Clear the airway and training CPR you have performed 30 chest compressions. Open the person's airway using the head tilt chin-lift maneuver. Put your palm on the person's forehead and gently tilt the head back. Then with the other hand, gently lift the chin forward to open the airway. Check for normal breathing. Taking no more than five or 10 seconds. Look for chest motion, listen for normal breath sounds. And feel for the person's breath on your cheek and ear. Gasping is not considered to be normal breathing. If the person isn't breathing normally and you are trained in CPR, begin mouth-to-mouth breathing. If you believe the person is unconscious from a heart attack and you haven't been trained in emergency procedures skip mouth to mouth continue chest compressions (Sevien EL, et al., 2010).

#### **Breathing: Breath for the person.**

Rescue breathing can be mouth-to-mouth breathing or mouth to nose breathing if the mouth is seriously injured or can't be opened. With the airway open (using the head, tilt, chin lift maneuver). pinch the nostrils shut for mouth-to-mouth breathing and cover the person's mouth with yours, making a seal. Prepare to give two rescue breaths. Give the first rescue breath-lasting one second. And watch to see if the chest rises. (Meaney PA, et al., 2013) If it does rise, give the second breath. If chest doesn't rise, repeat the head-tilt, chin lift maneuver and then give the second breath. Thirty chest compressions followed by two rescue breaths is considered one cycle. Resume chest compressions to restore circulation (Nadkarni VM, et al., 2012).

If the person has not begun moving after five cycles (about two minutes) and an automatic external defibrillator (AED) is available/apply it and follow the prompts. Administer one shock. Then resume CPR-starting with chest compressions-for two more minutes before administering a second shock. If you're not trained to use an AED (123) or other emergency medical operator may be able to guide you in its use. Use pediatric pads. If available, for children ages 1 through 8. Do not use an AED for babies younger than age 1. If an AED isn't available go to step 5 below. Continue CPR until there are signs of

movement or emergency medical personnel take over (**Kahane KA, et al., 2011**).

Cardiopulmonary resuscitation (CPR) consists of the use of chest compressions and artificial ventilation to maintain circulatory flow and oxygenation during cardiac arrest. Although survival rates and neurologic outcomes are poor for patients with cardiac arrest. Early appropriate resuscitation involving early defibrillation and appropriate implementation of post-cardiac arrest care lead to. Improved survival and neurologic outcomes (**Hazinski MF and Field JM 2010**).

CPR should be performed immediately on any person who has become unconscious and is found to be pulse less. Assessment of cardiac electrical activity via rapid "rhythm strip" recording can provide amore detailed analysis of the type of cardiac arrest, as well as indicate additional treatment options. Loss of effective cardiac activity is generally due to the spontaneous initiation of a nonperfusing arrhythmia, sometimes referred to as a malignant arrhythmia. The most common non perfusing arrhythmias include the following: ventricular fibrillation (VF), pulse less ventricular tachycardia (VT), pulse less electrical activity (PEA), a systole and pulse less brachycardia (**Kardon-edgren S, et al., 2010**).

CPR should be started before the rhythm is identified and should be continued while the defibrillator is being applied and charged. Additionally CPR should be resumed immediately after a defibrillatory shock until a pulsatile state is established.

The new guidelines may inspire more people to perform CPR, mouth to mouth is hand if you're not trained, any body can do chest compressions, whether they have had a class or not, good chest compressions really help save lives. In many cases, there is a reserve of oxygen left in the Patients blood and lungs, from the last breath and we can take advantage of that oxygen reserve and just do chest compressions (**AHA, 2006**).

### Equipment:

CPR is its most basic from can be performed anywhere without the need for

specialized equipment. Universal precautions (ie, gloves, mask, gown) should be taken. However CPR is delivery have been reported. Some hospitals and EMS systems employ devices to provide mechanical chest compressions. A cardiac defibrillator provides an electrical shock to the heart via 2 electrodes placed on the patient's torso and many restore the heart into a normal perfusing rhythm.

### Technique:

In its full, standard from CRR comprises the following 3 steps Performed in order: chest compressions, airway and breathing.

Starting CPR with so compressions rather than 2 ventilations leads to improved outcomes. It is clean that blood flow depends on chest compressions. There fore, providers must minimize delays in and interruptions of chest compressions through the entire resuscitation. Positioning the head, achieving a seal for mouth-to-mouth rescue breaths, or getting a bag-mask device for rescue breaths takes time. Beginning CPR with 30 compressions rather than 2 ventilations leads to a shorter delay to the first compression (**Hostler D, et al., 2011**).

Once one provider begins chest compressions, a second trained health care provider should deliver rescue breaths to provide oxygenation and ventilation as follows. Deliver each rescue breath over 1 second. Give a sufficient tidal volume to produce visible chest rise. Successful resuscitation attempts after require health care providers to simultaneously. Perform a variety of interventions. Although a CPR trained by stander working a lone can resuscitate a patient within the first moments after collapse most attempts require the concerted efforts of multiple health care providers effective team work divides the tasks while multiplying the chances a successful outcome. Successful teams not only have medical expertise and mastery of resuscitation skills, but they also demonstrate effective communication and team dynamics (**Elizabeth Sinz KN, 2010**).

### Aim of the Study

The current study aimed to Assess Nurses' Performance regarding Basic Cardiopulmonary Resuscitation

**Research question:**

1. What are the performance of nurses regarding Basic Cardiopulmonary Resuscitation?.

**Subjects and Methods****Research design:**

A descriptive study was used in the conduction of this study.

This study was conducted at Police Authority Hospital El-Agouza,

**Subjects:**

The subjects included all available nurses about 150 nurses working in critical care units (CCU – ICU – ER) at El-Agouza Hospital.

**Inclusion criteria:**

The nurses with all educational level (diploma – diploma specialty, bachelor degree) and both sex (male nurse – female nurse) and all shift (morning – after noon, night).

**Exclusion criteria** include nurse who receive any privacy courses or training in cardiopulmonary resuscitation (CPR).

**Tools used for data collection**

1. Self administer questionnaire sheet which include two parts;

**A- Part one:**

- Nurses Socio- demographic data; age, gender, qualification, years of experience in work at critical care units.

**B- Part two include:**

- Nurses knowledge assessment questionnaire; to assess nurses level of knowledge regarding basic CPR.
2. Standardized observational check list for basic CPR skills adopted from A.H.A. filled by researcher (*A.H.A., 2011*).

**Scoring System**

According to the nurses' answers, each correct answer had scored 1 degree and both wrong answer and do not know had 0 degree. Also, their practices were assessed and scored 1 degree if done correctly and zero if not done or

done incorrectly. Then the total scoring was calculated as level of knowledge and practice satisfactory (>70%) and unsatisfactory level of knowledge and practice (< 70%).

**Tools validity and reliability**

Tools validity was checked through distribution of the tools to seven experts in the field of the study of Medical surgical, content validity was assessed to determine whether the tool covers the appropriate and necessary content, as well as its relevance to the aim of the study, clarity, and its simplicity. The suggested modifications were done (rephrasing of some statements, omission and addition of certain items). Then the final form was stated.

**II-Operational design:**

The operational design of the study entails three main phases: preparatory phase, exploratory phase (pilot study) and field of the work.

**1-Preparatory phase:**

A review of past and current, local and international related literature using journal, magazines, scientific periodicals and books was done to develop the study tools and to get acquainted with the various aspects of the research problem.

**2-Pilot Study (exploratory phase):**

A pilot study conducted on 10% of the sample to test the applicability of the tools obtained results will be used as a guide to reconstruct the changes needed in the data collection tools.

**3-Field work**

Data collection was carried out in the period from the beginning of January 2012 to the end of June 2012. The researcher was available at the study setting three days weekly (Sunday, Monday and Tuesday).

The researcher started by explaining the nature, aim and expected outcomes of the study to the study subject individually using the previously mentioned tools.

**Ethical and legal issues**

Parental agreement was a prerequisite to involve the nurses in the study sample at the

first session. All ethical issues of research were maintained. The purpose, specific objectives, anticipated benefits and methods of the study were carefully explained to each eligible subject. When the subjects agreed to participate in the study, they were assured that they could withdraw at any time and they would not be identified in the report of the study. Also, the researcher informed the studied subject that, the research would be harmless, confidentiality in gathering and treating subject's information was secured.

### III-Administrative design

Approval was obtained from the dean of Faculty of Nursing (Ain Shams University) and the directors of the previously mentioned settings.

### IV-Statistical design

The data collected were revised, coded, tabulated and statistically analyzed using statistical package for the social science (SPSS) version 20. numbers and percentages distribution were done. The person correlation coefficient test, one way analysis of variance (ANOVA) test, mean and stander deviation were used to estimate the statistical significant difference between variables of the study. Probability of error (p-value) <0.05 was considered significant.

## Results

Table (1) show that less than three quarters 70% of nurses have nursing diploma, while one quarter 22% of them were holders

technical nursing, and the remaining 8% of sample were having B.Sc.N. degree.

Table (2) shows that the mean age of high years of experience between 5 to 9 ranged about (52.7%) years, while the 22.7%, of them ranged less than years, of them was 24.7% of them 10 or more years of experience.

Table (3) shows that 50% of nurses in the studied sample take lecture as method to distribution or explain the C.P.R knowledge and practice and 50% of nurses in the studied sample take film to explain the CPR knowledge and practice.

Table (4) show that 60% of nurses have very good satisfaction, 35.3% of another nurses have excellent under stander and except of training to sense of satisfaction and only 4.7% of nurses have good satisfaction.

Table (5) show that 90.7% of nurses have showed the CPR courses was enough and nicely time to under stander while 9.3% of nurses have need some time to caned under stander courses by suitable way.

Table (6) shows that 96% of nurses have clearness of the method of CPR courses and only 4% of nurses have showed to some extent or more explained the courses

Table (7) shows that is statistically significant showed, decreased knowledge of general information about CPR but average knowledge of general information.

Table (8) show average practice level of nurses regarding CPR

**Table (1):** Percentage distribution of nurses according educational level (N=150).

	Frequency	Percentage
<b>BSc</b>	12	8.0%
<b>Diploma</b>	105	70.0%
<b>Technical</b>	33	22.0%
Total	150	100.0

**Table (2):** Number of years of experience and percent distribution of nurses number.

	Frequency	Percentage
<b>Less than 5</b>	34	22.7%
<b>5 to 9</b>	79	52.7%
<b>10 or more</b>	37	24.7%
Total	150	100.0

**Table (3):** percent distribution of CPR training method nurses in under study (N=150).

	Frequency	Percentage
Lecture	75	50.0%
Film	75	50.0%
Total	150	100

**Table (4):** Percent distribution of nurse's satisfaction about under stander of CPR training.

	Frequency	Percentage
Good	7	4.7%
Very Good	90	60.0%
Excellent	53	35.3%
Total	150	

**Table (5):** Percent distribution of sufficient time of training course.

	Frequency	Percentage
To some extent	14	9.3%
Yes	136	90.7%
Total	150	100

**Table (6):** Percent distribution of CPR clearness of method to nurses.

	Frequency	Percentage
To some extent	6	4.0%
Yes	144	96.0%
Total	150	

**Table (7):** Percent distribution of general assessment knowledge of nurses (N=150).

	Mean	Std. Deviation
General Assessment	7.1	1.44

**Table (8):** Practice distribution level of nurses after taken courses (N=150).

	Mean	Std. Deviation
Practice Level	7.9	0.95

## Discussion

Cardiac arrest, near drowning, electrocaution, choking are emergencies that need on instant response with prior knowledge and training in first aid and CPR, you can ensure the safety, as well as, as life of a person going through such medical emergencies. Information or lack of information might make the situation worse and cause a life, therefore, it should become a mandatory obligation for everyone to learn the basics of CPR (Smekal D, et al., 2011).

**The current study aimed to;** Assess Nurses' Performance regarding Basic Cardiopulmonary Resuscitation

The current study revealed that less than three quarters of nurses have nursing diploma, while one quarter of them were holders technical nursing, and the remaining of sample were having B.Sc.

Nursing degree. This study is highly supported by a similar study of Elazazay, Abdelazez and Elsaie, 2012 who, study Effect of Cardiopulmonary Resuscitation training program on nurses knowledge and practice, mentioned that the majority of the studied sample two third of them have diploma, while most of them working in inpatient departments, the investigator believes that this may due to the majority of diploma nurses school graduated student worked related to their institutes, while the university student worked according to the distribution of MOH distribution.

This finding shows that more than half of the studied sample mean age of high years of experience between 5 to 9 ranged years, while the less than one quarter of them ranged less than years, also less than one quarter of them, ranged 10 or more years of experience. This study was not in accordance with the study of Hussain and Lynham, 2009 Who study Cardio-pulmonary

resuscitation knowledge among nurses who work in Bahrain, mentioned that the majority had general diploma in nursing with average years of experience of 12 years; this may be due to the different of the study setting

This study illustrated that nearly two quarters of nurses did not attend any CPR training courses, while nearly one quarter of sample obtained one training course, while one fifth of them obtained two courses, or three training course, and the rest of them obtain 4 or 5 training courses in CPR. This study is supported by the study of **Damjan, et al., 2011**, who study the Impact of additional module training on the level of basic life support knowledge of first year student at the university of Maribor, mentioned that one third of the studied sample has previous training courses regarding CPR.

According to the satisfaction level of the studied sample, it was clear that nearly two thirds of nurses have satisfaction, while one third of nurses have excellent understanding and except of training to sense of satisfaction. This study was supported by the study of **-Madden 2006**, who study undergraduate nursing student's acquisition and retention of CPR knowledge and Skills, mentioned that studied sample have satisfaction level of knowledge regarding CPR but they not master their skills, the investigator believes that this may due to that the current study subject were graduated but the other study subjects were student.

As demonstrated in the current finding regarding general assessment knowledge of nurses, it was found that there was decreased knowledge of general information about CPR but there was average knowledge of general information, this study was similar to the study of **American Heart Association, 2012**, who mentioned that most of the studied subjects have average knowledge regarding CPR.

As regards Practice level of nurses were average reported Mean  $\pm$  Std. Deviation (7.9 $\pm$  0.95). This finding was highly supported by the study of **Hubert, et al., 2013** who study How frequently should basic cardiopulmonary resuscitation training be repeated to maintain adequate skills?, mentioned that practice of the studied sample were average .

The current finding shows that nurse practice effected by their level of education, it was found that BSc nurse were highly stander of practice while the diploma, technical nurses were average stander of practice, with observation of BSc were highly practice level in the group of assessment . The current finding was highly supported by the study of **Handly and Handly 2013**, who study Improving CPR performance using an audible feedback system suitable for corporation into an automated external defibrillator, mentioned that the high level of education is associated with increase competence level in Resuscitation.

The current finding showed the multiple comparisons between practiced levels of different education level. It was found that that BSc level was high with statistically significant in practice level of nurses, while there was no significant for technical and diploma. This finding in an agreement with the study of **Timsit et al., 2010** who study the Evaluation of a continuous training program at Bichat hospital for in hospital cardiac arrest resuscitation, mentioned that the comparison between the degree of evaluation and the practices were highly effect on the level of performance of nurses, meanwhile there was significance notification among the high level of qualification regarding their practices

### **Conclusion:**

Nurse's performance (Knowlegde and practices) was average regarding basic cardiopulmonary resuscitation (CPR).

### **Recommendation**

- Additional educational program for nurses regarding CPR to keep them in touch with new advances.
- Development of a guideline leaflet for nurses about CPR should be disrupted.
- Designing and carrying out programs to support the patient and their families post.
- Applied several nursing approach as evidence based nursing practice, critical thinking and clinical path way to prove nurses knowledge, practice and evaluate the effects of CPR training program on their actual performance
- Continuous nurses evaluation and monitoring their follow up care for the CPR.



- Regular assessment and monitoring of factors hindering compliance during follow up among Nurses
- Further researches should be conducted to improve the nurses' knowledge, practice and attitude regarding CPR.

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