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Survey

Unit Knowledge and Practice of Emergency Nursing Interventions at a Tertiary Public Cardiac Health Center in Uganda

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Citation: Namukwaya H, Aliga CA, Nakate G, Mutyabule J (2022). Unit knowledge and practice of emergency nursing interventions at a tertiary public cardiac health center in Uganda. *International Journal of Critical Care* 16 (2):56-74.



Academic Editor(s): Ged Williams, RN, Crit. Care Cert., LLM, MHA, FACN, FACHSM, FAAN and Elizabeth Papathanassoglou, PhD, MSc, RN

Managing Editor: Patricia Zrelak, PhD, RN, NEA-bc, SCR, CNRN, FAHA

Published: September 18, 2022

Acknowledgments: All the nurses at the Cardiac Centre for their time and commitment to the study. Management of Uganda Heart Institute, Mulago Hospital for the moral support, and the Nursing faculty at Aga Khan University in Uganda for the guidance rendered towards this study project.



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ABSTRACT

Background: Research suggests that many of the millions of deaths and long-term disabilities resulting from acute cardiovascular events and other emergency conditions are preventable if effective emergency care services were readily available. Effective emergency care requires trained and competent staff, including registered nurses. Most educational pathways do not adequately prepare nurses to deliver sensitive health care services for those with acute illness and injury. This includes Uganda, where few capacity-building initiatives have targeted emergency nursing care delivery, leading to knowledge and practice gaps.

Purpose: This study aimed to assess emergency nursing knowledge and clinical practice at a tertiary public cardiac health facility in Uganda.

Method: This was a single-center, descriptive cross-sectional survey of a convenience sample of nurses working in the emergency department.

Results: A total of 49 emergency care nurses completed the survey (response rate of 81.6%). Among the participants, 75.5% were females, 65.3% had a bachelor's degree, 28.6% had Basic Life Support training, and 12.2% were certified in Advanced Cardiac Life Support. Additionally, 75% of the respondents had low proficiency in assessing critically ill patients, 100% could not perform safety checks, 50% could not maintain patent airways or complete patient handover, and only 50% could connect a patient to a defibrillator.

Conclusion: We report that the most significant gap in nurse-provided emergency care is the application of practical skills. Capacity-building initiatives are required to improve the knowledge and practice of nurses in emergency care delivery.

Keywords: knowledge, nursing, emergency care, education, cardiac life support, Uganda

BACKGROUND

Most of the world's population does not have timely access to quality emergency care (EC) such as cardiopulmonary resuscitation (CPR) and advanced cardiac life support (ALCS) (Chang et al., 2016; Mowafi et al., 2019; WHO, 2020). Quality EC systems provide EC in health care centers to ensure the delivery of safe, cost-effective, and efficient emergency services to all clients (Atakro, et al., 2018).

Quality emergent care facilitates early recognition and life-saving interventions for time-sensitive acute injuries and illnesses, where a delay of minutes or hours may result in avoidable death or disability (Werner, et al., 2020). Emergency care must be well planned and supported at all levels. While specialized knowledge and the ability to treat emergent conditions date to antiquity, EC as a medical specialty is only around 55 years old (Papi & Bahrami, 2020; Tsegaye et al., 2015). Emergency nursing has emerged as an additional specialty, where nurses care for patients in the emergency or the critical phase of their illness or injury.

An important aspect of emergency nursing is the knowledge and ability to perform critical tasks. One such task is CPR (Jensen, 2018). Yet studies show that the knowledge and skills to perform CPR decline over time, and within six months of initial CPR training (Anderson et al., 2019; Everett-Thomas et al., 2016; Sternbach et al, 1984). Nurses' abilities to retain ACLS competency degrades even faster than BLS over the certification period (2-years) with better retention of theoretical skills than psychomotor skills (Fukada, 2018). However, performance improves when nurses are certified and attend relevant life support training courses (Hamilton, 2005; Rajeswaran et al., 2018).

While the American Heart Association (AHA) recommends regular skills development for BLS and ACLS, mandatory acquisition of these skills is currently not a requirement in the Ugandan Health Care System (Field et al., 2010; Munezero et al., 2018). Although formal certified BLS and ACLS training of healthcare professionals leads to definitive improvement in the outcome of emergency resuscitation (Sodhi et al., 2011), these courses are taken by healthcare workers in Uganda voluntarily.

Nurses are often the first health care professionals to identify a patient with cardiopulmonary arrest in the hospital setting and, therefore, should possess adequate competency to provide effective resuscitation (Victor, et al., 2016). In the EC setting, patient assessment starts at the triage station where the nurses are responsible to determine the severity of the patient's illness so that resources are appropriately assigned. The severity of a patient's illness is determined by identifying signs and symptoms that indicate the severity of the illness and a color code is assigned to indicate the triage category. According to the new draft of *Uganda Triage and Treatment Algorithm (MoH, 2022)* adapted from WHO (2018), patients with severe life-threatening illnesses are triaged RED (require immediate intervention), patients with moderate life-threatening illnesses are triaged YELLOW (require interventions with 30 minutes), and patients with mild life-threatening symptom are triaged GREEN (require interventions within 2-hours)(WHO, 2018). To carry out the interventions to address life-threatening illnesses, nurses require a solid foundation of knowledge and experience to actively monitor and treat acutely ill patients with life-threatening conditions (Jensen, 2018).

Several studies have documented insufficient knowledge, healthcare provider attitude, and lack of EC standards contributing to poorer patient outcomes, including increased mortality (Mowafi et al., 2017; Victor et al., 2019). Similarly, Yaqoob et al. (2019) and Duko et al. (2018), highlighted the association between low nurse knowledge in the provision of EC to low level of competence in critical care areas, lack of continuous

professional development sessions, attendance at seminars, simulation-based training, and lack of spot check, audits, and quality improvement training initiatives at nursing institutions. Heery et al. (2019) reported that significant gaps exist between evidence-based guidelines and current practices, while nurses' knowledge and attitude variations result in inconsistent practices. Therefore, these gaps impacting patients' physiological and psychological outcomes must be addressed.

According to WHO (2019), the global disease burden of conditions needing EC accounts for 24% of all healthcare, which is provided by only 3% of the world's healthcare providers with few of whom has specialization in EC. In Sub-Saharan Africa (SSA), there are components of essential acute and EC that are optimally established. However, there is no accord on defining the success of practice improvement initiatives, including knowledge, and practice of all cadres of health care personnel, nor a current advocacy plan for placing EC on the global health agenda (Calvello et al, 2013).

In developing countries, including Uganda, Emergency centers are staffed with Registered General Nurses (RGNs) with no additional formal training in emergency nursing (Atakro et al., 2018). This situation may jeopardize the outcome of patients with acute illnesses or injuries, thus increasing the need for critical and EC training. Moreover, there is no systemic approach to discussing specialized training and the importance of emergency nursing in Africa.

Werner et al. (2021) noted that Uganda's burden of emergency conditions is devastating, with 1191 deaths occurring from emergency conditions per 100,000 people and an annual 52,441 disability-adjusted life years (DALY) per 100,000. This is attributed to limited public hospitals having dedicated emergency units with trained nurses (Kobusingye, 2018). Therefore, Uganda experiences a high morbidity and mortality burden due to conditions amenable to EC (Werner et al., 2021). Consequently, 75% of hospitals in Uganda fail to deliver even the most basic EC services (Holmberg, et al 2017; Balikuddembe, et al., 2017). This situation can be attributed to EC in Uganda still being in its infancy with limited training to fill the gaps across the country (Kivlehan, et al., 2021). Supporting these findings, Ruhwanya et al. (2018) reported that evidence-based nursing practice, a path to improving nursing practice, has remained unclear in many institutions.

Therefore, this study sought to assess nurses' self-report of knowledge, and practices in EC at the cardiac health facility to help improve service care delivery and patient outcomes.

METHODS

Design

We used a quantitative descriptive cross-sectional survey design.

Setting

The research setting was at a tertiary public cardiac health Centre in Uganda offering a wide range of cardio-thoracic EC services. Services offered at this facility include open-heart surgeries (e.g., mitral valve replacement, tetralogy of Fallot repair) and closed heart procedures (e.g., coronary angiograms, patent ductus arteriosus device insertions). The

cardiac health facility-has a bed capacity of 200 beds, and the emergency unit has a bed capacity of 5 beds and employs 60 nurses. The facility has six functional divisions: the Intensive Care Unit (ICU), Coronary Care Unit (CCU), Catheterization Laboratory (Cath Lab), Out-patient Department (OPD), Operating Theatre, and General Ward.

Sample

The researchers used convenience sampling and recruited available nurses from the six divisions. Registered nurses with work experience of at least one year at the facility were included in the study. Registered nurses were excluded if they were not available at the time of data collection, were involved in other similar studies at the time of data collection or were unable or unwilling to consent to the study.

Instrument

Researchers adapted a four-part data collection tool developed by (Adenekan, et al., 2016; Mohamed, et al., 2019, Papi, et al., 2020) (Appendix 1). The first part addressed the demographic characteristics of the participants, followed by part two with 25 multiple choice knowledge-based questions. Part three of the tool addressed perceived attitude, with 6 questions on job satisfaction, 12 questions on teamwork, 4 questions on unit management, and 2 questions on safety. All the questions on knowledge and attitude were rated on a Likert scale ranging from 0 (I don't know) to 4 (strongly agree). The fourth part of the tool addressed clinical practice. There were 4 questions related to patient reception and 35 questions on triage. Scoring ranged from 0 to 1 (not adequate) to 5 (excellent). Scores below 50% relating to Practice were considered as poor, 50 to 80% as good, and above 80% as excellent (Adenekan et al., 2016; Vural et al., 2017).

Data regarding practice was obtained through observation of the nurses' practices (Polit & Beck, 2020). Researchers performed the observation process without the nurses' knowledge for a period of 8 hours for 3 days and four nurses were observed in 40 areas of competencies. The researcher always worked with the nurses throughout the day shift while paying attention to pertinent areas to observe. The researcher specifically observed the process through which the nurse on duty receives patients and how the same nurse performed triage of the patients and carried out the related interventions.

The supervisors and experts in EC validated the tool. Furthermore, the tools were piloted at a private cardiac facility in Kampala among five nurses with the same characteristics; registered nurses, and adjustments were made according to the findings. The internal validity was 0.7 using Cronbach's Alpha.

Ethics approval

Data were collected after study approval from the Aga Khan School of Nursing and Midwifery, the Ethics and Research Committee of Mulago National Referral Hospital, and the cardiac facility ethics committee. The principal Nursing officer organized a meeting for the cardiac facility to provide participants with information regarding the study. This included the assurance of confidentiality and the right to withdraw at any time.

Data analysis

Collected data were analyzed using descriptive statistics using SPSS Statistics for Windows, version 22 (Chicago, Ill., USA). Results were presented in graphs and tabular manner and

then converted to a percentage scale.

RESULTS

Demographics

After obtaining their written consent, a sample of 49 (out of 60) nurses was recruited with a response rate of 81.6%. Of the respondents, 27(55.1%) were above the age of 35 years, 37(75.5%) were female, 32(65.3%) had bachelor's degrees, 10(20.4%) had diplomas, and 53.1% had worked for more than 10 years. To the open-ended question of additional qualifications, 79.6% reported having no additional training and 16.3 had trained in other fields. The Cath Lab, Operating theatre, OPD, and General Ward had the lowest number of participants (less than 8 as shown in Table 1).

Knowledge of emergency care

Of the respondents, 98% were able to define an emergency while only 49% were unable to define EC, even if they received related CME training. Among those who received CME, 18.4% had training on BLS, 12.2% had on both BLS and ALS while 10.2% had training on ALS only, with the majority (57.2%) having training in other fields and only 2% had trained in cardiac EC. Results further indicate that 71.4% did not understand BLS and ALS, but the majority 87.8% knew the interventions to perform if there was no pulse and 85.7% knew when an *automated external defibrillator* (AED) should be used, but only 30.6% understood the characteristics of high-quality CPR (Figure 1).

Observational data on emergency care practice

Four (n=4) participants were evaluated for their clinical skills. They exhibited excellent skills (score of 5) in oxygen administration, connecting patients to monitors, ECG/Holter performance, and seeking clarification from doctors about the treatment plan (Table 2). Half were very good (score of 4) and half were excellent (score of 5) at taking appropriate vital signs and insertion an indwelling urinary catheter.

Most respondents portrayed fair ability (50%) in the key areas required for quality EC such as taking action to manage patients' changing conditions, obtaining consent, ensuring adequate ventilation, evaluating patients' response to treatment, communicating pertinent information about patients' status, prioritizing actions based on findings and giving a complete hand over about patients. Respondents showed poor performance in several skills, including head-to-toe assessment, safety checks, reception of emergencies and ensuring that patients receive immediate care within 30min to 2 hours, ensuring patent airways, following the ABCD approach, updating patients' care plans depending on the situation and documentation of care rendered.

Table 1. Demographics of nursing completing emergency care survey

Demographic characteristics	Frequency (N=49)	Percent
Years of age		
20 -25 years	9	18.4
26 - 35 years	13	26.5
36- 45 years	23	46.9
Above 46 years	4	8.2
Gender of participants		
Female	37	75.5
Male	12	24.5
Current Level of education		
Diploma level	10	20.4
Bachelor's level	32	65.3
Masters level	7	14.3
Current head position		
Unit head	5	10.2
Deputy unit head	5	10.2
None	39	79.6
Years of work experience		
1 - 5 years	9	18.4
5 - 10 years	14	28.6
More than 10 years	26	53.1
Unit of work placement		
ICU	17	34.7
CCU	9	18.4
CATH LAB	5	10.2
Theatre	5	10.2
Outpatient Department	6	12.2
General ward	7	14.3
Administration	3	6.1
None	39	79.6
Cardiac Critical Care	2	4.1
Health management	4	8.2
Health management and critical care	1	2.0

Figure 1. Participant Knowledge of Emergency Care During

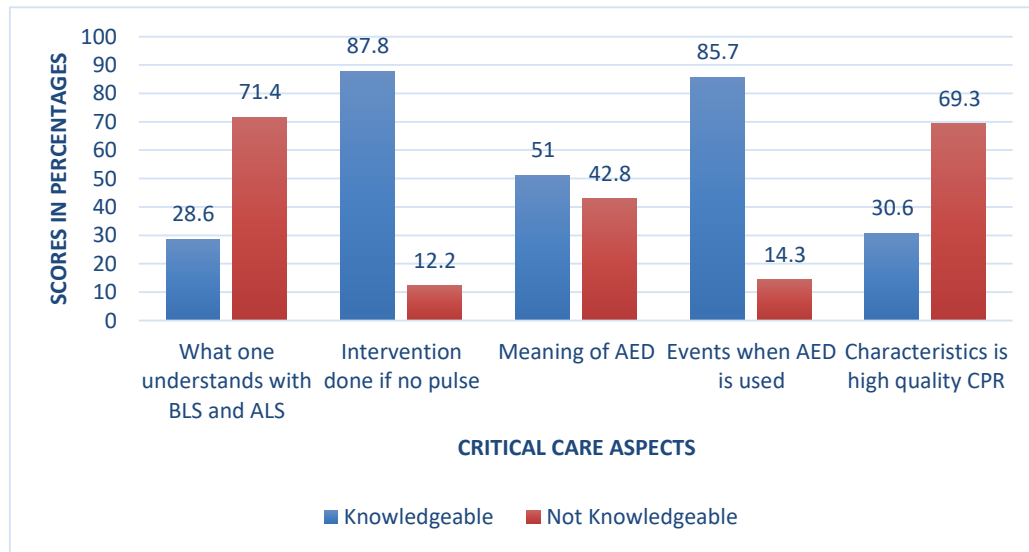


Table 2. Observed Practice Scores of a Sub-set of Participants

Abilities	Not Adequate	Fair	Good	Very Good	Excellent
Ability to receive an emergency patient	2 (50%)	1 (25%)		1 (25%)	
Ability to obtain informed consent from patients	1 (25%)	3 (75%)		0	
Ability to assess situation or condition	1 (25%)	1 (25%)	2 (50%)		
Ability to ensure emergencies receive immediate care	2 (50%)	1 (25%)	1(25%)		
Ensuring that urgent patients receive care within 30 min - 2 hours	2 (50%)			1 (25%)	1 (25%)
Ensures protective measures to self and patient		2 (50%)	2 (50%)		
Takes appropriate vital signs				2 (50%)	2 (50%)
Takes complete history of patient and from relatives	2 (50%)		2 (50%)		
Performs head to toe assessment	3 (75%)	1 (25%)			
Performs diagnostic tests like ECG/ Holter				4 (100%)	
Takes off blood for laboratory investigations			3 (75%)	1 (25%)	
Follows ABCDE method	3 (75%)	1 (25%)			
Ensures a patent airway	2 (50%)	1 (25%)	1 (25%)		
Provides adequate ventilation	1 (25%)	3 (75%)			
Evaluates cardiac output	1 (25%)	3 (75%)			
Determines Neurological		3 (75%)	1 (25%)		

disability					
Ability to perform safety checks	4 (100%)				
Ability to connect defibrillator	1 (25%)	1 (25%)	2 (50%)		
Ability to administer oxygen					4 (100%)
Ability to connect to monitor					4 (100%)
Cannula insertion and volume resuscitation			2 (50%)	2 (50%)	
Ability to administer adrenaline			2 (50%)	2 (50%)	
Ability to insert urinary catheter				3 (75%)	1 (25%)
Performs drug calculations and administration		1 (25%)	3 (75%)		
Ability to document nursing care rendered	3 (75%)	1 (25%)			
Complete patient handover	2 (50%)	2 (50%)			
Vital assessment for deteriorating patients	3 (75%)	1 (25%)			
Utilizing decision making skills to determine actions	1 (25%)	3 (75%)			
Taking action to manage patient changing condition		4 (100%)			
Prioritizing actions based on assessment findings	1 (25%)	3 (75%)			
Assessing resources to assist in patient management		3 (75%)	1 (25%)		
Reporting findings to health care team	1 (25%)	2 (50%)	1 (25%)		
Communicating pertinent information about patient's status	1 (25%)	3 (75%)			
Understanding rationale for actions and orders		2 (50%)		2 (50%)	
Seeking clarification from doctors about treatment plan				4 (100%)	
Evaluating patient's response to treatment		2 (50%)		2 (50%)	
Updating patient's care plan depending on situation	2 (50%)		2 (50%)		
Reflecting on management of patients' rapid change of condition		3 (75%)	1 (25%)		
Extrapolate Knowledge from the reflection		1 (25%)	3 (75%)		

DISCUSSION

Knowledge of EC and basic emergency techniques can increase the chances of patients' survival. Therefore, health care providers must have the knowledge, good attitude, and ability to manage emergency patients accurately. Educators, students, and nurse

practitioners must endeavor to develop the knowledge necessary to manage emergencies effectively (Jun et al., 2016). We employed a combination of personnel surveys to assess training and EC knowledge and observations to score competency levels in EC. The most important findings of this study were: a) low percentages of responders with specialized EC training and knowledge, b) several areas of fair to high competency in EC procedures, and c) several areas of low to poor performance.

In our sample, the majority (65.3%) held a bachelor's degree and had a work experience of over ten years, in agreement with Eastwood et al., (2012) in Australia, who indicated that most of the nurses who work in ICUs generally have a bachelor's degree in nursing to be able to perform tasks effectively. Durgun and Kaya (2018) suggested that professional experience had a positive impact on patient safety.

Very few respondents (20.4%) had acquired additional training in relevant fields like ACLS and BLS, meaning the majority (79.6%) lacked the fundamental training in EC and its competence. They only hold a few CMEs whose content and effect on the output could not even be verified. However, according to Victor et al., (2016), nurses are the first health care professionals to identify patients with cardiopulmonary arrest in hospital settings. This is not surprising since there are no recognized training courses for emergency nursing in Uganda. (Friedman. 2019). A few centers that offer ACLS and BLS training also do not prioritize enrollment for nurses. This limitation to training further limits the ability of nurses to provide quality EC. Studies have shown that a low level of knowledge impacts nurses' competencies in EC (Mohamed et al., 2019; Ruhwanya, et al., 2018; Vural et al, 2017).

Consequently, based on participants' gaps in knowledge, it was not surprising to find that most of the nurses exhibited a very low level of competency. Poor performance on basic emergency procedures like performing a head-to-toe assessment or following the ABCDE bundled protective care protocol can increase patients' risk of poor outcomes. According to Hilary's study (2021), it is up to health care institutions to ensure that their staff members receive adequate training regularly to maintain their levels of competence. It has also been highlighted that continuous training is required for nurses, especially when learning how to use sophisticated machines and skills in advanced procedures like defibrillation, and 12-lead ECG interpretation, while others require considerable repetition in training and clinical practice to keep up and performance improves when practicing relevant life support training courses. (Papi and Bahrami (2020); Tsegaye, et al (2015); Anderson (2019); Everett-Thomas, (2016).

Torres (2019) and Ronda (2015), emphasize that the structure of the work environment provides conditions that can empower nurses, enabling them to be effective throughout all levels, reduce stress, promote nurse satisfaction, and financial costs or create a sense of powerlessness, which may influence patient and staff relationships. On the other hand, even with good attitudes, knowledge is very important for better EC. As Rajeswaran et al, (2018) and Durgun and Kaya (2018) rightly stated, "Educational level of nurses should correlate with the quality of patient care and decrease interventions that endanger patient safety".

CONCLUSION

Competent EC nurses with sound knowledge and practice skills are key in any healthcare organization contributing to increased patient survival, satisfaction, and reduced complications and adverse outcomes. Our study identifies several gaps in nurses' training, knowledge, and competencies at a specialized acute cardiac healthcare facility in Uganda. The findings suggest the need for specialized training, and evaluation of staff competence to ensure quality and safe care and service delivery.

LIMITATIONS

This was a single-center study undertaken among nurses working at a specialized cardiac institution that provides services to only cardiac patients, so the results may not be applied to all emergency nurses. The study center had more highly qualified nurses than the general Ugandan hospital setting. Additionally, this was an observational study with limited participation. Therefore, results need to be interpreted carefully in consideration of the level of the facility, staff experiences, and existing guidelines of the facility. Future associations between knowledge and competency and nurses' characteristics must be pursued.

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Disclosures: Declarations of interest, none.

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Appendix 1

Questionnaire {Adopted from a similar study in Lagos – Nigeria}

Age: 20- 25 years 26- 35 years 36- 45 years above 46 years

Gender: Male Female

Academic qualification: Diploma BScN Masters

Current position: Unit head Deputy Unit head None

Work experience: 1- 5 years 5 – 10 years more than 10 years

Current unit: ICU CCU CATH LAB Theatre OPD Ward

Any added qualification, please specify; _____

Knowledge: Please circle/ tick the appropriate answer

1. What do you understand by the term emergency?
 - a) Is a serious, unexpected and often dangerous situation requiring immediate action
 - b) Is unexpected occurrence or occasion that does not require immediate action
 - c) Is unforeseen combination of dangers
 - d) Is a situation when someone collapses
2. What is emergency care?
 - a) Performance of acts or procedure under emergency actions
 - b) Is a branch of medicine dealing with chronic illnesses only
 - c) An integrated platform to deliver time-sensitive health care services to acutely ill patients
 - d) None of the above
3. Does this hospital have any emergency care protocols/ guidelines? Yes or No
4. If yes, do you know where the emergency protocols are in your hospital? Yes or No
5. Have you ever read or applied the guidelines in your practice? Yes or No
If No, state why? _____
6. How often are emergence guidelines/ protocols updated?
 - a) Annually
 - b) Quarterly
 - c) Monthly
 - d) I don't know
7. Have you ever received any CME /specialized training in emergency care? Yes or No
If yes, specify it, and when? _____

8. What do you know about BLS/ ALS? _____
9. You are a nurse at the triage area at OPD, you recognize a patient with cardiac arrest. What would you do?
 - a) Continue with patient screening
 - b) Check for responsiveness and shout for help
 - c) Leave the victim and look for the doctor
 - d) Perform an ECG
10. If no pulse; what would you do?
 - a) Administer oxygen by mask
 - b) Begin compressions
 - c) Call for help
 - d) Administer 2 breaths
11. What does abbreviation AED stand for?
 - a) Advanced Electrical Defibrillator
 - b) Automated External Defibrillator
 - c) Advanced External Defibrillator
 - d) Automated Electrical Defibrillator
12. In what circumstances is the AED used?
 - a) During scene safety verification
 - b) During emergence monitoring
 - c) During drug administration
 - d) After shockable rhythm recognition
13. Quality CPR improves patient's chances of survival, characteristics of high-quality CPR include;
 - a) Interruption of emergency resuscitation
 - b) Compress the chest continuously at a rate above 120/ minute
 - c) Shock the patient
 - d) Start compression within 10 seconds upon recognition of cardiac arrest
 - e) Administer adrenaline
14. Approach to resuscitation requires the following except;
 - a) Emergency equipment
 - b) Local protocols
 - c) Health education
 - d) Trained emergency care providers
15. Which statement best describes a sudden cardiac arrest?
 - a) When respiratory distress occurs and heart rate does not change
 - b) When heart rate is 40-60 b/m and respirations increase
 - c) When the blood flow to the heart is blocked and the heart rate increases
 - d) When an abnormal rhythm develops and the heart stops beating unexpectedly

16. What is the recommended way to determine the location point of chest compression?
 - a) Find the center of the chest
 - b) Epigastrium
 - c) Lower sternal edge
 - d) Apex of the heart
 - e) I do not know
17. What is the recommended depth of chest compression?
 - a) Depth of 5-6 cm
 - b) Depth of 10 cm
 - c) Depth of 2 cm
 - d) I don't know
18. What is the recommended ratio of adult chest compressions to ventilation?
 - a) 15:2
 - b) 30:2
 - c) 100:1
 - d) I don't know
19. The dose of adrenaline while managing the pulseless electrical activity (PEA) is?
 - a) 1mg/kg
 - b) 1ml
 - c) 1mg/kg²
 - d) I don't know
20. What are the shockable rhythms? (Multiple responses are allowed)
 - a) Ventricular fibrillation
 - b) Ventricular tachycardia
 - c) Pulseless electrical activity
 - d) Atrial fibrillation
 - e) All the above
21. What treatment does a victim whose life-threatening condition is "not breathing" need?
 - a) Twelve to fifteen rescue breaths per minute, and correct CPR
 - b) The Heimlich maneuver, two rescue breaths and CPR
 - c) Start CPR immediately
 - d) You should follow steps of rescue breathing
22. Sharp, stabbing twinges of pain in the chest is a sure sign of heart attack
 - a) True
 - b) False
 - c) I don't know
23. When two or more providers are performing CRP on an infant, the compression to ventilation ratio and preferred chest compression method is?
 - a) 30:2 with two thumbs and the fingers encircling the chest

- b) 15:2 with two thumbs and the fingers encircling the chest
 - c) 30:2 with fingertips placed just below the nipple line
 - d) 15:2 with finger tips place just below the nipple line
24. Serious damage to the brain can occur after how many minutes without oxygen?
- a) After 20 seconds
 - b) After 10 seconds
 - c) After 2 seconds
 - d) After 2 minutes
25. Which of the following should be documented in the nursing notes after resuscitation?
- a) Drugs administered and their doses
 - b) Resuscitation cycles and time taken until ROSC (Return of spontaneous circulation)
 - c) Parameters during resuscitation
 - d) Recording consumes time, it's not required at that moment
 - e) a, b and c

PRACTICE: Observational Check list

Nursing emergency care Core scale 0- 5 (Similar study from Cairo University- Egypt and Malaysia) Where, 0-1 is not adequate, 2 is fair, 3 - good, 4 – very good, 5 – Excellent

Practice	0	1	2	3	4	5
Patient receival						
Ability to receive an emergency patient						
Ability to obtain informed consent from the patient or relatives before beginning of care						
Ability to assess situation/ condition						
Ability to ensure that emergency patients receive care immediately						
Triage						
Ensures that urgent patients receive care within 30 minutes – 2 hours						
Ensures protective measures to self and patient						
Takes appropriate vital signs						
Takes complete history of patient or from relatives						
Performs head to toe assessment						
Performs diagnostic tests like ECG, Holter						
Takes laboratory tests						
Follows ABCDE method						
Ensures a patent air way						

Provides adequate ventilation						
Evaluates cardiac out put						
Determines neurological disability						
Ability to perform safety check, prepare emergency tray and intubation set						
Ability to connect defibrillator						
Ability to administer oxygen						
Ability to connect to monitor						
Cannula insertion and volume resuscitation						
Ability to administer adrenaline						
Ability to insert urinary catheter						
Performs Drug calculation and administration						
Documentation						
Complete Patient hand over						
Assessment of signs and symptoms of deterioration of patients with cardiac conditions						
Utilizing decision making skills to determine actions						
Taking action to manage patient changing situations						
Prioritizing actions based on assessment findings						
Assessing resources to assist in managing patient's situation						
Reporting findings to members of the health care team						
Clearly communicating pertinent information about patients' status						
Understanding rationale for actions and orders						
Seeking clarifications from doctors or colleagues on concerns regarding treatment plan						
Evaluating patients' response to treatment						
Updating the plan for care reflecting the patient's current clinical condition						
Reflecting on process of managing rapidly changing patient's situation						
Extrapolate knowledge from the reflection process to apply in managing future patient situations						