Assessment of Nurses' knowledge and Practice regarding Antiarrhythmic Medication at Critical Care Units

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Abstract

Antiarrhythmic medications are a group of pharmaceuticals that are used to suppress abnormal rhythms of the heart. Cardiac nurses are responsible for preparing and administering antiarrhythmic medications. **Aim:** The current study aimed to assess nurses' knowledge and practice regarding antiarrhythmic medication at critical care units. **Subjects and method:** A descriptive study design was utilized to conduct the current study. **Subjects**: A purposive sample of all available staff nurses working in Critical Care Units at Suez Canal University Hospital (3 Critical Care Units). Tools were collected using an interviewing questionnaire and an observational checklist. **Results:** Current study result revealed that the mean score of the total nurses' knowledge was (42.03±1.28) out of 45. Also, the total mean knowledge score regarding antiarrhythmic medications was (17.83±. 85) out of 19, while, the mean score of total practice was (25.53±2.08) out of 32. Also, the mean of the administration phase was (15.13±2.37) out of 19. **Conclusion:** The current study concluded that, although most nurses working in Critical Care Units at Suez Canal University Hospital has a high level of knowledge, they have poor practical skills regarding antiarrhythmic medication. **Recommendations:** A standard guideline, protocol explaining how to care for patients with life-threatening arrhythmias, and safety of an antiarrhythmic drug, should be available for nurses.

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Key words: Antiarrhythmic, Critical Care Units, knowledge, Medication, Nurses, Practice.

1. Introduction

Medication safety during administration is a major concern at a global level and is related to the safety and quality of patient care. Medication errors (MEs) are unintended failures in the drug treatment process that can occur during prescription, dispensing, storing, preparation, and administration of medications. Nurses are responsible for the administration of "high-alert medications (HAMs)" incorrect administration can have a significant clinical outcome, and at times is fatal **(Sa'ed et al., 2019).**

High-alert medications are drugs that bear a heightened risk of causing significant patient harm while they are used in error. Although mistakes may or may not be more common with these drugs, the consequences of error are more devastating to patients. When any medication can potentially cause harm, a select group of drugs "high-alert medications (HAMs)" carries a higher risk of patient injury **(Subbaiah et al., 2021).**

Antiarrhythmic agents, also known as cardiac dysrhythmia medications, are considered high alert medications. and it is a group of pharmaceuticals that are used to suppress abnormal rhythms of the heart (cardiac arrhythmias), such as atrial fibrillation, atrial flutter, ventricular tachycardia, and ventricular fibrillation. Antiarrhythmic drugs may be prescribed for people with tachycardia (fast heart rate) or premature or extra heartbeats. These medications work to correct the rhythm of the heart **(Hyman et al., 2018).**

The antiarrhythmic medications have typically been categorized according to the Vaughan-Williams (VW) classification system. The system classifies the medications according to the main mechanism of action. The VW classification is traditionally broken down into four main categories. This activity covers the major classes of antiarrhythmic medications, reviews the indications, contraindications, activity and adverse events **(King, Goyal, Grigorova, & Hashmi, 2021).**

Cardiac monitoring provides continuous observation of the patient's heart rate and rhythm and is a routine nursing procedure in all types of acute and critical care units as well as in all emergency departments. The goals of cardiac monitoring can range from a simple heart rate and basic rhythm monitoring to sophisticated dysrhythmia diagnosis and ST-segment monitoring to detect cardiac ischemia **(Suzanne M. Bums & Sarah A. Delgado, 2019).**

Nursing process for patients with cardiac arrhythmia due to digitalis toxicity includes prompt assessment of the patient's condition such as (Palpate pulses, noting rate , regularity,

document presence of pulses alternant, Auscultate heart sounds, noting rate, rhythm, presence of extra heartbeats, and Monitor vital signs). As well as ,prompt treatment of symptoms, and investigation of the cause **(Panchal et al., 2018).**

Significance of the study:

A critical care nurse is a vital part of the health care providers, the process of medication administration is considered as one core nursing action that spend about 40% of their time in the hospital for administering medications. In addition, the nurses' competency and following intervention teaching guidelines for high alert medications administration is a warranty for quality of nursing care and critically ill patients' safety. Also, there are many reasons for medication administration errors done by a nurse, which are inadequate training, lack of knowledge regarding high alert medications. Furthermore, in Egypt and developing countries, it is difficult to obtain precise data and statistics regarding medication administration errors due to improper archiving and reporting system. Most of those medications are categorized as" antiarrhythmic medications" Therefore, there are intense need to assess nurses' knowledge and practice regarding those types of medications **(Allawy, Sherief, El–Ata, & Gaballah, 2020).**

The aim of the study: The current study aimed to assess nurses' knowledge and practice regarding antiarrhythmic medication.

Research questions:

Q1: What is the level of nurses' knowledge regarding antiarrhythmic medications at critical care units ?

Q2: What is the level of nurses' practice regarding antiarrhythmic medications at critical care units ?

2.Subject and Methods

2.1. Study design: A descriptive study design was utilized to conduct the current study.

2.2. The sample of the study: A purposive technique was utilized to collect the sample and 92 nurses out of (125 nurses) participated in the research who matched the inclusion criteria .

2.3. Inclusion criteria:

- The nurse has experience of more than six months in the Critical Care Unit.
- The nurses were assigned to work, and willing to participate in the current study.
- The nurses were assigned to the arrhythmic patient.

2.4. Study setting: This study was conducted at critical care units (Intensive Care Unit, Cardiac Care Unit, Cardiothoracic Care Unit) in Suez Canal University Hospitals.

2.5 Tools of data Collection:

2.5.1 Tool I: Demographic data:

It will include data related to nurses' gender, age, and educational level, area of work, experience in nursing field, years of experience in ICU and any training course regarding to arrhythmia and antiarrhythmic medications.

2.5.2 Tool II: Antiarrhythmic Knowledge Questionnaire:

It was developed by the researcher and filled by nurses, This sheet contained 45 multi choice questions revealed the nurses' knowledge about the definitions, classification, action, indication, contraindication, side effect, and nursing measures with antiarrhythmic medications **(King et al., 2021).**

2.5.3. Scoring system:

The total score was ranged from 0-45 points for 45 questions. Right answer marked with (1) point and incorrect answer marked with (0) point. Satisfactory knowledge level was equal to or more than 85% and unsatisfactory knowledge level was less than 85% **(Samanta, Thiagalingam, Turner, Lakkireddy, & Kovoor, 2018).**

2.5.4. Tool III: Antiarrhythmic medication administration observational checklist:

It was designed by the researcher through literature review and filled by researcher to assess nurses' practices related to administration of selected antiarrhythmic medications. The designed tool consisted of 32 steps **(Zakria & Mohamed, 2017).**

2.5.5. Scoring system:

The total score of the observational checklist was ranged from 0 to 32 of the 32 steps. The possible choice for each step was done and not done. Each nurse was given (1) point for done step and (0) for not done step. Satisfactory practice level: Equal to or more than 90%. Unsatisfactory practice level: Less than 90% **(Zakria & Mohamed, 2017).**

2.5.6.Reliability of the Tool:

Reliability of the tool was assessed using Cronbach's Alpha .

Items	N of items	Alpha Cronbach's
Knowledge regarding antiarrhythmic	45	.816
Practice regarding Antiarrhythmic	32	.721

2.6. Field work:

Data were collected within 4 months period started at beginning of May 2020 to the end of August 2020.

The investigator selected the nurses according to the previous mentioned criteria.

The potential nurses who agreed to participate in the study were interviewed individually in nurses' office to explain the nature and the benefit of the current study to enhance better cooperation and get consent from nurses who agreed to participate.

Nurses' level of knowledge was assessed with self-administered questionnaire using tool (II). The questionnaire was completed within 30 minutes. two nurses were assessed / day.

Nurses' level of practice was measured using observational checklist (tool III). The researcher observed one to two nurse / day while administering antiarrhythmic medications to the patients.

2.7. Administrative design:

Official permission was obtained from the appropriate authoritative personnel at Suez Canal University Hospital to begin data collection by formal letter submitted from the Faculty of Nursing, Suez Canal University to the director of Suez Canal University Hospital to obtain a permission to conduct this study. Aim of this study was explained to the directors, physicians and staff nurses working in critical departments of Suez Canal University Hospital.

2.8. Ethical considerations:

Ethical approval was obtained from the Ethical Committee, Faculty of Nursing, Suez Canal University. Official permission to conduct the study was granted from hospital administrators. The aim and significance of the current study were explained for each nurse. Nurses were informed that they have the right to refuse participation or withdraw from the study whenever they want without any harm. Anonymity and confidentiality were secured by data coding. Moreover, nurses were informed that these data will not be reused in another study without their permission. Written informed consent was obtained from the nurses who agreed to participate.

2.9. Statistical design:

Data collected through the questionnaire were coded, entered and analyzed using Statistical Package for the Social Sciences (SPSS version 20).

The following statistical techniques were used:

⊠ Frequency and Percentage distribution.

⊠ Mean score degree $\overline{X}$.

⊠ Standard deviation SD.

⊠ Chi-square test.

⊠ Pearson correlation (r test)

3. Results:

Table (1): shows that 82.6% of studied nurses' age was between 20 to less than 30 years with mean age 26.01±3.32. Also, 81.5% of studied nurses had technical degree and 53.3% were female with the mean of the years of experience in nursing was 4.17% ± 3.45, while mean of nurses' Years of experience in critical care unit was 3.41±2.16.

Table (2): Illustrates that the mean score of the total nurses' knowledge was (42.03±1.28. Also, the mean score of Antiarrhythmic medications was (17.83 ±.85), while mean score of nursing role regarding antiarrhythmic medications was (11.25 ±.68).

Table (3): illustrates that the mean score of total practice was 25.53±2.08. Also, the mean of administration phase was 15.13±2.37.

Table (4): there was no significant correlation between total nurses knowledge and their total practice with **p value** > 0.05.

4. Discussion:

Medication administration is one of the primary functions of health care providers (HCP) especially nurses in the health care settings because safe, effective, and ethical medical practice is an important component of patients' care. Medication errors may be related to professional malpractice, products, procedures, and systems, including prescribing; order communication; product labeling, packaging; compounding; dispensing; distribution; administration; education; monitoring; and use. So, nurses need to ensure that drug therapy achieves maximum benefit without any complications (**Labib et al., 2018**).

Nurses, pharmacists, and other healthcare workers who look after patients with heart disease should be very familiar with the different antiarrhythmic agents. All antiarrhythmic drugs are also potentially pro-arrhythmic. Intravenous administration should be performed only under cardiac monitoring (**King et al., 2021**). Therefore, this study aimed to assess nurses' knowledge and practice regarding antiarrhythmic medication at critical care units in Suez Canal University Hospital. This chapter

discusses the results of the current study with relation to the study aim and research questions, comparing them with other related literature, and representing the researcher's interpretations of the present results.

Participants enrolled in the current study were 92 nurses providing care for patients in critical care units at the Suez Canal University Hospital. The demographic profile of participants in the current study showed that the majority of studied nurses' age was less than thirty years. Concerning gender, more than half of the subjects were female. These results were following a study done by, **El-Sayed Fekry et al.(2021)** who assess "Nurses' Performance Regarding Life-Threatening Ventricular Dysrhythmias among Critically ill Patients" clarified that the majority of the studied nurses' age less than thirty years old and more than half were female.

Furthermore results presented by, **Eldsouky et al. (2016)** who assessed Nurses' knowledge and practice concerning fluid and electrolyte balance among patients with congestive heart failure, Zagazig Nursing Journal**.** Illustrated that the majority of subjects consisted of females. Slightly more than half of them had their age below 30 years.

The current study findings revealed that nurses' years of experience in working were about 4 years, while nurses' years of experience in the critical care unit was about 3 years. These results were supported with a study done by, **El-Sayed Fekry et al.(2021)** who illuminated that more than half of the studied nurses had total years of experience in the hospital less than 5 years. Also more than half had more than 2 years of experience in the ICU.

On the other hand, results presented by **Eldsouky et al. (2016)** illustrated that less than two-thirds of study sample ranged from 7-10 of experience years. While, more than half of them ranging from 5 to 7 experience years in the Critical care units.

As regards the level of education and training course; in this study the majority of studied nurses not attended courses regarding antiarrhythmic medications. Also, most of them had a technical degree education. In the same context results presented by **Eldsouky et al. (2016)** illustrated that Less than half of study sample were having a bachelor's degree, with less than one third of the nurses in the study sample had attend training courses. Regarding the level of education, the result of the current study agreed with **Mohamed et al. (2020)** who their study aimed to assess nurses' knowledge and practices regarding care for patients with cardiogenic shock and found that the majority

of nurses, participate in the study had obtained the Technical Institute of Nursing diploma.

Opposite to the current study findings. In a study presented by **El-Sayed Fekry et al. (2021)** showed that most studied nurses were highly educated graduates from Faculties of Nursing, and the majority of the studied nurses had previously attended training in the critical care unit. A contradictory finding, reported by **Eltoom, (2017)** showed that more than half of the study sample were receiving training courses in intensive care units.

The results of the current study revealed that the majority of studied nurses working in critical care units had a satisfactory level of knowledge regarding arrhythmias and antiarrhythmic medications. All the components of knowledge questioner were highly satisfactory. The current study revealed that the majority of the studied nurses had a satisfactory total score of knowledge regarding antiarrhythmic medication, arrhythmias, and nursing roles regarding antiarrhythmic medications.

In congruent with the current study results, **Sa'ed et al. (2019)** in a cross-sectional study entitled **"**Knowledge about the administration and regulation of high alert medications among nurses in Palestine". It presented that when asked about the proper administration of high alert

medications, more than half of nurses had satisfactory knowledge about the administration and regulation of high alert medications.

In harmony with the current study findings, a study by **Ruhwanya et al. (2018)** entitled "Life-threatening arrhythmias: Knowledge and skills among nurses working in critical care units at Muhimbili National Hospital, Dar es Salaam, Tanzania" carried among a total of 141 nurses working in critical care areas, demonstrated that the level of knowledge regarding life-threatening arrhythmias among study participants was generally high.

Contradictory findings reported by **Fadalla, (2018)** in a study entitled "Impact of an educational program on recognition and management of ventricular arrhythmias guideline among critical care nurses in Khartoum City, Sudan" revealed that the fundamental knowledge regarding arrhythmia was unsatisfactory. Other opposite results reinforced with **Mousa et al. (2016)** in a study entitled "Nurses' Knowledge Concerning Early Interventions for Patients with Ventricular Tachycardia at Baghdad Teaching Hospitals, Kufa", illustrated that the overall assessment of nurses' knowledge about VT was low satisfactory.

The current study illustrated that, the majority of nurses had an unsatisfactory total practice score. In synchronization with our study results, **Hassan and Hassan, (2013)** in a quasi-experimental study aimed to evaluate the effectiveness of nursing education programs on the nurse's practice toward arrhythmia in Kirkuk's teaching hospitals, among a total of 80 nurses. Concluded that, the majority of nurses had unsatisfactory knowledge and practice toward arrhythmia before implementation of educational programs.

Moreover, **Mohamed et al. (2020)** found that most of the studied nurses had an inadequate level regarding care for a patient with cardiogenic shock including medication administration. Also, the current study result is supported by the result of a study done by **Binyameen et al., (2018)** which revealed that most of the studied nursing in the Coronary Care Unit had poor and unsatisfied performance regarding the administration of antiarrhythmic medications.

In contrast, **El- Sayed et al (2017),** denoted that about two-thirds of studied nurses had a satisfactory level of practice regarding the management of AMI within the golden hours including administration of thrombolytic therapy. Also, the current study result disagreed with the result of **Hessaen & Fadlalmola**,

(2020) who showed that most studied nurses had a satisfactory practical level regarding the administration of anti-arrhythmic medications.

The current study result demonstrated that there was no significant correlation between total nurses' knowledge and their total practice with a **p-value >** 0.05.

This finding is compatible with the study result submitted by **(Mousa, Owaid, Ahmed, Zedaan, & Sara'a, 2016)**. Who assess Nurses' Knowledge Concerning Early Interventions for Patients with Ventricular Tachycardia at Baghdad Teaching Hospitals, and showed that there was no statistically significant relation between staff nurses' Knowledge and their practice regarding life-threatening arrhythmias, at p=0.12

Contradictory findings reported by **El-Sayed Fekry et al. (2020)** proved that there was a statistically significant relationship between nurses' practice and their total knowledge in emergency management of life-threatening ventricular dysrhythmias at *p*-value=0.03.

5. Conclusion:

The current study concluded that, although most nurses working in critical care units at the Suez Canal University Hospital have a high level of knowledge, they have poor practical

skills regarding antiarrhythmic medication. It is important that hospital administration takes into consideration the identified areas of deficiency and work to improve the skills among nurses and enhance the optimal care of patients.

6. Recommendations:

Based on the finding of this study, the researcher recommended that:

1. Specific training on the detection and management of arrhythmias should be developed for critical care nurses.

2. A standard guideline protocol explaining how to care for patients with arrhythmias and safety of antiarrhythmic drug, should be available for nurses.

3. Hospital management need to have a clinical nurse trainer to support and encourage nurses to translate acquired knowledge into practical skills.

Table (1): Frequency and percentage distribution of the studied nurses according their demographic characteristics (=92)

Variables	Total Sample (n=92)	
	Number	**Percentage**
Age (Years)		
20 < 30 years	76	82.6
30 < 40 years	16	17.4
Mean±SD **Range**	26.01±3.32 22-35	
Education		
Technical Institute	75	81.5
Diploma	17	18.5
Gender		
Male	43	46.7
Female	49	53.3
Years of experience in nursing		
1 <5	66	71.7
5<10	16	17.4
≥10	10	10.9
Mean±SD **Range**	4.17±3.45 1-14	
Years of experience in critical care unit		
1 <5	71	77.2
5<10	20	21.7
≥10	1	1.1
Mean±SD **Range**	3.41±2.16 1-11	

Variables	Total Sample (n=92)	
	Mean	SD
Arrhythmias	12.94	.81
Antiarrhythmic medications	17.83	.85
Nursing role regarding antiarrhythmic medications	11.25	.68
Total Score (45questions)	42.03	1.28

Table (3): Practice mean scores of studied nurses regarding antiarrhythmic medications (n=92)

Variables	Scores	
	Mean	SD
Preparation phase		
Preparing phase for antiarrhythmic drugs given through infusion pump	4.91	.86
Administration Phase		
Administration of antiarrhythmic drugs	15.13	2.37
Post Procedure Phase		
Post administration of antiarrhythmic drugs	5.47	1.17
Total practice score (32) question	**25.53**	**2.08**

Table (4): Association between total studied nurses' knowledge and total practice

Items	Mean ± SD	r	P-value
Total knowledge	42.03 ± 1.28	0.03	.204
Total practice	25.53 ± 2.08		

r is Pearson correlation test, p value < 0.05.

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