Nurses' Performance Regarding Life Threatening Ventricular Dysrhythmias among Critically Ill Patients

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Abstract

Background: Ventricular dysrhythmias (VD) are the important cause of cardiovascular morbidity and mortality, particularly in those with structural heart disease. It is fundamental importance for nurses to recognize normal and pathological electrocardiographic tracings and allowing the adoption of appropriate and immediate interventions. **Aim of the study:** was to assess nurses' performance regarding life threatening ventricular dysrhythmia among critically ill patients in intensive care units at Zagazig University Hospitals. **Subjects and Methods: Research design:** A descriptive design was utilized to achieve the aim of this study and to answer the research questions. **Setting:** The study was conducted at all cardiac Intensive Care Units at Zagazig University Hospitals. **Subjects**: A convenient sample of 50 nurses was included in this study. **Tools of data collection:** Two tools were used; Questionnaire and observational checklists regarding life threatening VD. Data were collected over a period of six months started from July 2018 to December 2018. **Results:** The results of the study revealed that the majority of the studied nurses their age ranged from 20-29 years old and was female, near to half of nurse's graduated from bachelor nursing, and two third of nurses had years of experience in ICU more than 2 years. The present study clarified that three quarter of the studied nurses had unsatisfactory knowledge and more than half of them had unsatisfactory practice regarding life threatening ventricular dysrhythmias. **Conclusion**: Based on the results can be concluded that the studied nurses had unsatisfactory level of knowledge and practice regarding life threatening VD and need to be improved. Also, there was no significant relation between total knowledge score and total practice score**. Recommendations:** the study is recommended to there is a need to In–service training programs for the purpose of updating the knowledge and skills of nurses working with intensive care units for early identification and management of life threatening dysrhythmias and Periodic evaluation of nurses' knowledge and practice.

Key words: Ventricular Dysrhythmias, Life Threatening, Electrocardiographic, Critically Ill Patients, Nurses Performance.

Introduction

Cardiac dysrhythmias will be the results of a primary cardiac disorder, a response to a systemic condition, or the result of an electrolyte imbalance or drug toxicity, the severity of a dysrhythmia counting on its hemodynamic impact on the cardiac output, varies based on the cause of dysrhythmia and also the myocardium's ability to adapt **[Scully, 2014].**

Life-threatening dysrhythmia became defined as any Ventricular Dysrhythmia (VD) that resulted syncope/close to syncope, palpitation, dyspnea, chest ache, dizziness, orthopnea or hypotension and required

clinical intervention[**Dao, Hollander, Rosethal & Dubin, 2013].**

Ventricular dysrhythmia may be a disturbance within the traditional rhythm of the electrical activity of the heart that arises in the ventricles. It includes Premature Ventricular Contractions (PVCs), which could have one focus or can arise from multiple foci; Ventricular Tachycardia (VT), which might cause fibrillation or unexpected cardiac death; Ventricular Fibrillation (VF), that ends in death if not treated immediately; and ventricular a systole (cardiac standstill), in which no cardiac output happens and full cardiopulmonary arrest results **[Sommers & Fannin, 2015].**

According to the world health organization dysrhythmias are the most common complications that lead to death worldwide, it was exacts a significant mortality with approximately 70,000 to 90,000 sudden cardiac deaths related to dysrhythmias especially VT and VF **[Youssef, 2017]**, when either dysrhythmias occur, the heart cannot pump enough blood throughout the body. Unless treatment is delivered inside some minutes, death is eminent. Long-run treatment options for people who survive life-threatening ventricular rhythms embrace medication, surgery, implantable cardioverter electronic device or a mixture of treatments **[Shenasa, Link & Maron, 2015].**

Effective management of life threatening VD depends on rapid diagnosis and activates intervention, frequently requiring a multimodality technique, which may consist of simultaneous correction of electrolytes and pH, pharmacological measures for rate control, pressors, precise antiarrhythmic medicinal drugs, electrical pacing, or cardioversion. Intervention must be cautiously tailored to the affected person's particular dysrhythmia, its underlying cause,

and the patient's own coexisting medical and surgical condition **[Salim, et al., 2018].**

The care of severely ill patients can be very challenging due to altered ventricular filling, negative myocardial perfusion, unusual cardiac rhythm, and sever valvular lesions all contribute to a complex interaction. For that reason there is a need for interventions and several approaches that can stabilize and help in remedy of cardiac patient. Furthermore, critically ill patients require continuous evaluation of their cardiovascular system to diagnose and manage their complicated medical conditions **[Rushdy, Morsy & Elfeky, 2015].**

The role of critical care nurse in dysrhythmias management specializes in symptomatic relief, promotion of comfort and taking emergency actions in fatal dysrhythmias which include assessment of disturbed rhythm, obtaining 12- lead ECG to identify the type of dysrhythmia, and turning in adequate oxygen to reduce heart workload. As well, while administering medication as prescribed, the nurse should monitor the possible adverse drug reactions and be performing aimed nursing interventions. In cases such as VF and cardiac arrest, the nurse should perform rapid and safe defibrillation and other cardiac life support protocols to maintain oxygen supply to vital organs **[Urden, Stacy & Lough, 2020].**

Significance of the study

More than 70% of intensive care unit patients experience heart rhythm disturbances, and these patients have correspondingly higher mortality rates especially with ventricular dysrhythmias **[Uvelin, Pejakovic & Mijatovic, 2017].** Also **Ali, et al., [2015]** illustrated that, sudden cardiac death (SCD) is the cause of up to 450, 000 deaths around the world each year. SCD is usually caused by an unstable, fast ventricular rhythm, predominantly

ventricular tachycardia and ventricular fibrillation**.**

Considering that nurses are the care team professionals who continuously stay at the side of the patient, it is of fundamental importance that they be able to recognize normal and pathological electrocardiographic tracings. This competence will provide them with subsidies for the interpretation of electrocardiographic and clinical alterations that patients under their care may present, allowing the adoption of appropriate and immediate interventions [Blakeman, Sarsfield & Booker, 2015].

Aim of the study:

The current study aimed to assess nurses' performance regarding life threatening ventricular dysrhythmia among critically ill patients in intensive care units at Zagazig University Hospital.

Methodology

Research questions:

1.What is the level of nurses' knowledge regarding life threatening ventricular dysrhythmias?

2.What is the level of nurses' practice regarding life threatening ventricular dysrhythmias?

Design:

A descriptive design was utilized to achieve the aim of this study and to answer the research question.

Setting:

The present study was conducted in three cardiac Intensive Care Units at Zagazig University Hospitals; one is located in the

third floor of the heart and chest, Sednawy Hospital. and other in the fourth floor in the same building, There is also one in the ground floor of General Medical Hospital, each one consists of 10 beds, one ventilator and one monitor for each bed.

Sample:

A convenient sample of 50 nurses working in cardiac intensive care units at zagazig university hospitals.

Tools of Data Collection: Two Tools Were Used to Collect the Necessary Data as Follows

Tool I- Self- administered questionnaire was written in a simple Arabic language to avoid misunderstanding. It was designed by the researcher after reviewing of related literature **[Caon, 2018; Lader, 2013 and Heidbuchel, Duytschaever & Burri, 2017]** to assess nurses' knowledge regarding life threatening ventricular dysrhythmias among critically ill patients. This questionnaire sheet includes (98) questions, divided into two parts:-

Part I: Demographic characteristics of nurses': which were composed of 7 closed ended questions including nurse's age, gender, marital status, academic qualification, years of work since graduation, years of experience in intensive care unit and attendance training courses.

Part II: - **Nurses knowledge questionnaire** to assess nurses' knowledge regarding ventricular dysrhythmias**.** It composed of 91items. These items were classified into eight parts.

➢ **scoring system:**

Scoring system for the knowledge items, the correct answer was scored 1 and the incorrect zero. For each area of

knowledge, the scores of the items were summed- up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into percent scores. Knowledge was considered satisfactory if the percent score was equal or above 80% and unsatisfactory if less than 80% based on statistical analysis and importance of nurses' knowledge regarding critically ill patients with life threatening disorder.

Tool II- An observational checklist:

To assess the nurses' practice regarding management of patient with life threatening ventricular dysrhythmias. developed by the researcher guided by [**American Heart Association, 2016; Perry, Potter& Ostendorf, 2016; Rothrock & Mcewen, 2018; Haugen& Galura, 2015; Wilkinson, Treas, Barneft & Smith, 2016; perry, Potter& Ostendorf, 2018 ; Proctor, et al., 2017 and Wiegand, 2017**] It consists of 8parts.

➢ **Scoring system:**

For observational checklist consisted of given score one for done step and score zero for the not done, the scores of the items were summed-up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into percent scores. The nurses had satisfactory level of practice when the total score equal or above 80% and unsatisfactory if it below 80% based on statistical analysis and importance of nurses' practice regarding critically ill patients with life threatening disorder.

Content validity and reliability:

The tools were revised by a panel of three experts from nursing and medical staff. Which included two professor of medical surgical nursing and one professor of cardiology from the faculty of medicine, Zagazig University who revised the tool's content for clarity, relevance, comprehensiveness, understanding, and ease for implementation? All recommended modifications were done. Reliability statistics of the study, Cronbach's Alpha was 0.87.

Field work:

After obtaining the official permissions, the investigator started to recruit the sample of nurses. Each nurse was met individually, got a full explanation about the aim of the study and was invited to participate. The nurse who gave his/her verbal informed consent to participate was handed the self-administered questionnaire and was instructed during the filling.

Data collection took a period of six months from July, 2018 to December, 2018. The data were collected two days a week (Saturday &Sunday) from 9:00 am to 2:00 pm, the time used for finishing the self-administered questionnaire ranged between 20-30 minutes for each nurse according to nurses' physical and mental readiness and for nurses practice, Also the researcher was observing nurses' practical skills about studied procedures. The time needed to complete the checklist varies ranged between 30- 45 minutes.

Pilot study:

A pilot study was conducted on five nurses selected to check and ensure the clarity, applicability, relevance and feasibility of the tools. They are selected at random from cardiac intensive care units. Those nurses were included in the study because of no modifications in the tool.

Administrative design:

An official permission for data collection in Zagazig University Hospitals was obtained from the hospital administrative personnel by the submission of a formal letter from the Dean of the faculty of Nursing Zagazig University explaining the aim of the study in order to obtain permission and help.

Ethical consideration:

At the interview, each nurse was informed about the aim, objectives of the study, and they were informed that their participation is voluntary and they have right to withdraw from the study at any time without given any reason. In addition, confidentiality, and anonymity of the nurses were assured through coding of all data. The researcher assured that the data collected will be confidential and would be used only to improve their knowledge and practice for the purpose of the study.

Statistical analysis:

After the collection of data, it was revised, coded and fed to statistical software SPSS version 20. Data entry and statistical analysis were done using SPSS 20.0 statistical software package. Quality control was done at the stages of coding and data entry. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables and means and standard deviations and medians for quantitative variables.

Qualitative categorical variables were compared using chi-square test. Whenever the expected values in one or more of the cells in a 2x2 tables was less than 5, Fisher exact test was used instead. Spearman rank correlation was used for assessment of the inter-relationships among quantitative variables and ranked ones. In order to identify the independent predictors of the knowledge and practice score, multiple linear regression analysis was used and analysis of variance for the full regression models was done. Statistical significance was considered at p-value <0.05.

Results:

Figure(1): Total Knowledge of life threatening ventricular dysrhythmia (n=50).
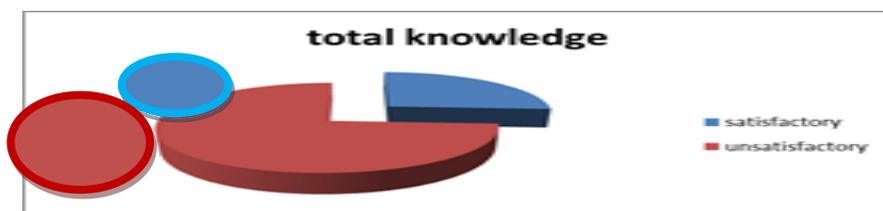
Figure (1): shows that 7% of the studied nurse has unsatisfactory knowledge regarding life threatening ventricular dysrhythmias

Figure (2): Total Practice regarding management of patient with life threatening ventricular dysrhythmias (n=50).
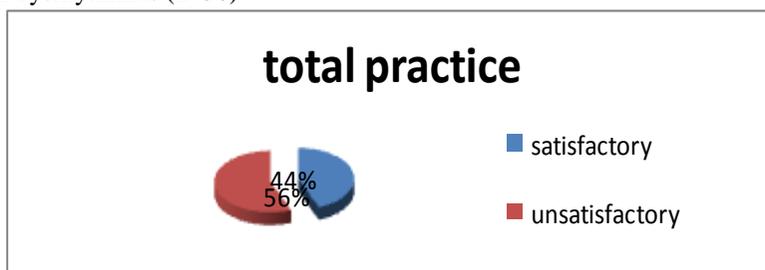

Figure (2): shows that 56% of the studied nurses had unsatisfactory Practice regarding management of patient with life threatening ventricular dysrhythmias

Table (1): shows sociodemographic characteristics of the studied nurses, which clarifies 80.0% of the studied nurses' age ranged between 20-<30 years old with median 26.5 years and 84.0% of them were female. In addition 70.0% of the studied nurses were married. As regard education level 44.0% of the studied nurses were highly educated graduated from bachelor of nursing. Furthermore 54.0% of the studied nurses had total years of experience in the hospital less than 5 years with Mean±SD 6.92±5.7, but 64.0% had more than 2 year of experience in the ICU with Mean±SD 4.34±3.4. Meanwhile 88.0% of the studied nurses had previously attended training in ICU and CCU.

Table (1): Demographic Characteristics of the studied nurses (n=50)

Demographic Characteristics	No	%
Age:		
20 – <30	40	80.0
≥ 30	10	20.0
Range	20-40	
Mean±SD	27.16±4.4	
Median	26.5	
Gender:		
Male	8	16.0
Female	42	84.0
Marital status:		
Single	15	30.0
Married	35	70.0
Nursing qualification:		
Diploma	9	18.0
Diploma + specialty	19	38.0
Bachelor	22	44.0
Experience years (total):		
<5	27	54.0
5+	23	46.0
Range	1-21	
Mean±SD	6.92±5.7	
Median	3.0	
Experience years (ICU):		
<2	18	36.0
2+	32	64.0
Range	1-18	
Mean±SD	4.34±3.4	
Median	3.0	
Attended training in ICU, CCU:		
Yes	44	88.0
No	6	12.0

Figure (3): Distribution of nurses' knowledge regarding life threatening ventricular dysrhythmias (n=50).
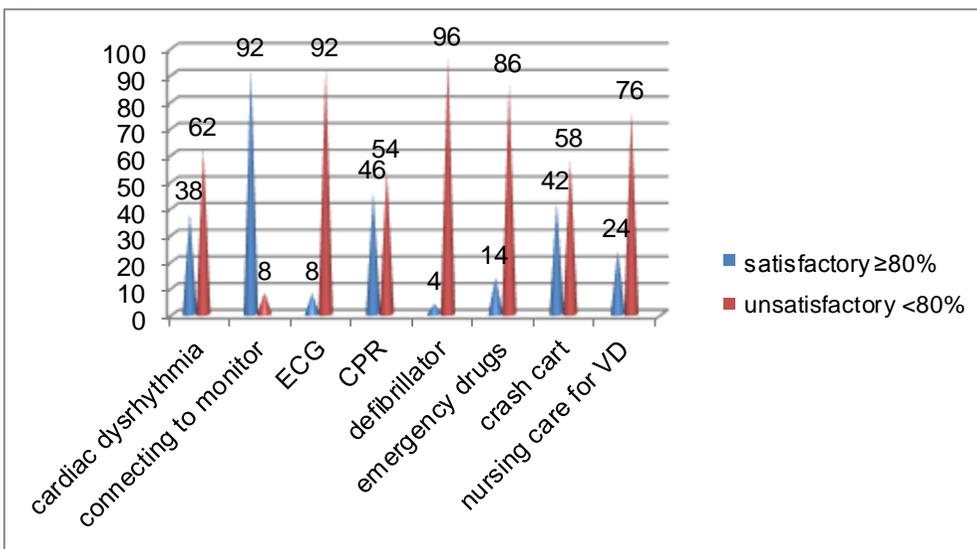

Figure (3): shows that, 92.0% of studied nurses had satisfactory knowledge regarding connecting patient to monitor. Also the studied nurses had unsatisfactory level of knowledge regarding cardiac dysrhythmias, ECG, emergency drugs, cardiopulmonary resuscitation, defibrillator, preparing crash cart, Nursing care for ventricular dysrhythmia respectively (62.0%, 92.0%, 86.0%, 54.0%, 96.0%, 58.0%, 76.0%).

Figure (4): Distribution of nurses Practice regarding management of patient with life threatening ventricular dysrhythmias (n=50).
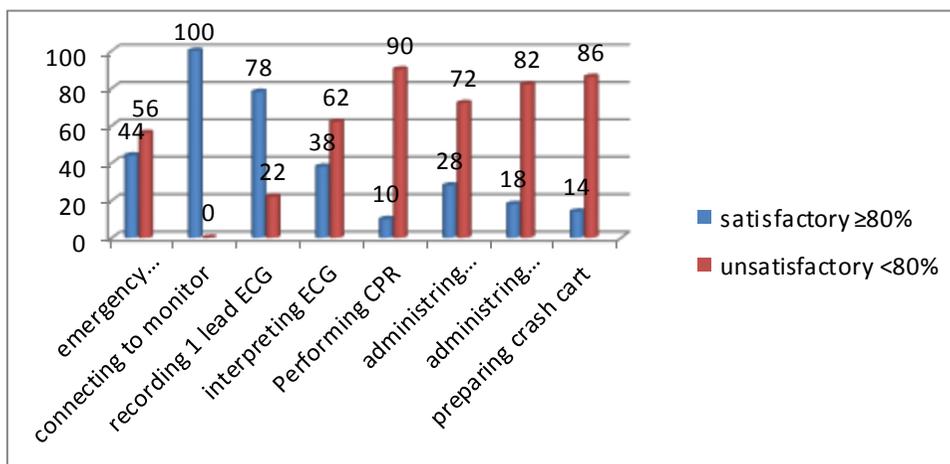

Figure (4): Clarifies that, 90.0% of the studied nurses had unsatisfactory practice regarding CPR. Meanwhile 100.0% had satisfactory practice regarding connecting the patient to the monitor.

Table (2): Relations between Demographic Characteristics of the studied nurses and their Knowledge regarding life threatening ventricular dysrhythmias.

Items	Knowledge				X^2test	p-value
	Satisfactory		Unsatisfactory			
	No.	%	No.	%		
Age:						
20 – <30	12	92.3%	28	75.7%	1.66	0.19
≥ 30	1	7.7%	9	24.3%		
Gender:						
Male	4	30.8%	4	10.8%	2.85	0.091
Female	9	69.2%	33	89.2%		
Marital status:						
Single	5	38.5%	10	27.0%	0.59	0.43
Married	8	61.5%	27	73.0%		
Nursing qualification:						
Diploma	0	0.0%	9	24.3%	16.72	0.00**
Diploma+speciality	1	7.7%	18	48.6%		
Bachelor	12	92.3%	10	27.0%		
Experience years (total):						
<5	9	69.2%	18	48.6%	1.64	0.2
5+	4	30.8%	19	51.4%		
Experience years (ICU):						
<2	0	0.0%	18	48.6%	9.88	0.002*
2+	13	100.0%	19	51.4%		
Attended training in ICU, CCU:						
Yes	12	92.3%	32	86.5%	0.46	0.79
No	1	7.7%	5	13.5%		
Total	13	100.0%	37	100.0%		

(*) Statistically significant at p≤0.05   (**) statistically high significant at P≤0.001

Table (2): Illustrates that; there was a statistical significant relation between nursing qualification and level of knowledge with P-Value at 0.00. Also, there was a statistical significant relation between years of experience in ICU and level of knowledge with P-Value at 0.002.

Table (3): Relations between Demographic Characteristics of the studied nurses and their practice regarding management of life threatening ventricular dysrhythmias.

Items	Practice				X^2 test	p-value
	Unsatisfactory		Satisfactory			
	No.	%	No.	%		
Age:						
20 – <30	22	78.6%	18	81.8%	0.08	0.77
≥ 30	6	21.4%	4	18.2%		
Gender:						
Male	6	21.4%	2	9.1%	1.39	0.23
Female	22	78.6%	20	90.9%		
Marital status:						
Single	9	32.1%	6	27.3%	0.139	0.7
Married	19	67.9%	16	72.7%		
Nursing qualification:						
Diploma	6	21.4%	3	13.6%	0.52	0.77
Diploma+speciality	10	35.7%	9	40.9%		
Bachelor	12	42.9%	10	45.5%		
Experience years (total):						
<5	13	46.4%	14	63.6%	1.46	0.22
5+	15	53.6%	8	36.4%		
Experience years (ICU):						
<2	12	42.9%	6	27.3%	1.29	0.25
2+	16	57.1%	16	72.7%		
Attended training in ICU, CCU:					2.25	0.32
Yes	26	92.8%	18	81.8%		
No	2	7.1%	4	18.2%		
Total	28	100.0%	22	100.0%		

(*) Statistically significant at p≤0.05

Table (3): Illustrates that; there was no statistically significant relation between nurses' practice of management of life threatening ventricular dysrhythmias and demographic characteristics.

Table (4): Relations between Nurses' Practice and total Knowledge regarding management of life threatening ventricular dysrhythmias

Practice	Knowledge				X^2 test	P value
	Satisfactory		Unsatisfactory			
	No.	%	No.	%		
Emergency management of life threating ventricular dysrhythmias						
Unsatisfactory	4	30.8%	24	64.9%	4.53	0.03*
Satisfactory	9	69.2%	13	35.1%		
Connecting patient to cardiac monitor						
Unsatisfactory	0	0.0%	0	0.0%	------	------
Satisfactory	13	100.0%	37	100.0%		
Recording12–lead electrocardiogram						
Unsatisfactory	1	7.7%	10	27.0%	2.09	0.14
Satisfactory	12	92.3%	27	73.0%		
Interpreting 12- lead electrocardiogram						
Unsatisfactory	6	46.2%	25	67.6%	1.87	0.17
Satisfactory	7	53.8%	12	32.4%		
Performing cardiopulmonary resuscitation						
Unsatisfactory	12	92.3%	33	89.2%	0.104	0.74
Satisfactory	1	7.7%	4	10.8%		
Administering automated external defibrillation						
Unsatisfactory	12	92.3%	24	64.9%	3.59	0.058
Satisfactory	1	7.7%	13	35.1%		
Administering emergency medications						
Unsatisfactory	12	92.3%	29	78.4%	1.26	0.26
Satisfactory	1	7.7%	8	21.6%		
Crash cart preparation						
Unsatisfactory	12	92.3%	31	83.8%	0.58	0.44
Satisfactory	1	7.7%	6	16.2%		

(*) Statistically significant at p≤0.05

Table (4): reveals that, there was a statistical significant relation between nurses' practice and their total knowledge in emergency management of life threating ventricular dysrhythmias with p-value at 0.03.

Table (5): Coefficient correlation between nurses' knowledge and practice and demographic characteristics.

Factors		Spearman's rank correlation coefficient	
		Knowledge	**Practice**
Age	R	-0.044-	0.088
	P	0.760	0.545
	No	50	50
Experience (total)	R	.385**	0.274*
	P	.008	0.028
	No	50	50
Experience (ICU& CCU)	R	0.355*	0.174
	P	0.012	0.226
	No	50	50
Total practice	R	0.145	1
	P	0.314	
	No	50	50

(*) Statistically significant at p≤0.05   (**) statistically high significant at P≤0.001

Table (5): there was a positive correlation was detected between total years of experience of the studied nurses' and knowledge scores (r=**.385**). In addition there was statistically significant positive correlation between total years of experience of the studied nurses' and practice scores (r=**0.274**). On the other hand, there was a positive correlation between years of experience in ICU&CCU and knowledge scores (r=**0.355**).

Discussion:

Disorders that are potentially life-threatening require expert clinical judgement and vigilance on the part of the nurse, patients with dysrhythmias that disrupt their activities of daily living or are potentially lethal are often anxious and need nurse, who understand how the dysrhythmia affects their quality of life . Caring practices are considered the soul of nursing care, identifying patients at high risk for developing lethal dysrhythmias is the first step in providing excellent care. In hospital, the care the patient receives, armed with nurses knowledge of medical and nursing language, biochemistry, human anatomy and physiology **(Peate &Wild, 2018).**

The results of the current study revealed that the majority of the studied nurses their age between 20-29 years old and were female. More than two thirds of them were married. In addition near to half of them highly educated graduated from bachelor of nursing, and more than half of the studied nurses had years of experience in hospital less than 5 years with mean 6.92±5.7, but about two third of them had years of experience in the ICU more than 2 year. A female gender was higher than male due to the most of nurses in the past were female. As well as near to half of them was highly educated because of the ICU is critical area that needs more qualified nurses.

Finding of this study clarified that the majority of studied nurses had previously attended training course in ICU and CCU. This might be due to availability of training courses by the university, These findings in the same line with **Mousa, (2015)** in which roughly two thirds of the studied nurses had training session. This contradicted with **Yadav & Mehta, (2018)** who reported that the majority of the studied nurses hadn't

previously taken the life support training courses.

The current study clarified that about three quarters of nurses had unsatisfactory knowledge regarding Life Threatening Ventricular Dysrhythmias (LTVD). This obligation of nurses' knowledge at this critical area might be as a result of lack of refreshment of the nurses' knowledge. Moreover, the nurses in Egypt are not used the independent self-learning. Another cause for lack of knowledge is nurses' exhaustion due to increased work load which may hinder their ability to read and update their knowledge. In the same consequence with **Mousa, et al., (2016)** who reported that more than two third of nurses, their knowledge regarding ventricular dysrhythmias was unsatisfactory. This is contraindicated with **Rajput, (2016)** who reported that near to half of staff nurses were have very good knowledge regarding identification and management of cardiac dysrhythmias.

The present study reported that more than half of the studied nurses had unsatisfactory practice regarding life threatening ventricular dysrhythmias. This could be attributed to lack of nurses' knowledge, which reflects on their practice, inadequate continuous training program and sometimes-insufficient equipment. This agrees with **Ruhwanya, Tarimo & Ndile, (2018)** who reported that the studied nurses had poor skills regarding life threatening arrhythmias.

Relation's analysis showed that there was a statistical significant relationship between total nurses' knowledge of LTVD and nursing qualification. This could be attributed to that the majority of the studied nurses were bachelor nursing. This findings in the same line with **Ruhwanya, Tarimo & Ndile, (2018)** who reported that an association was found between the nurses' level of knowledge and educational qualifications, as well as between having a high level of knowledge and having attending Advanced Cardiac Life Support training . This result in contrary with **Al-**

Husaunawy, (2015) who demonstrated that there was no significant association between nurses knowledge and their demographic characteristics.

Also the present study had found a statistically significant association between studied nurse's knowledge scores and years of experience in ICU as increase years of experience in ICU promote nurses' knowledge as a result of increased number of follow up of cases and dealing with them. This finding is supported by **Sheilini & Devi, (2014)** who reported that those years of experience at clinical practice had impact on nurses' knowledge, skills, and experience.

The result of the present study showed that there was no statistical significant relation between nurse's practice regarding management of patient with LTVD and their demographic characteristics. This may be related to increased years of experience assign supervision role to nurses that exclude them from clinical work and low quality training to whom they received. This finding disagrees with **Taha, (2017),** who revealed that there was a relationship between nurse's practice before the study intervention and their socio-demographic characteristics.

Finding of the current study revealed that there was positive correlation coefficient between total experience of nurses' and knowledge scores and there was positive correlation coefficient between nurses' experience in ICU and knowledge scores. This could be as increase knowledge with experience. On the other hand, there was a positive correlation coefficient between total experience and their practice scores. Our finding is supported with **Manzari, Bazzi & Sharafi, (2018)** who reported that there was a positive significant correlation between work experience and performance.

On the other hand, this finding contradicted with **Yaqoob & Nasaif, (2015)** who reported that there was no significant statistical difference in the mean score of knowledge in relation to years of experience.

Conclusion:

The results of the present study concluded that three quarter of the studied nurses had unsatisfactory total knowledge and more than half had unsatisfactory practice regarding LTVD. In addition, there was a statistical significant relation between nursing qualification and satisfactory level of knowledge, while there was no statistically significant relation between nurses' practice and demographic characteristics. Also, there was no statistically significant relation between nurses total knowledge score and total practice score.

Recommendations:

Based on findings, the study recommended:

- In-service training programs for updating the knowledge and skills of nurses working in ICU for early identification and management of life threatening dysrhythmias.

- Periodic evaluation of nurses' knowledge and practice regarding life threatening dysrhythmias management.

- Educational posters in the critical care units include an outline concerning early interventions or treatment for this disorder may be more beneficial for nurses.

- A further study is necessary to identify effects of educational program on nurse's knowledge and practice regarding life threatening dysrhythmias.

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