

## Assessment of Nurses' Knowledge and Practices Regarding Care For Patients with Cardiogenic Shock

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### Abstract

Cardiogenic shock is a clinical syndrome characterized by end organ hypo perfusion. It's an irreversible condition may lead to cardiac arrest. Critical care nurses possess pivotal role in the assessment of patient with cardiac shock, providing treatment. **Aim of the study:** This study aimed to assess nurses' knowledge and practice regarding caring of patient with cardiogenic shock. **Setting:** the study was conducted in coronary care unit at Heart hospital Assiut University. **Study design:** A descriptive research design was utilized in the study. Subjects The study included 40 nurses working in the mentioned setting. **Tools:** two tools were used for data collection, Tool one: nurses' knowledge assessment tool. Tool two: observational checklist regarding caring of cardiogenic shock patients **Results:** revealed that total knowledge level of nurses were (72.5%) unsatisfactory level regarding care of cardiogenic shock patients and (27.5%) of nurses had a satisfactory level. While total nurses practice level were (82.5%) had an inadequate level regarding care for patient with cardiogenic shock and (17.5%) had an adequate level. **Conclusion:** Nurses showed inadequacy of their knowledge and practices regarding care of cardiogenic shock patients. **Recommendations:** The study recommends that an education program regarding care of cardiogenic shock patients be designed, conducted and monitored for nurses working in the ICU.

**Keywords:** *Cardiogenic Shock, Nurse`s Knowledge & Practices.*

### Introduction

Cardiogenic shock (CS) is a state of critical end-organ hypoperfusion primarily due to cardiac dysfunction. Cardiogenic shock is a clinical condition of inadequate tissue perfusion because of cardiac dysfunction and occurs when either systolic or diastolic dysfunction of the heart's pumping action results in decreased cardiac output ( **Pepe, et al., 2019**).

Cardiogenic shock is the second most common cause of circulatory shock, that occurs secondary to myocardial infarction and it accounts for 80% of the cases, and remains one of the leading causes of death in patients with acute myocardial infarction. Cardiogenic shock carries a high morbidity and mortality despite recent advances in medical and mechanical therapies. Cardiogenic shock also occurs in non-acute coronary syndrome conditions, such as cardiomyopathy, fulminant myocarditis, end stage heart failure, and others ( **Hritani, et al., 2017**).

Cardiogenic shock may be caused by different, valvular heart disease and arrhythmias with heterogeneous treatment targets ( **Van Diepen, et**

**al., 2017**) Morbidity and mortality complications of cardiogenic shock may include the following: cardiopulmonary arrest, dysrhythmia, renal failure, multisystem organ failure, ventricular aneurysm, thromboembolic sequelae, stroke and death ( **Garan, et al., 2018**).

Diagnostic criteria of cardiogenic shock include hypotension (systolic blood pressure <90 mmhg, over vasopressors required to achieve blood pressure ≥90 mmhg) and signs of impaired tissue perfusion(e.g central nervous system abnormalities including confusion or lack of alertness, even loss of consciousness, oliguria, cold clammy skin and extremities in the state of normovolemia or hypervolemia ( **Tehrani, et al., 2019**).

Nursing priorities for cardiogenic shock are directed toward: decreasing myocardial oxygen demand, enhancing myocardial oxygen supply, maintaining adequate tissue perfusion, providing comfort and emotional support, Preventing and maintaining surveillance for complications ( **Carlson & Fitzsimmons 2019**).

Effective therapy for shock must also include a prevention strategy. This requires identification of

patients at high risk for shock development and selection of patients who are candidates for aggressive intervention. The critical care nurse must carefully assess the patient, observe the cardiac rhythm, monitor hemodynamic parameters, and record fluid intake and urinary output. The patient must be closely assessed for responses to the medical interventions and for the development of complications, which must be corrected immediately. The nurse providing care to the patient with shock or at risk of shock must understand the underlying mechanisms of shock and recognize its subtle as well as more obvious signs. Rapid assessment and rapid response are essentially to recovery (Hussein & Hassan, 2016). The nurse plays an effective and great role in different types of care for the patients. there is no doubt that the nurse who works in the coronary care unit and emergency department must be intelligent enough and qualified for these tasks in addition to his general duties, therefore, he must have a good scientific back ground about the profession and details related to coronary artery disease and critical care in order to identify patients problems and to which make the proper decision for intervention (Taib, et al., 2018).

Critical care nurses possess pivotal role in the assessment of patient with cardiac shock, providing evidence based treatment strategies and evaluating therapies administered. Integral to nursing care is the evaluation of cardiovascular and respiratory assessment. Findings from this assessment may identify patients who are at risk for developing cardiogenic shock. Clue to impending shock include higher heart rate and low blood pressure on admission. For those with a diagnosis of cardiogenic shock, a cardiovascular and respiratory assessment provides information on end organ perfusion and function, and serves as a guide when evaluating effect of therapies administrated (O'Donovan, 2019).

### Significance of the study

Cardiogenic shock carries a high morbidity and mortality despite recent advances in medical and mechanical therapies. Cardiogenic shock occurs due to end stage heart failure. The nurses have an important and effective role in caring of cardiogenic shock patient require advanced nursing care and extensive training. The record of hospital admission for patients with cardiogenic shock in

coronary care unit at heart hospital, Assiut University through (2018) were 4000 cases. So this study aimed at assessing nurses' knowledge and practices regarding care for patients with cardiogenic shock.

**Aim of this study** to assess of nurses' knowledge and practices regarding care for patients with cardiogenic shock.

### Research Questions

What are the level of nurse's knowledge regarding cardiogenic shock patient's care?

What are the level of nurse's practices regarding cardiogenic shock patient's care?

### Subjects & Methods

#### Research design

A descriptive research design was utilized in this study.

#### Setting

The study was conducted in coronary care unit at a Heart hospital, Assiut University.

### Subjects & Population

All available nurses were selected in the study the sample of this study was consisted of 40 nurses.

#### Study tools

Two tools were used in this study:

**Tool (1): Nurses' knowledge questionnaire:-** This tool consists of structured true or false, multiple – choice assessment tool. This tool was developed by the researcher after reviewing literature, to assess the knowledge level of the critical care nurse regarding the care of cardiogenic shock patient (Urden, et al., 2019).

#### This tool included two parts

- **Part (1):** Nurse's demographic data such as age, sex, marital status, level of education, years of experience and previous training course.
- **Part (2):** Nurse's knowledge as general information regarding cardiogenic shock as definition, causes, signs and symptoms, risk factor, and complications and nursing care of patient with cardiogenic shock including (mechanical ventilator, intra-aortic balloon pump, medications and cardiac arrhythmias related to cardiogenic shock...ect)

**Scoring system for knowledge:** Each correct answers is given one (1) score tand an incorrect answer given zero (0).the number of questions is

11. The total scores of nurse's knowledge was calculated and classified as follows:

- Less than 60% was regarded as an unsatisfactory level of knowledge.
- Equal or above 60% was regarded as a satisfactory level of knowledge (Hussein & Hassan, 2016)

#### **Tool (II): Nurse's practice observation checklist**

The observation checklist was developed to assess the practical aspect of the basic nurse's procedure about care of patients with cardiogenic shock and covered all steps (8) of all procedures:- (Administer oxygen, administrate intravenous line, prepare patient for intubation and mechanical ventilation, monitoring of blood pressure, administer vasopressors and positive inotropes, monitor arterial blood gas levels and prepare to treatment of imbalances, monitor distal pulses and monitor urinary output).

**Scoring system for nurse's practice:** Each item was observed, categorized and scored as follow:-

1. Two for each step that done correctly (principles, in time and with the required frequency) a total of 3.
2. One for each step done incorrect (incorrectly, not in time and without the required frequency).
3. Zero for step that not done.

**The total score** of nurse's practice was calculated and classified as follows:-

- Less than 60% was regarded as an inadequate level of nurse's practice.
- Equal or above 60% was regarded as an adequate level of nurse's practice. (Hussein, 2016).

## **Methods**

### **Preparatory phase and administrative design**

This phase involved:

- An official approval was obtained from the Dean of Faculty to the head of the cardiology Hospital, to carry out this study and explained the purpose of the study, and asking for permission to conduct it.
- **Validity of the tool:** The tools will be developed by the researcher after reviewing the related literature and revised by 7 specialist in the nursing field to test content validity, clarity, feasibility and the necessary modification will be done.

### **Pilot Study**

After development of the necessary tool a Pilot study including 10% of nurses (4 nurses) was

carried out to ensure clarity and applicability of the developed tool, and to estimate the time required to fill the questionnaire. Based on the results of the pilot study, the necessary modifications were done nurses included in the pilot study were excluded from the study sample.

**Reliability of the tool :** Reliability of the tool was assessed using alpha test to test the internal consistency knowledge = 0.788

### **Ethical consideration**

- Research proposal is approved from Faculty Ethical committee.
- There is no risk for study subject during application of the research.
- The study follows common ethical principles in clinical research.
- Confidentiality and anonymity is assured.
- Study subject have the right to refuse to participate and or withdraw from the study without rational any time.
- Study subject privacy is considered during collection of data.
- Agree to participant in this study (oral agreement).

### **Statistical analysis**

Date entry and data analysis were done using SPSS version 19 (Statistical Package for Social Science). Data were presented as number, percentage, mean, standard deviation. Chi-square test and Fisher Exact test were used to compare qualitative variables. P-value considered statistically significant when  $P < 0.05$ .

### **Field of work:**

The researchers started to collect data from the first of January 2018 until the end of March 2019. The researchers collect data from nurses who work in coronary care unit at Heart Hospital.

- An interview form was designed by researcher who visited the selected setting and requested from nurses to participate in the study through face-to-face interviews
- The questionnaire was adopted by the researcher in Arabic format in order to suit the studied nurses' language and their level understanding.
- The researcher had made an interview and asked nurses individually to fill out structured questionnaire at break time to identify nurses' knowledge and practices about cardiogenic shock in coronary care unit.

- The researcher had met one or two nurses each time to fill out the questionnaire at morning shift and each interview had taken half hour.
- The interview was conducted in coronary care unit at Heart hospital Assiut University.
- The nurses were assessed their knowledge about cardiogenic shock in coronary care unit.
- The nurses were assessed their practices cardiogenic shock in coronary care unit.

## Results

Table (1): distribution of Socio demographic data For Study Sample (No=40).

	No.	%
<b>Age group</b>		
From 21-25 years	14	35.0
from 25-30 years	23	57.5
More than 30 years	3	7.5
<b>Mean±SD(range)</b>	<b>26.30±2.73(21-33)</b>	
<b>Gender</b>		
Female	40	100.0
<b>Marital Status</b>		
Single	10	25.0
Married	29	72.5
Widow	1	2.5
<b>Education level</b>		
Nursing diploma	8	20.0
Nursing Technical institute	26	65.0
Bachelor	6	15.0
<b>Experience years</b>		
Less than 2 years	6	15.0
2- 5 years	18	45.0
More than 5 years	16	40.0
<b>Training course</b>		
Yes	27	67.5
No	13	32.5

Table (2): Distribution of Nurse's Knowledge score regarding Cardiogenic Shock (No=40)

Nurse's Knowledge score regarding Cardiogenic Shock	I		C	
	No	%	No	%
<b>Definition of Cardiogenic shock</b>	17	42.5	23	57.5
<b>Causes of cardiogenic shock are</b>	19	47.5	21	52.5
<b>Signs and symptoms of cardiogenic shock</b>	8	20.0	32	80.0
<b>Criteria of cardiogenic shock</b>	33	82.5	7	17.5
<b>Complications of cardiogenic shock are:</b>	21	52.5	19	47.5
<b>Risk factor of cardiogenic shock</b>	19	47.5	21	52.5
<b>Nursing care regarding cardiogenic shock patient</b>	26	65.0	14	35.0
<b>Medications used to treatment of cardiogenic shock</b>	5	12.5	35	87.5
<b>Nursing care regarding cardiogenic shock patient with mechanical ventilator.</b>	24	60.0	16	40.0
<b>Nursing care regarding arrhythmia related to cardiogenic shock</b>	11	27.5	29	72.5
<b>Nursing care for intra-aortic balloon pump</b>	37	92.5	3	7.5
<b>Mean ±SD (range)</b>	<b>6.5±1.6(3-11)</b>			

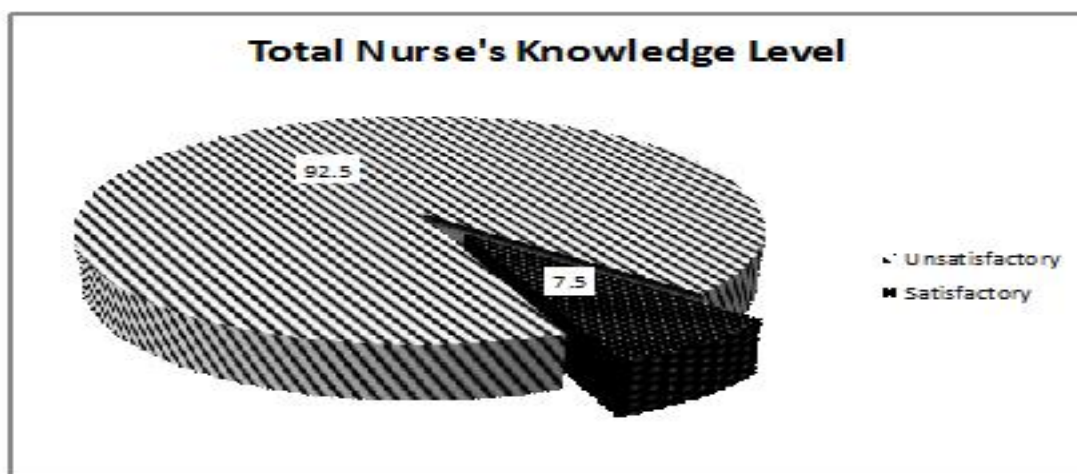


Figure (1): Distribution of total nurses' knowledge level regarding cardiogenic shock patient care.

Table (3):-Distribution of Nurses' Practice level regarding cardiogenic shock (No=40).

Nurses' Practices regarding cardiogenic shock	No	%
<b>Administer oxygen as prescribed.</b>		
Incorrect	27	67.5
Correct	13	32.5
<b>Administrate intravenous line</b>		
Incorrect	5	12.5
Correct	35	87.5
<b>Prepare patient for intubation and mechanical ventilation</b>		
Not Done	14	35
Incorrect	23	57.5
Correct	3	7.5
<b>Monitoring of blood pressure while administrate of diuretics and nitrates</b>		
Not Done	5	12.5
Incorrect	25	62.5
Correct	10	25.0
<b>Administer vasopressors and positive inotropes</b>		
Incorrect	5	12.5
Correct	35	87.5
<b>Monitor arterial blood gas levels and prepare to treatment of imbalances.</b>		
Not Done	17	42.5
Incorrect	20	50.0
Correct	3	7.5
<b>Monitor urinary output.</b>		
Not Done	2	5.0
Incorrect	19	47.5
Correct	19	47.5
<b>Monitor distal pulses</b>		
Not Done	36	90.0
Incorrect	2	5.0
Correct	2	5.0
<b>Mean <math>\pm</math>SD (range)</b>	<b>9.15<math>\pm</math>2.15(5-13)</b>	

Table (4): Distribution of total nurses' practice level regarding cardiogenic shock (No=40).

Nurses' practice level regarding cardiogenic shock	No	%
Inadequate	35	87.5
Adequate	5	12.5
Mean ±SD (range)	9.15±2.15(5-13)	

- Chi-square test, \*\* Significant difference at p. value<0.01  
 - independent t-test \*\* Significant difference at p. value<0.01

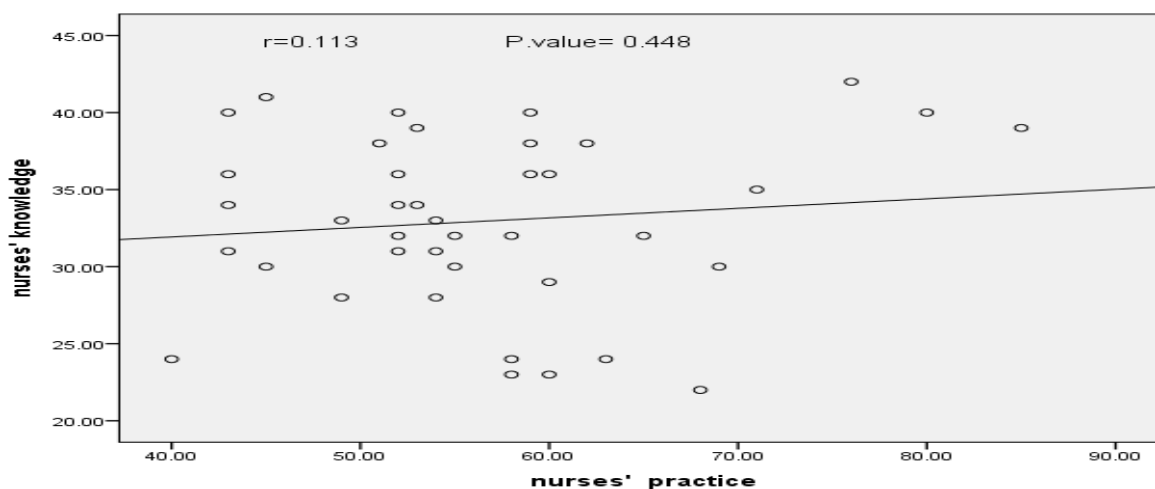


Figure (2): Correlation between total nurse's knowledge level and their total practice level regarding nursing care for patient with cardiogenic shock

Table (5): Relationship between nurses knowledge and practice with their socio demographic data

Socio Demographic data	Knowledge Level about Cardiogenic Shock					Practice Level about Cardiogenic Shock				
	Unsatisfactory		Satisfactory		P. value	Unsatisfactory		Satisfactory		P. value
	No	%	No	%		No	%	No	%	
<b>Age group</b>										
From 21-25 years	13	35.1	1	33.3	0.864	11	31.4	3	60.0	0.416
from 25-30 years	21	56.8	2	66.7		21	60.0	2	40.0	
more than 30 years	3	8.1	0	0.0		3	8.6	0	0.0	
<b>marital Status</b>										
Single	9	24.3	1	33.3	0.911	8	22.9	2	40.0	0.677
Married	27	73.0	2	66.7		26	74.3	3	60.0	
Widow	1	2.7	0	0.0		1	2.9	0	0.0	
<b>Education level</b>										
Nursing diploma	7	18.9	1	33.3	0.469	8	22.9	0	0.0	0.488
Nursing Technical institute	25	67.6	1	33.3		22	62.9	4	80.0	
Bachelor	5	13.5	1	33.3		5	14.3	1	20.0	
<b>Experience years</b>										
Less than 2 years	6	16.2	0	0.0	0.650	4	11.4	2	40.0	0.084
2- 5 years	16	43.2	2	66.7		15	42.9	3	60.0	
More than 5 years	15	40.5	1	33.3		16	45.7	0	0.0	
<b>Training courses</b>										
Yes	26	70.3	1	33.3	0.189	23	65.7	4	80.0	0.523
No	11	29.7	2	66.7		12	34.3	1	20.0	

- Chi-square test,

**Table (1):** Illustrates the distribution of nurse's knowledge according to their socio demographic characteristics; (57.5%) of nurses were aged between 25-30 years and (7.5%) above 30 years. Among the total sample (65%) of the nurses were from the nursing institute and; (20%) of the nurses held a nursing secondary school degree. Moreover, (45%) of nurses had work experience 2-5 years, and (40.0%) had more than 5 years of experience. As regarding training courses attendance it was found that (67%) had attended courses and (32.5%) hadn't.

**Table (2):** Shows that the distribution of nurse's knowledge regarding definition, causes, sign and symptoms, criteria, complications and risk factor of cardiogenic shock was (57.5%, 52.5%, 80.0%, 17.5%, 47.5%, and 52.5%) respectively among who responded correctly. As regarding nursing care (35.0%, 87.5%, 40.0%, 72.5% and 7.5%) respectively of nurses responded correctly about the care of cardiogenic shock patient, medications used to treat cardiogenic shock, mechanical ventilated patient care, cardiac arrhythmia related to cardiogenic shock and intra-aortic balloon pump nursing care respectively

**Figure (1):** Shows total nurses' knowledge level regarding cardiogenic shock. It was found that (92.5%) of nurses had unsatisfactory level of knowledge regarding cardiogenic shock patient care and (7.5%) of nurses had a satisfactory level of knowledge.

**Table (3):** Revealed the distribution of nurses' practice score regarding cardiogenic shock. It was found that (32.5%) of nurses administrate oxygen, (87.5%) of nurses establish intravenous line, (7.5%) prepare patient for intubation (25%) monitor blood pressure, (87.5%) administer positive inotropes, (7.5%) monitor atrial blood gases, (47.5%) monitor urine output and (5.0%) monitor distal pulse correctly.

**Table (4):** show the total nurses' practice level regarding cardiogenic shock. It was found that (87.5%) of nurses had an inadequate level of practice regarding cardiogenic shock patient care and (12.5%) of nurses had an adequate level of practice.

**Figure (2):** shows that; there was no correlation between total nurse's knowledge score and their total practice score regarding care for patient with cardiogenic shock.

**Table (5):** shows the distribution between nurse's total knowledge and practice level as related to the socio demographic data. It was found that there were no statistical relationship between nurse's knowledge and their socio demographic data.

## Discussion

Cardiogenic shock is failure of the heart to pump adequately, thereby reducing cardiac output and compromising tissue perfusion. Necrosis of more than 40% of the left ventricle occurs, usually as a result of occlusion of major coronary vessels. The goal of treatment is to maintain tissue oxygenation and perfusion and improve the pumping ability of the heart (Silvestri, 2016).

Complications of cardiogenic shock may include the following cardiopulmonary arrest, dysrhythmia, renal failure, multisystem organ failure, ventricular aneurysm, thromboembolic sequelae, stroke and death (Garan, et al., 2018)

One of the primary responsibilities of the nurse in critical care unit is to prevent cardiogenic shock occurrence. Preventive measures include the identification of patient who at risk. Effective nursing management of cardiogenic shock requires precise monitoring and management of heart rate, preload, afterload and contractility. This is accomplished through accurate measurement of hemodynamic variables and controlled administration of fluids and inotropic and vasoactive agents. Close assessment and management respiratory function is also essential to maintain adequate oxygenation. Dysrhythmias are common and require immediate recognition and treatment (Urden, et al., 2019). Atrial and ventricular arrhythmias commonly arise in the setting of cardiogenic shock and often result in hemodynamic deterioration (Maury, et al., 2019). The immediate management of emergency is dependent on the prompt action is essential. Nurse represents the largest body of health care professional. A trained nurse could effectively deal with cardiovascular emergency, including rhythm recognition, early defibrillation and emergency medication administration (Kandula, et al., 2019). Therefore nurses caring for such patients should be highly vigilant for early symptoms comments that cardiogenic shock carries a high mortality rate despite advances in treatments (Jones & Rushton, 2012).

The result is in agreement with the study done by (Al-Ganmi, 2014) who noticed in his study that the majority of ICU nursing staff were 26-30 years.

Regarding the educational level, the current study showed that more than half of the nurses had obtained the Technical Institute of Nursing diploma. which disagrees with (Hussein and Hassan, 2016) who found in his study that the majority of nurses are nursing college graduates and also disagree with (Al-Ganmi, 2014) who noticed that the highest percentages of the sample were academic nurses who graduated from Colleges of Nursing.

The current study revealed that the highest proportion of nurses was  $\leq 5$  years of experience and this result is in line with (Al-Ganmi, 2014) who noticed that the highest percentages of nurses were  $\leq 5$  years of experience. More than two reported that they have attended previous training courses and this result is in agreement with (Taib, et al., 2018). Who found in his study regarding the training sessions that most of nurses have been trained.

According to the current study result regarding nurses' knowledge level regarding cardiogenic shock, definition, causes, sign and symptoms, criteria, complications, knowledge about nursing care for cardiogenic shock patients, mechanically ventilated patient with cardiogenic shock, arrhythmias and medication nursing care were unsatisfactory. The result is in agreement with (Hussein & Hassan, 2016) who found in his study that nurse's knowledge scores were poor on all knowledge items. The current study results was in line with (Sambu, 2018) who found in his study that most of sample was unsatisfactory.

The current study result was disagree with the study conducted by (Taib, et al., 2018) who revealed in his study regarding the knowledge of nurses' about cardiogenic, nursing care for cardiogenic shock patients and information about medication were satisfactory.

The current study revealed that practice level of nurses regarding care of cardiogenic shock patients in the area of blood pressure measurement, oxygen administration and cannula insertion were unsatisfactory level of practice and this result disagreed with (Taib, et al., 2018) who found in his study that nurses were able to perform efficiently, safely, and multi-disciplinary collaboration in the care of patients with cardiogenic shock and also disagrees with (Al-Ganmi, 2014).who found in his

study that nurses have an overall high level of practice related to the nursing care of cardiogenic shock patients.

So, we can conclude that the lack of nurse's knowledge affects negatively on their practice regarding the care of patients with cardiogenic shock and their outcomes and all new nurses require training programs in coronary care unit and continuing nursing education regarding care for patient with cardiogenic shock.

### Conclusion

Based on the results of the present study, it was concluded that: nurses working in coronary care unit had unsatisfactory level of knowledge regarding care of cardiogenic shock patients. Also nurses had unsatisfactory practice levels regarding care of cardiogenic shock patients in coronary care unit.

### Recommendations

- Education program is needed for nurses regarding knowledge and practice of patient's with cardiogenic shock
- The study recommends that nurses need to be joining in special courses in order to improve their knowledge and practice.
- Periodic monitoring of nurses practices and newly nurses should train effectively.

### References

1. Al-Ganmi, A., (2014): Assessment of Nurses' Knowledge Concerning Cardiogenic Shock for Patients' in Cardiac Care Unit at Baghdad Hospitals. *kufa Journal for Nursing sciences*, 4(2), 215-222.
2. Carlson, B., & Fitzsimmons, L., (2019): Shock, sepsis, and multiple organ dysfunction syndrome. *Priorities in Critical Care Nursing-E-Book*, 474
3. Garan A., Eckhardt C., Takeda K., (2018): Predictors of survival and ability to wean from short-term mechanical circulatory support device following acute myocardial infarction complicated by cardiogenic shock. *Eur Heart J Acute Cardiovasc Care*. 2018 Dec. 7 (8):755-65. [Medline].
4. Hritani, A., Allaqaband, S., & Jan, M., (2017): Cardiogenic Shock. In *Interventional Cardiology*. IntechOpen.



5. **Hussein, A., & Hassan, H., (2016):** Effectiveness of Educational Program on Nurse's Knowledge Concerning Management of Cardiogenic Shock at AL-Mosul Teaching Hospitals. *kufa Journal for Nursing sciences*, 6(1), 154-162.
6. **Jones, I., & Rushton, M., (2012):** Circulatory shock part 2: Nursing management. *British Journal of Cardiac Nursing*, 7(12), 580-585.
7. **Kandula, M., Karthika, P., & Abraham, R., (2019):** Nurses Action towards Cardio Vascular Emergencies. *Asian Journal of Nursing Education and Research*, 9(1), 121-126.
8. **Maury, P., Mansourati, J., Fauchier, L., Waintraub, X., Boveda, S., & Sacher, F., (2019):** Management of sustained arrhythmias for patients with cardiogenic shock in intensive cardiac care units. *Archives of cardiovascular diseases*.
9. **O'Donovan, K., (2019):** Management of cardiogenic shock complicating ST-segment elevation myocardial infarction: 2. *British Journal of Cardiac Nursing*, 14(2), 80-85.
10. **Pepe, M., Santo Bortone, A., Giordano, A., Cecere, A., Burattini, O., Nestola, P., & Favale, S., (2019):** Cardiogenic Shock Following Acute Myocardial Infarction: What's New?. *Shock*.
11. **Sambu, B., (2018):** Effect of a Training Program on Nurse's, knowledge, Attitudes and Practice regarding Nursing Care of Acute Myocardial Infarction in Medani Heart Center and Wad Medani Emergency Hospital, Gezira State, Sudan (2014-2017) (Doctoral dissertation, University of Gezira).
12. **Silvestri, L., (2016):** Saunders Canadian Comprehensive Review for the NCLEX-RN. Elsevier Health Sciences.
13. **Taib, A., Mohamed, J., & AL-samady, A., (2018):** Assessment of nurses knowledge and practices concerning cardiogenic shock. *Mosul Journal of Nursing*, 6(2), 87-97.
14. **Tehrani, B., Truesdell, A., Sherwood, M., Desai, S., Tran, H., Epps, K., & Rosner, C., (2019):** Standardized team-based care for cardiogenic shock. *Journal of the American College of Cardiology*, 73(13), 1659-1669.
15. **Urden, L., Stacy, K., & Lough, M., (2019):** Priorities in Critical Care Nursing-E-Book. Elsevier Health Sciences.
16. **Van Diepen S., Katz J., Albert N., Henry T., Jacobs A., Kapur NK, Kilic A., Menon V., Ohman E., Sweitzer N., Thiele H., Washam J., (2017):** Cohen MG. Contemporary management of cardiogenic shock—a scientific statement. *Circulation* 2017;136:e232–e268.