Ministry of Higher Education

And Scientific Research

University of Babylon

College of Nursing

Assessment of Nurses' Knowledge toward Pulmonary Embolism Disease in Critical Care Units at Al-Hila Teaching hospitals

A Thesis

Submitted to the Council of the College of Nursing, University

of Babylon in Partial Fulfillment of the Requirements for the

Degree of Master of Sciences in Nursing

By

Ahmed Ali Abdul Hadi

Supervised By

Assist. Prof. Dr. Hussam Abbas Dawood

July, 2021 A.D.   Dhul Hijjah , 1443 A.H

بسمِ اللهِ الرحمنِ الرحيمِ

((قَالُواْ سُبْحَانَكَ لَا عِلمَ لَنَا إِلَّا مَا عَلَّمتَنَا إِنَّكَ أَنتَ العَلِيمُ الحَكِيمُ))

صَدقَ اللهُ العليُّ العظيمُ

سُورةُ البقرة

الآية (32)

Supervisor certificate

I certify that this thesis, entitled (**Assessment of Nurses' Knowledge toward Pulmonary Embolism Disease in Critical Care Units at Al-Hila teaching hospitals**) submitted by **Ahmed Ali Abdul Hadi** was prepared under my supervision and guidance at the Department of Adult Nursing, College of nursing, University of Babylon as a partial fulfillment of the requirement for the Degree of Master of Sciences in Nursing.

Signature

Supervisor

Dr. Hussam Abbas Dawood

College of Nursing

University of Babylon

/   /   2021

Signature

Head of Department of ....

Dr. Shatha Saadi Mohammed

College of Nursing

University of Babylon

/   /   2021

We, the examining committee, certify that we have read this thesis **(Assessment of Nurses' Knowledge toward Pulmonary Embolism Disease in Critical Care Units at Al-Hila teaching hospitals)** which is submitted by **(Ahmed Ali Abdul Hadi)** from the department of adult Nursing, and we have examined the student in its contents, and what is related to it and we decide that it is adequate for awarding the degree of **(Master)** in nursing Sciences with specialty of **(Adult Nursing)** and estimate of (   )

Prof. Dr.   **Assist Prof. Dr.**

Signature   Signature

Member   **Member**

Date: /   / 2021   Date: /   / 2021

Signature

Chairman

Date: /   / 2021

Approved by the council of the college of nursing

Signature

Prof.Dr.Amean Ageel Yasir

Dean of the College of Nursing, University of Babylon

Date: /   / 2021

Acknowledgements

*First of all, I would like to thank **Allah** who gave me health and strength to accomplish this work.*

I would like to express my sincere thanks to Prof Dr..Amean Ageel Yasir , dean of the college of nursing, university of Babylon.

*I would like to express my great thank to my supervisor (**Dr. Hussam Abbas Dawood**) for the support, guidance, time, encouragement throughout the study period.*

I would like to express my appreciation and thanks to everyone who assisted me in Al Hilla Teaching Hospitals.

Finally, I would like to extend thank and respect to my friends who supported me.

ABSTRACT

Background: Pulmonary embolism is main common reason of cardiovascular death after coronary artery disease and stroke. Preventive thrombus development is a main nursing duty. Consequently, the best managing of pulmonary embolism is by preventive of risk factor and needs to be high-qualified staff.

Objective : Identify the nurses' knowledge toward Pulmonary Embolism disease in critical care unit; and determine the relationships between nurse's knowledge and some demographic variables.

Methodology: A descriptive study using a purposive samples of (N=112) nurses who worked in critical care units. This sample is distributed throughout three hospitals regarding to the Babylon Health Directorate. The overall items which are comprised in the questionnaires, (44) item distributed into four domain. The reliability of questionnaire, which is used to determine through general study and the validity, is accomplished through a list of experts. Data are gather through the use of a self- report techniques and the questionnaire. Data are investigated by the of statistical data analysis method.

Results: The findings revealed that the nurses knowledge towards definition, causes, risks factors of pulmonary embolism were moderate knowledge. While, knowledge in terms of signs & symptoms, diagnostic test, treatment, nursing care plan and complication, the nurses showed poor level of knowledge. The overall knowledge were poor level. There were significance relationship between nurses knowledge and their education, years of experience in CCU and training course at *p-value <0.05*.

Conclusion and Recommendations: More years of experience in critical care unit and training the staff on pulmonary embolism by local officials help raising professionals' nurses. Provide the health resources and exploiting young energies of nurses which indeed helps to develop their knowledge.

List of Contents

List of Figure

NO	TITLE OF FIGURES	PAGE NO
1	**Figure 4-2-1:Knowledge related to Definition, Causes and Risk Factors of Pulmonary Embolism**	62
2	**Figure 4-2-2:Knowledge related to Signs & Symptoms and Diagnostic test of Pulmonary Embolism**	64
3	**Figure 4-2-3:Knowledge related to Treatment and Nursing Care Plan of Pulmonary Embolism**	66
4	**Figure 4-2-4:Knowledge related to Complication of Pulmonary Embolism**	67
5	**Figure 4-2-5: Overall Assessment of Nurses Knowledge**	68

List of Tables

List of Appendices

Appendix	Title
A	Administrative Arrangements
B	English Questionnaire
C	Arabic Questionnaire
D	Panel of Experts
E	Linguistic approval

List of abbreviations

NO.	Items	Meaning
1	M.S	Mean of score
2	χ^2	chi-squared
3	%	Percent
4	S.d	standard deviation
5	$\sum$	SUM
6	AIDS	Acquired immunodeficiency syndrome
7	AMI	acute myocardial infarction
8	BMI	Body mass index
9	CCU	Coronary care unit
10	COPD	Chronic obstructive pulmonary disease
11	CT	Computed tomography
12	CTEPH	chronic thromboembolic pulmonary hypertension
13	CTPA	CT pulmonary angiogram
14	CTPA	computed tomography pulmonary angiography
15	DVT	Deep Vein Thrombosis
16	ECG	Electrocardiography
17	EMPEROR	Emergency Medicine Pulmonary Embolism in the Real World Registry

18	ICOPER	International Cooperative Pulmonary Embolism Registry
19	ICU	intensive care unit
20	INR	international normalized ratio
21	LV	left ventricular
22	MAPPET	Management and Prognosis in Pulmonary Embolism Trial
23	MDCT	Multidetector Computed Tomography
24	MI	myocardial infarction
25	MRI	Magnetic resonance imaging
26	PA	Pulmonary angiography
27	PE	Pulmonary embolism
28	PESI	Pulmonary Embolism Severity Index Score
29	PFO	Patent Foramen Ovale
30	PMT	Percutaneous Mechanical Thrombectomy
31	PTT	Partial Thromboplastin Time
32	RBCs	Red blood cell
33	RTPA	recombinant tissue plasminogen activator
34	RV	Right ventricular
35	RV	right ventricular
36	RVD	right ventricular dysfunction
37	Tc	technetium

38	TTE	Transthoracic echocardiogram
39	VET	Venous thromboembolism
40	WHO	World Health Organization
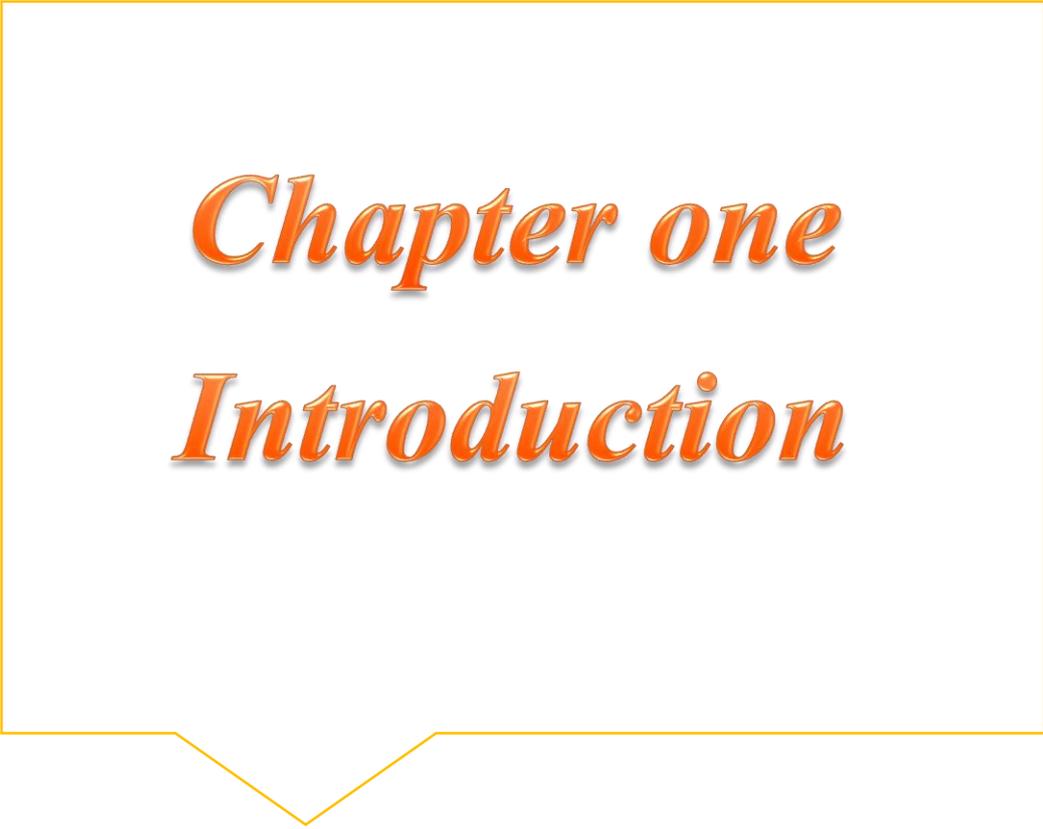
Chapter one
Introduction

Chapter One

1.1. Introduction

Acute pulmonary-embolism is a dangerous   clinical symptom of venous thrombo embolism, and fatal pulmonary embolism is a prevalent cause of sudden death syndrome , usually due to a deep venous thrombosis .

Deep vein thrombosis and pulmonary embolism impact an estimated 300,000 to 600,000 individuals each year, causing more than 100,000 fatalities directly and contributing to another 100,000 deaths, according to the Agency for Healthcare Research and Quality. Because pulmonary embolism might be a medical emergency in certain cases. PE affects 500,000 to 600,000 people in the U.s. each year, with 200,000 to 300,000 fatalities (Turetz et al., 2018) .

Pulmonary-embolism PE, after acute myocardial infarction (AMI) and stroke, is the 3rd more common cardiovascular illness, with an annual occurrence of 1–2 per 1,000 individuals (100–200 per 100,000 population) (Heit, 2008).

Venous thromboembolism (VTE)-related fatalities in Europe were expected to be 543,454 per year in 2001, AIDS (5,860), prostate cancer (63,636),breast cancer (86,831), and traffic accidents (53,599) together account for more than half of all deaths. Because of the challenging diagnosis, depend frequently on the following characteristics, determining the correct yearly number of VTE episodes is difficult. The first is that VTE is frequently clinically quiet, with sudden tragic mortality (30–50 percent of

patients) being the first symptom of the illness(Goldhaber & Bounameaux, 2012).

The second is a clinical presentation that resembles the symptoms of numerous different diseases, leading to misdiagnoses. (Heit et al., 1999); PE identification during autopsy is challenging, requiring a thorough examination of the pulmonary vascular tree to discover tiny acute emboli or the remnants of chronic thrombo-emboli. (Pichereau et al., 2015); Finally, the disease's diagnostic tests' sensitivity and specificity remain low (Di Nisio et al., 2016).

Obesity, immobility, cancer, surgery, cigarette use, pregnancy, trauma, oral contraceptive or hormone replacement treatment, and a past medical history of PE or a known hyper coagulation disease are all risk factors for PE. However, 30 percent of PE patients have no detectable provoking factors, and the mean age of PE patients ranges from 56 to 66 years, according to the "International Cooperative Pulmonary Embolism Registry (ICOPER), Emergency Medicine Pulmonary Embolism in the Real World Registry (EMPEROR)", and Computerized Registry of Thromboembolic Disease registries (Laporte et al., 2008).

Pulmonary-embolism PE and COVID-19 have a connection. PE is reported to occur in 2.6–8.9% of COVID-19 in hospitalized patients and up to one-third of those requiring intensive care unit (ICU) admission despite appropriate preventative anticoagulation. The direct and indirect pathogenic effects of COVID-19, such as complement activation, cytokine release, endothelial dysfunction, and intercellular communication, might explain this (Danzi et al., 2020) .

Pulmonary-embolism PE can show clinically as asymptomatic minor pulmonary-embolus with low death rate to a large PE leading in right ventricular (RV) failure, shock, and/or death (Poissy et al., 2020).

Due to a lack of systematic postmortem investigations, many fatal pulmonary emboli go unnoticed, resulting in an underestimate of their occurrence. The significance of a timely diagnosis of this potentially fatal condition cannot be overstated; consequently, understanding the key characteristics associated with PE may help clinicians establish the diagnosis, allowing for a more effective treatment plan (Pollack et al., 2011).

1.2. Important of study

After coronary artery disease and stroke, pulmonary-embolism is the 3rd leading causes of cardiovascular mortality. On the other hand, studying nurses' knowledge of pulmonary embolism is extremely important because of the small rate of patients admitted to the hospital, as well as the difficulty of diagnosis, as it requires special techniques to diagnose it. It also requires scientific nurses to deal with the patient and contribute to his treatment and participation in preventing this disease, especially if the patient has a family history of the disease (Poyiadji et al., 2020).

According to recent scientific studies and research, pulmonary embolism began to appear as a complication of the disease after a while for those infected with the Coronavirus, and that the virus contributes to the occurrence of blood clots, especially in elderly patients, making it difficult to prevent due to the occurrence of pulmonary embolism in several different forms (Lee et al., 2020).

The overall number of children admitted to the children's wards throughout the 8-year research period was 84,914, according to a study done

in Iraq in the central Euphrates governorates to determine the total number of patients accepted annually by the hospital. During the same time period, 413 children died from a variety of reasons, with just three occurrences of pulmonary embolism, resulting in an annual mortality rate of 0.4 per 100,000 hospitalizations and 0.7 percent of all fatalities (Al-Janabi et al., 2019) .

432,701 people were admitted to maternity wards and general hospital wards throughout the research period, with 5,894 deaths due to pulmonary embolism. As a result, the average number of fatalities (adults) per 100,000 hospitalizations will be 3.4, or 2% of all deaths (Shiraev et al., 2013).

According to this study, the yearly incidence rate of pulmonary embolism in children is 0.4 and adults is 3.4 per 100,000 hospitalizations, respectively, and pulmonary embolism is responsible for 0.7 percent and 2% of all fatalities in children and adults (Chatterjee et al., 2014).

Pulmonary embolisms affect approximately 10 million people each year, pulmonary embolisms cause at least 10,000 to 12,000 deaths in the USA, and they are a primary cause of at least 30,000 to 40,000 death (Becattini et al., 2016).

The exact frequency of pulmonary embolisms is unclear since they are frequently misdiagnosed or managed before autopsy (Turetz et al., 2018) .

The incidence of hospital admissions due to pulmonary embolisms increased from 23 to 65 occurrences per 100,000 persons between 1993 and 2012 (Ende-Verhaar et al., 2017).

A frequent risk factor, venous thromboembolism (VTE), affects adults over the age of 70 at substantially greater rates (3 times higher than those aged 45 - 69) (Goldhaber & Bounameaux, 2012).

This is most likely due to the elderly's lower level of activity, which leads to increased immobility and obesity (Di Nisio et al., 2016).

Venous thromboembolism VTE has a high case fatality rate that is steadily increasing. After 30 days, the rate is around 10%, 15% after three months, and up to 20% after a year. (Turetz et al., 2018) When pulmonary embolisms result in hospitalizations, the case fatality rate is about 5 to 10 percent, thus VTE may have a substantial influence in the severity of the embolisms (Stein et al., 2012).

Between 2013 and 2015, pulmonary embolism was the leading causes of mortality in Europe, with an estimated 40,000 fatalities per year, a cautious estimate owing to probable underdiagnoses (Lodigiani et al., 2020).

Embolism affects roughly 117 individuals per 100,000 persons globally, according to a research conducted in the United States, resulting in around 350,000 cases (potentially 100,000 in the United States) and up to 85,000 fatalities. Adults, on the overall, have a positive attitude. Despite this increase, medical advances have resulted in a decrease in mortality during the same time. (Clark et al., 2014)

1.3. Objective of the study are to:

1.   Assess the nurse's knowledge of Pulmonary Embolism disease in the critical care unit.

2.   Find out the relationships between nurse's knowledge and some demographic variables like age, gender, level of education, training session in the critical care unit, years of experience in nursing, and years of experience in the critical care units.

1.4. Statement of the study:

Assessment of Nurses' Knowledge toward Pulmonary Embolism Disease in Critical Care Units at Al-Hila teaching hospitals

1.5. Definition of the Terms

1.5.1. Assessment

Theoretical Definition:

The act of judging or deciding the amount, value, quality or importance of something, or the judgment or decision that is made (Dictionary, 2017)

Operational Definition:

It is the process of collecting and analyzing data on evaluating nurses' knowledge about pulmonary embolism in critical care units at Hilla Teaching Hospitals

1.5.2. Pulmonary embolism (PE)

Theoretical Definition:

It a life-threatening condition which can result in acute right ventricular (RV) failure Because most patients ultimately die within the first hours of presentation, early diagnosis is very important (Kuo, 2012).

Operational Definition:

A pulmonary embolism (PE) is an obstruction of arteries in the lungs caused by a material that has traveled through the circulation from elsewhere in the body (embolism).

1.5.3. Knowledge

Theoretical Definition:

The capacity to acquire, retain and use information, a mixture of comprehension experience discernment and skill (Perkins, 2013).

Operational Definition:

The degree to which that nurse has information about pulmonary embolism, the signs and symptoms, risk factors, nursing care, treatment, and how to protect the patient from pulmonary embolism .

1.5.4. Nurse:

Theoretical Definition

is a profession within the health care sector focused on the care of individuals, families, and communities so they may attain, maintain, or recover optimal health and quality of life (Aiken et al., 2012).

Operational Definition

The person who works at critical care unit and responsible for caring a patient.

1.5.5. Critical Care Unit

Theoretical Definition

Critical Care Unit is a specially designed and equipped facility staffed by skilled personnel to provide effective and safe care for patients with a life-threatening problem that is potentially reversible (Azoulay et al., 2005).

Operational Definition

Critically ill patients receive specialized treatment such as intense monitoring and enhanced life support by receiving highly extensive nursing care in certain areas of the hospital.

Chapter two

Literature review

Chapter Two

LITERATURE REVIEW

This chapter aims at searching the literatures and studies related to the current study. It includes the following parts:

2.1. Lungs Anatomy

The lung are the most important organ of the respiratory system, and they are in charge of gases exchange. They are join up and separated into lobes, with the left lung having two lobe and the right lung having three. The parasympathetic and sympathetic neural systems innervate the lungs, coordinating Broncho dilation and bronchoconstriction of the airway. The pleura, a membrane made up of visceral and parietal pleural layers, surrounds them. The pleural cavity is the space between these two layers (Drake et al., 2009).

Pleural fluid is produced by the mesothelium cell of the pleural membrane and functions as a lubricant (to prevent friction through breathing). The lungs are seldom infarcted by a pulmonary embolism because two circulatory systems feed them: the pulmonary vascular system and the bronchial vascular system, both of which include numerous anastomoses, as discussed later. The bronchial vascular system connects to the pulmonary system by a wide network of pre- and post capillary anastomoses, which can enhance flow by up to 300 percent (Standring et al., 2008).

When arteries with a diameter of 3 mm or smaller are blocked, lung infarction is more common than when the central pulmonary artery is obstructed. After a pulmonary embolus, the bronchial arteries continue to provide oxygen to the parenchyma, but they also supply the pulmonary capillary network via anastomoses. Blood cell extravasate into bronchial and the alveolar cavities due to higher bronchial artery pressure than capillary system pressure, as well as locally increased capillary endothelial injury and vascular permeability, results in hemoptysis. When there is a lack of blood flow, hemorrhage can lead to a lung infarction (e.g., hypotension, shock, use of vasodilators) (Duncker, 2013).

2.2. Anatomy of pulmonary circulation

2.2.1. Adult pulmonary circulation

Pulmonary circulation is the movement of blood from the heart to the lung and returns to the lungs. Deoxygenated blood leave the RV of the heart via the pulmonary artery. The tricuspid valve (also known as the right atrioventricular valve) ejects venous blood into the RV, which is then forced out through the pulmonary valve and into the pulmonary trunk. The blood is subsequently forced into the left and right pulmonary arteries (1 for each lung), where it travels via the pulmonary semilunar valve and into the lung (K. L. Moore & Dalley, 2018).

During respiration, the pulmonary arteries transport deoxygenated blood to the lungs, where carbon dioxide is exhaled and oxygen is gained. The pulmonary artery is essential to notice since it follows the bronchial tree, bifurcates with it, and then enters the lung. When it enters the alveoli, it

produces a thick network of capillaries that surrounds the alveoli like a flowing sheet, allowing for efficient blood oxygenation (Tortora & Derrickson, 2018).

The pulmonary vein carries oxygenated blood back to the heart's left atrium. The oxygenated blood then exits the lungs and returns to the left heart through pulmonary veins, completing the pulmonary cycle. The blood then flows into the left atrium, where it is pumped into the LV via the bicuspid valve (also known as the mitral or left atrioventricular valve). The aortic valve transports blood from the LV to the aorta. After that, the blood is transported throughout the body via the systemic circulation before returning to the pulmonary circulation (Sommer et al., 2008).

The bronchial artery is a branch of the aorta that delivers oxygen and nutrients to the lung parenchyma and tissue. The veins then carry the deoxygenated blood away. The azygous and hemiazygous veins get a modest quantity of bronchial blood. Capillaries arising from the bronchial arteries anastomose with those generated by the pulmonary arteries at the level of the respiratory bronchioles. The pulmonary veins drain the bronchial circulation, resulting in some venous mixing of oxygenated pulmonary vein blood with deoxygenated bronchial vein blood (Judge et al., 2014).

The usual RBCs spends 0.75 second in the pulmonary capillary after passing through at least three alveoli (this time can decrease to 0.3 second during exercise). In the human body, there are 300 million alveoli and 280 billion a high anastomosing capillaries. In comparison to the rest of the circulatory system, where a drop in oxygen or metabolites induces vessel

dilatation, a decrease in O2 absorption by the blood causes pulmonary artery vasoconstriction and higher resistance. Low O2 levels have a significant impact on pulmonary vascular resistance because blood flow is distributed where it is most efficient (Chaudhry & Bordoni, 2017) .

2.3. History of pulmonary embolism

Nothing is sadder than dying suddenly and unexpectedly from a large pulmonary embolus after a seemingly normal recovery from a minor medical condition or regular surgical treatment. More than 200,000 individuals die from pulmonary embolism every year in the USA, out of the approximately 650,000 persons who have pulmonary thromboembolic illness. Because many instances go undetected, this number is likely low. Pulmonary embolism is the most prevalent pulmonary disease discovered at autopsy in hospitalized patients and the leading cause of deaths in the USA (Dalen, 2002; Judge et al., 2014) .

The majority of DVTs begin in the calf and resolve on their own. Leg discomfort and symptomatic PE are uncommon in thrombi that stay limited to the calf. With the intensity of the starting prothrombotic stimulation, the likelihood of calf DVT spreading to the proximal veins and causing PE rises (Kearon, 2003; Li et al., 2015).

Although most patients with acute VTE had thrombosis in both legs and lungs at the time of diagnosis, most individuals have thrombosis in both. Anticoagulant therapy for proximal DVTs is sluggish, and thrombi are still visible in half of the patients after a year. Patients with a big initial thrombus or cancer have a worse chance of resolving DVT (Boutitie et al., 2011) .

Within five years, 10% of individuals with symptomatic DVTs develop severe post-thrombotic syndrome. Despite diagnosis and treatment, 10% of PEs are deadly right away, and another 5% result in mortality later. Right ventricular dysfunction is linked to 50 percent of identified PEs, which is linked to a 5-fold higher in-hospital death rate. After one month of therapy, PE resolves in half of the patients, and perfusion recovers to normal in two-thirds of them. As a result of inadequate resolution, 5% of treated PE patients develop pulmonary hypertension. Patients without reversible risk factors have a greater chance of recurrent thrombosis after a course of therapy (Kearon, 2003).

2.4. definition

Pulmonary embolism (PE) can cause acute right ventricular failure, which is a life-threatening disease, due to pulmonary bed blockage. Early diagnosis is critical because the majority of patients die within the first few hours after presentation (Bělohlávek et al., 2013) .

The risk of dying from a pulmonary embolism varies considerably based on a number of factors, including age, concomitant diseases, and the stability of the patient on presentation. Low-risk PE patients had a one year survival rate of nearly 95%. Patient with high-risk PE and hemodynamic instability, on the other hand, had a death rate of about 40percent within 90 days. The fundamental pathophysiology of PE, risk factors for developing PE, and conventional diagnostic testing methods will be discussed in this review. We'll also go over risk classification for individuals with PE and how that affects treatment and outcomes. While no accurate epidemiological

data is available, the incidence of PE is believed to be 60 to 70 in 100,000 in the general population, and that of venous thrombosis to be 124 in 100,000 (Prandoni et al., 2016) .

Annual incidence rate of venous thrombosis and PE of around 0.5 to 1.0 in 1000 people are reported in European recommendations for the diagnosis and management of PE (Members et al., 2008).

However, since silent PE may develop in up to 40percent to 50percent of individuals with deep vein thrombosis, the true statistics are likely to be much higher (DVT) (Members et al., 2008).

2.5. Causes of pulmonary embolism

When blood accumulates (or pools) in a specific region of the body, pulmonary embolism can develop (usually an arm or leg). Blood pooling is common during prolonged periods of inactivity, like following bed rest or surgery (Hutchinson et al., 2015)

When a vein has been damaged, such as by a fracture or surgery (especially in the hip, pelvis, knee or leg) (Van Der Pol et al., 2019)

As a result of some other health condition, like congestive heart failure, atrial fibrillation, or a heart attack, or a stroke.

When blood clotting factors are raised, enhanced, or, in certain circumstances, reduced. Those forms of cancer, as well as some women on hormone replacement treatment or birth control pills, might cause elevated

clotting factors. Hereditary disorders can potentially result in abnormal or reduced clotting factors (Francis, 2007).

The hospital mortality rates of PE in untreated PE patients and treated PE patients are approximately 30% and 8%, respectively Unfortunately, two-thirds of all PE cases are diagnosed by autopsy. Pulmonary embolism causes death in approximately 16% of hospitalized patients (Ye et al., 2014).

Barrit and Jordan published a study in 1960 that compared anti-coagulation to placebo for the treatment of pulmonary embolism and found a 26 percent death risk linked with untreated PE. In 1957, Barritt and Jordan conducted their research at the Bristol Royal Infirmary. This is the first and only placebo-controlled experiment to look at anticoagulant effectiveness in the treatments of PE. The study was not repeated since the results were so convincing. On the other hand, the stated death rate of 26percent in the placebo group may underestimate real mortality insofar as diagnostic technology's sensitivity and specificity in 1957 may have only allowed for the identification of major PE (Chatterjee et al., 2014).

2.6. The following factors have been related to increased incidence of death in PE

- o   Age more than 60 years
- o   Congestive heart failure
- o   Pulmonary hypertension
- o   Ischemic heart disease
- o   Lung disease that has been chronic
- o   Cancer

    o   Stroke

Increased mortality in PE is related to the development of congestive heart failure or malignancy (Francis, 2007).

Only 2.5 percent of one-year death in individuals who had an episode of PE is due to PE itself (typically during the first two weeks), whereas the remaining two-thirds of one-year mortality is due to other medical problems such as heart disease, lung illness, cancer, or sepsis (Zhou et al., 2012).

- The rate of mortality from PE varies depending on the severity of the condition
  - Massive PE, also known as high-risk PE, is linked to an incidence of early death from PE of more than 15%b(Members et al., 2008).
  - A rate of PE-related early mortality ranging from 3 to 15% is associated with submassive PE, also known as intermediate risk PE (Members et al., 2008).
- Low risk PE is associated with a rate of PE-related early mortality of <1% (Members et al., 2008).

According to estimates, 60,000-100,000 Americans die with VTE each year, with 10 to 30 percent dying within one month after diagnosis (Beckman et al., 2010) .

According to a study of multiple-cause mortality statistics gathered by the National Center for Health Statistics from 1979 to 1998, PE was diagnosed in over 600,000 individuals (about 1.5 percent) out of 42,932,973

fatalities. PE may have resulted in the deaths of 200,000 of those individuals (Mestre-Gómez et al., 2021).

2.7. Clinical Correlates of Mortality among Patients with Pulmonary Embolism

2.7.1. Hemodynamic Status

Shock and hypotension are primary high-risk markers of early death in acute PE, according to observational studies such as the International Co-operative Pulmonary Embolism Registry (ICOPER) and the Management and Prognosis in Pulmonary Embolism Trial (MAPPET). The MAPPET research found that systemic shock was related to a 24.5 percent death rate, whereas hypotension (but not shock) was linked to a 15.2 percent mortality rate (Takahashi et al., 2012) .

The 90-day all-cause death rate was 52.4 percent in patients with systolic blood pressure less than 90 mm Hg, compared to 14.7 percent in those with normal blood pressure, according to a post-doc analysis of the International Co-operative Pulmonary Embolism Registry (ICOPER) research (Kucher et al., 2006).

2.7.2. Marker of Right Ventricular Dysfunction (RVD)

In the case of pulmonary embolism, the present of right ventricular dysfunction (RVD) on echocardiography has been linked to a higher death rate (Barco et al., 2019) .

2.7.3. Brain Natriuretic Peptide

Raised up plasma concentrations of natriuretic peptide (N-terminal pro-brain natriuretic peptide and brain natriuretic peptide) were linked to a greater mortality rate in pulmonary embolism patients (Lankeit et al., 2014).

N-terminal pro-brain natriuretic peptide levels more than 500 ng/L are a marker for the severity of PE and are linked to mortality (Alonso-Martínez et al., 2009).

2.7.4. Serum Troponin

Increased blood troponin levels are linked to a higher risk of mortality in individuals with pulmonary embolism. Troponin increase in individuals with a large pulmonary embolism is due to transmural RV infarctions on autopsy, not pericardial coronary artery disease (Rahman & Broadley, 2014).

2.7.5. Hyponatremia

Hyponatremia at the time of presentation of PE is associated with increased mortality and hospital readmission (Scherz et al., 2010).

2.7.6. Electrocardiographic Abnormalities

The electrocardiographic findings in pulmonary embolism lack specificity and sensitivity and their prognostic value is limited. Development of a QR wave in lead V1 has been recognized as an independent risk factors for an adverse prognosis (Kukla et al., 2014) .

2.8. Pathophysiology

PE happens when clot in the deep venous detach or break free, move through the heart, and lodge in the pulmonary circulation. Larger PE can induce a rapid and sustained rise in pulmonary artery pressure, which can cause a cardiovascular collapse. The consequences of an embolus are determined by the amount to which it obstruct the pulmonary circulation, the time it takes for that blockage to accumulate, and the patient's pre-existing condition, which is very loosely defined. In non-embolized lung segments, several humeral mediators (thromboxane or serotonin from active platelets) might presumably cause vasospasm. As a result, pulmonary hypertension can develop at a rate unrelated to the amount of mechanically blocked vasculature (Bělohlávek et al., 2013) .

Dyspnea both with and without pleuritic pain and hemoptysis is the most prevalent manifestation (acute minor pulmonary embolism). Hemodynamic instability is the second symptom. Acute severe pulmonary embolism is linked to it. The third and least prevalent appearance, especially among the elderly, resembles heart failure or pneumonia (sub-acute massive pulmonary embolism) (Lewis et al., 2000)(Oqab et al., 2018).

2.9. Risk stratification

Risk assessment is crucial in helping nursing to provide the best therapy to their patient. PE had demonstrated to encompass a broad range of clinical severity, with early death rate ranging from less than 1percent to more than 50 percent (Meyer et al., 2016).

A substantial body of evidence suggest that progressive risk stratification can differentiate between intermediate and low clinical risk in the normotensive patient. Advanced age, major underlying condition (CA and cardiac or respiratory disease), clinical sign of right ventricular dysfunction (tachycardia and hypotension) and hypoxemia are the chief clinical determinant of the outcome of patient with PE (Bělohlávek et al., 2013)

There are a number of factors that might raise the risk of DVT and PE. Such factors can be passed down via the generations, acquired through time, or triggered. Several hereditary disorders raise a patient's risk of the most prevalent of which are factor V Leiden and prothrombin genes mutation (G20210A), which have population prevalence of 4-5 percent and 2-4 percent, correspondingly (Raja et al., 2015) .

The risk of VTE in people with factors V Leiden is 2-7 times higher in heterozygous individual and upward to 40 times higher in homozygous individual (Toplis & Mortimore, 2020).

Advancing age, obesity, venous insufficiency, smoking, cardiovascular disease, rheumatologic diseases, prior VTE, and antiphospholipid antibody syndrome are the most recurrent acquired risk factor for VTE. Natural circulating anticoagulant (protein S and protein C) tend to decline more than pro-coagulation factor with age, resulting in an enhanced prothrombotic condition. In the aged, this, along with increased venous instability in the lower limbs, raises the risk of DVT and PE. Overweight is a recognized risk factors for VTE, and data from the Nurse '

Health Study found a 6-fold increase in risk among the most overweight participants (BMI >35) compared to normal-weight people (Toplis & Mortimore, 2020) .

Patients will be classified as low-risk, intermediate-risk, or high-risk according on the categories used to identify PE risks (Sanchez et al., 2010).

2.9.1. High risk

Even with proper therapy, patients with pulmonary embolism who arrive with bradycardia, hypotension, syncope, or an incapability to maintain sufficient oxygen are at risk for sudden deaths. Patient with a significant PE with a persistent clot in the heart (clot-in-transit) or the iliofemoral veins must be considered decompensated. High-risk patients frequently require immediate treatment and admission to an ICU (Aggarwal, 2012) .

2.9.2. Intermediate risk

Patient with end organs impairment who are hemo dynamically stable are classified as intermediate risk. In the event of a major PE, right heart strain on echocardiography is also linked to an elevated risks of clinical worsening and/or short-term mortality. Other factor, including an increased troponin level suggesting myocardial ischemia, changed cerebral status, and co-morbid disease, have also been linked to early clinical worsening and a greater risk of short-term mortality (Sanchez et al., 2010).

2.9.3. Low risk

Patients with PE who show no signs of end organ damage or hemodynamic instability could be allowed to be safely discharged after starting anticoagulation early. In a study of 298 patient with pulmonary embolism, we discovered that two third of them had no clinical worsening and requiring no hospital-based treatments following the procedure. This implies that a substantial majority of individuals who have had a PE do not benefit from hospitalization and could be able to be discharged from the emergency room. Clinical worsening was shown to be linked to hypotension, history of cardiovascular disease, hypoxia, signs of right heart strain, and persistent DVT. Patients who have none of these risk factor are likely to have a low risk of clinical worsening and are good candidate for early release after starting anticoagulation (Kabrhel et al., 2014).

2.10. The severity of the pulmonary embolism

Pulmonary embolism can be classified depending on the location of the clot or the severity of the patient's condition. The following phrases are being used to describe the location of a clot in the pulmonary artery.

A) Saddle PE (huge clot in main pulmonary artery) .

B) Lobar PE (large clot in pulmonary artery branch).

C) Distal PE (into small branches of pulmonary artery).

Clots are seen in smaller branches as they move from category 'A' to 'C'. Pulmonary embolism can be classified as low, moderate, or high risk

depending on how ill the person is. This is the danger of dying or suffering significant consequences. The severity of a person's condition is also determined in part by how symptomatic they are, how well their lungs are performing, and how low their blood pressure is. A healthcare professional must order a variety of blood tests and imaging to determine risk and severity (x-rays or scan or ultrasound of the heart). Treatment options are also influenced by the risk or severity of the condition (Hanna, 2017).

2.11. Course of the Disease

Pulmonary embolism can cause lung tissue necrosis (infarction) Because it necessitates simultaneous stoppage of lung ventilation and pulmonary perfusion via the pulmonary and bronchial arteries, this condition is uncommon (approximately 10%) (Lambrini et al., 2018) .

The process of re-establishing the damage via thrombus lysis by fibrinolytic processes begins a few days after the embolus is installed, and eventually the damage is arranged in such a manner that the clot is transformed to a tiny scar adhering to the arterial wall. This process requires 10-14 days to complete (Stein et al., 2009) .

The formation of collateral bronchial movements restores flow in the capillary network, resulting in progressive restoration of surfactant production, hypocapnia, atelectasis, and vasoconstriction in instances where, despite the preceding processes, the restoration of circulation is delayed (Lambrini et al., 2018).

2.12. Clinical presentation:

The consequences of an embolisim are determined by the amount to which it obstruct the pulmonary circulations, the time it takes for that blockage to accumulate, and the patient's pre-existing condition, which is very loosely defined. Patient with pre-existing cardiac illness, also those who are elderly, weak, or debilitated, are more susceptible to the consequences of pulmonary embolism than those who were healthy before to the embolus condition. With the exception of persistent thromboembolic pulmonary hypertension, pulmonary embolism may be divided into three categories. Dyspnea with or without pleuritic discomfort and hemoptysis is the initial and most frequent symptoms (acute minor PE). Hemodynamic instability is the second symptom, which is connected to acute large PE. The 3rd and least prevalent appearance, especially in the elderly, resemble heart failure or indolent pneumonia (sub-acute massive PE)(Oqab et al., 2018).

2.13. Acute minor pulmonary embolism

The prognosis for acute minor PE is excellent, with a three-month death rate of less than 1 percent. It might be asymptomatic or simply cause tachypnea (24 breath per minute) and tachycardia (100 beat per minute), or it can cause a modest rise in body temperature. Quiet PE is not uncommon; in a study of 622 patients with proximal DVT published in 2000 by Meignan et al, 40 percent to 50 percent of the patients had silent PE identified by regular lung perfusion scans (Poyiadji et al., 2020).

2.14. Acute massive pulmonary embolism

Acute massive PE (high risk) is the most severe kind of PE, with death rates surpassing 20percent regardless of therapy. Persistent hypotension, Hemodynamic instability (ie, syncope), and cardiogenic shock (with hypotension recognized as a rapid drop in systolic blood pressure to 90 mmHg, or about 40 mmHg from baseline) are all symptoms of acute massive PE. This can happen so quickly that syncope is either the first symptom or can be readily triggered by a small circulatory stress. If the blockage is severe enough, death happens nearly instantly. The combination of a drop in aortic pressure and an increase in right ventricular pressure can result in right ventricular ischemia due to a significant loss in right coronary perfusion. The most common cause of ultimate cardiac arrest is electromechanical dissociation (Xie et al., 2020).

2.15. Subacute massive pulmonary embolism

Multiple tiny or medium large emboli build over several weeks, causing this. Because there is a time for altered copy and the extent of right ventricular failure is less for a given degree of PE, the elevations in right ventricle end diastolic and right atrial pressures are smaller than in acute massive pulmonary embolism. Increased dyspnea and decreased exercise tolerance are the primary symptoms. A dry cough is frequently present. Breathlessness is generally out of proportion to all other symptoms, and core cyanosis may be present (Condliffe et al., 2014).

2.16. Diagnostic procedures

Pneumococcal embolism is difficult to diagnose clinically, especially when there is a history of lung or heart illness. Almost all patient with PE have one or more of the following symptoms: tachypnea (> 20 breaths/minute), sudden onset dyspnea, or chest pain (pleuritic or sub sternal); if the clinician remembers these three characteristics, the probability of pulmonary embolism is rarely overlooked. The chance of pulmonary embolism is high when these clinical characteristics are combined with ECG signals of right ventricular strain and/or radiologic evidence of pulmonary infarction, plump hilum, or oligaemia, and it is even higher when risk factor for VTE are present. The lack of these 3 clinical characteristics, on the other hand, essentially eliminates the diagnosis of PE (Frederikus A Klok et al., 2010).

Electrocardiography

Tachycardia and non specific ST-T wave irregularities are the most prevalent Electrocardiography abnormalities in the setting of PE. In the absence of symptoms suspicion for pulmonary embolism, the finding of S1 Q3 T3 is vague and insensitive. Tall, peaked P wave in lead II (P pulmonale); right bundle-branch block; right axis deviation; an S1 Q3 T3 pattern; or atrial fibrillation are all typical finding of right heart strain with acute Cor-pulmonale. Only 20percent of patients with a confirmed PE exhibit any of these typical ECG anomalies (Menno V Huisman & Klok, 2013).

Chest radiography

In certain instances of pulmonary embolism, chest radiographs are abnormal, although the results are vague. Atelectasis, parenchymal opacities, pleural effusion, and hemi diaphragm elevation are all prevalent radiographic abnormalities. A wedge-shaped, pleura-based triangular opacity with an apical pointing toward the hilus (Hampton hump) or reduced vascularity are characteristic radiographic evidence of pulmonary infarction (Westermarck sign). These symptoms are indicative with PE, however they are uncommon. pulmonary edema, Cardiomegaly ,and abrupt tapering or termination of a pulmonary artery due to embolus (knuckle sign) are further symptoms (A. J. E. Moore et al., 2018).

Echocardiography

Acute PE can result in pressure overload and RV dysfunction, which able be noticed by echocardiogram. Numerous echocardiographic indicator have been proposed for non invasive diagnosis of right ventricular failure at the bedside, counting right ventricular hypertrophy and/or hypo kinesis of the free wall, leftward septal shift, and symptoms of pulmonary hypertension (Pruszczyk et al., 2014).

Blood tests

A normal D-dimer level is enough to rule out thrombotic PE in individuals with a low or moderate suspicion of pulmonary embolism, with a 3-month risk of thromboembolic event of 0.14 percent. The D-dimer is quite sensitive, yet it isn't selective (specificity around fifty percent). In

other terms, a positive D-dimer is not always associated with PE, while a negative D-dimer is almost always associated with the lack of PE (Goldhaber & Bounameaux, 2012).

The standard cutoff is 500 g/L, however this changes depending on the test. hypocapnia, Hypoxemia, and respiratory alkalosis are all common findings in arterial blood gas. Scintigraphy of the lungs For suspected pulmonary embolism, ventilation–perfusion scintigraphy (V/Q scan) is a well-established diagnostic technique. Although a few adverse responses have been reported, it is considered harmless. The test involves injecting technetium (Tc)-99m-labeled macro aggregated albumin particles into the bloodstream, which block a small portion of the pulmonary capillaries and allow scintigraphic evaluation of lung perfusion. Multiple tracers like xenon 133 gas, Tc-99m-labeled aerosols, or Tc-99m-labeled carbon micro particles (Technegas) can be utilized in perfusion scans and ventilation investigations. The objective of the ventilation scan is to improve specificity: in acute pulmonary embolism, ventilation in hypo perfused segments is predicted to be normal (M V Huisman & Klok, 2013).

Computed tomography (CT, spiral or electron beam CT)

In patients with suspected PE, computed tomographic angiography has become the technique of choice for visualizing the pulmonary vasculature. It provides for good visibility of the pulmonary arteries below to the segmental level at the very least. A negative CT exhibited a strong negative predictive value for pulmonary embolism in patient with a low or intermediate symptoms likelihood of pulmonary embolism (96 percent and

89 percent, respectively), but this was only 60percent in those with a high pre-test likelihood. In patients with an intermediate or high clinical probability of PE, the positive predictive value of a positive CT were high (92–96%), but significantly lower (58%) in patients with a low pre-test chance of PE. As a result, physicians must exercise extreme caution in cases where clinical judgment and MDCT results disagree (Meinel et al., 2015).

Magnetic resonance imaging (MRI)

Indication of PE can be identified with magnetic resonance imaging (MRI) utilizing conventional or gated spin-echo methods. Within the pulmonary artery, pulmonary emboli show enhanced signal intensity. This signal, which is caused by sluggish blood flow, may be differentiated from PE by acquiring a series of pictures. Therefore, with pulmonary hypertension, this is still a concern. For lobar, central, and segmental emboli, MRI has a sensitivity of 85 percent and a specific of 96 percent, but it is insufficient for the identification of subsegmental emboli (Revel et al., 2012).

Pulmonary angiography

Has long been the gold standard for diagnosing pulmonary embolism. A filling defects or a severe cut off of the afflicted artery are both positive findings (Kalb et al., 2012).

2.17. Treatment

Hemodynamic management

In individuals with severe PE, acute RV failure with poor systemic output is the primary cause of mortality. As a result, in patient with pulmonary embolism and RV failure, supportive therapy is critical. Experiments show that forceful volume expansion has little advantage and may potentially harm RV functions by inducing mechanical overstretch or depressing contractility through reflex mechanism (Konstantinides et al., 2016).

In individuals with PE, low cardiac index, and normal blood pressure, a moderate (500 mL) fluid challenge may assist to raise cardiac index (Konstantinides et al., 2017).

The role of thrombolytic therapy

Over the last half-century, randomized trials have been conducted on fibrinolytic agents, and those presently approved for clinical use have recently been reviewed (Members et al., 2014).

A review of 15 studies comprising a total of 2,057 patient found that fibrinolysis significantly decreased overall mortality and the combination endpoint of death or treatment escalation. Prolonged infusion of first-generation thrombolytic medicines over 12–24 hours are superior to accelerated regimens delivered over 2 hours. In acute PE, reteplase and

desmoteplase were compared to recombinant tissue plasminogen activator (rtPA), with identical outcomes in terms of hemodynamic parameters; in intermediate-risk PE, tenecteplase was compared to placebo (Members et al., 2014).

PE can be effectively treated with anticoagulation. Heparin has been shown in studies to lower both death and the occurrence of recurrent pulmonary embolism. 2,9–29 Anticoagulation permits endogenous fibrinolysis activity to breakdown existing thromboembolic by inhibiting clot formation. This procedure has a variable rate of occurrence. Although full clot lysis has been recorded in as short as seven days, resolution usually takes week or month; nonetheless, in many patient, resolution remains partial after many month. 12, 23, 30–32 Thromboembolism may form in these individuals, resulting in persistent constriction or obliteration of the pulmonary vascular bed. Thrombolytic therapy offers numerous potential benefits over anticoagulation's in the treatments of individuals with PE since it really dissolves thromboembolism. For starters, it should result in quicker clot clearance and improved pulmonary perfusion, hemodynamic changes, and gas exchange. Second, thrombolysis must dissolve venous thrombi, lowering the risk of recurrent pulmonary embolism. Third, full and fast clot clearance should avoid persistent vascular blockage and lower the risk of pulmonary hypertension (Konstantinides et al., 2017).

Ultimately, thrombolytic treatment should lower PE mortality and morbidity through all of these pathways (Meyer et al., 2016).

Oral anticoagulants

While the body attempts to break up the clots, these medicines stop future clots from developing. Heparin is a common anticoagulant that may be injected beneath the skin or administered through a vein. Most patients who have a pulmonary embolism will need heparin injections for at least five days before switching to warfarin alone. Novel oral anticoagulants such as dabigatran, rivaroxaban, and apixaban, are a newer family of anticoagulants that have been studied and authorized for the treatment of venous thromboembolism, involving pulmonary embolism. Anticoagulant, like any other medicine, can have adverse effects, which vary from individual to individual. Bleeding more readily and abundantly is among the most serious issues. As a result, you'll need to get frequent blood tests to make sure you're on the right dosage (Vedovati et al., 2015).

vena cava filter

A filter can be placed in the inferior vena cava with the use of a catheter. This filter may help prevent blood clots from entering your lungs. This technique is usually reserved for patients who are unable to take anticoagulant medications or for those who find that anticoagulant drugs do not function well or quickly enough. Whenever a filter is no longer needed, it can be uninstalled (Mismetti et al., 2015)

Percutaneous Mechanical Thrombectomy (PMT)

In individuals who have an absolute contraindication to thrombolysis, a variety of percutaneous methods have been employed alone or in combination. This included:

1) Thrombosis fragmentation using a spinning pigtail catheter.

2) Thrombectomy via aspiration.

3) Thrombectomy using hemolytic agents.

4) Suction embolectomy.

The first instances of catheter-based intervention for acute PE are presumably thrombus fragmentation methods employing balloon angioplasty or rotation of pigtail catheters. In people with an absolute contraindication to systemic fibrinolysis, the optimum PMT approach is decided on an individual basis (Bayiz et al., 2015).

Surgical embolectomy

The first effective surgical PE removal was in 1924, decade before medicinal therapy for PE became available. Technically, a pulmonary embolectomy is a rather easy procedure. Patients do not need to be moved to a specialized cardiothoracic center if on-site embolectomy utilizing extracorporeal circulation is available, since the location of surgical treatment does not appear to have a substantial influence on operational results. In urgent cases, transportable extracorporeal support devices with percutaneous femoral cannulation can help maintain circulation and oxygenation until a clear diagnosis is made (Aymard et al., 2013).

2.18. Complications

Acute Complications

- Atrial flutter
- Heart failure or shock
- Pulmonary hypertension
- Pulseless electrical activity
- Sudden cardiac death (F A Klok et al., 2014).

Chronic Complications

- Chronic thromboembolic hypertension (rare - 1%)
- Pulmonary   hypertension
- Recurrent pulmonary embolism (Bova et al., 2014)

Complications of Firbrinolytic Therapy for Pulmonary Embolism

- Severe   bleeding   can   occur   as   a   complication of fibrinolytic treatment:

- Major hemorrhage - 10%
- Non major hemorrhage - 20%
- Intracranial hemorrhage - 0.5% (F A Klok et al., 2014)

2.19. Prognosis

Pulmonary embolism (PE) has a mixed prognosis. Data from registries, previous studies, and hospital discharge documents obtained from varied patient populations have restricted the accuracy of estimations. A

patients of a single, asymptomatic sub segmental PE, for example, is likely to have a dissimilar prognosis than one with a large PE and shocks. PE, on the other hand, is linked with an overall mortality of up to 30percent if left untreated, comparing to 2 to 11% in those managed with anticoagulation (Beckman et al., 2010).

Pulmonary embolism-related mortality appears to be reducing, with rate dropping from 3.3 % (2001-2005) to 1.8 percent (2010-2013) in one research and from 17 to 10percent in another (den Exter et al., 2013).

Another study that derived data from the World Health Organization (WHO) mortality database reported a similar decrease in deaths from 12.8 per 100,000 to 6.6 per 100,000 between 2000 and 2015 (den Exter et al., 2013).

Define early outcome as those that occur during the first 3 month of receiving a PE diagnosis. The first seven days have the highest risk of events; shocks and recurring PE are the most prevalent causes of morbidity and mortality during this time.

Shock can be the first symptom of PE or a complication that develops early (8 % of patient). It's the most prevalent cause of early mortality, especially in the first week, and it's linked to a 30 to 50percent chance of dying if it's present (Elias et al., 2016).

The significant risky of mortality, which is a great between 1-2 the first hour after presentation, supports using reperfusion treatment (thrombolytic/embolectomy) instead of anticoagulation. Because the risk of

hemodynamics   collapse (e.g., right ventricle dysfunction) remains increased for 72 hours or longer, careful monitoring of this population, in addition to those deemed at risk of hemodynamic collapse (e.g., right ventricle dysfunction).

Relapse - The number of repeats (deep vein thrombosis and PE) is highest in the first 2 week and gradually decreases after that. While on anticoagulant treatment, the accumulated proportion of clients with early recurrence is 2percent after 2 weeks and 6percent after 3 months (Wielpütz et al., 2014)

Cancer and failure to attain therapeutic anticoagulation level quickly are important predictors of higher risk of relapse during this time (Sen et al., 2014).

Pleuritic/alveolitis and pneumonia – clients may deteriorate and have respiratory failure, deteriorating oxygenation, hypotension, discomfort, and/or increase body temperature in the 1-2 weeks following diagnoses, indicating a developing infarct and/or superimposed pneumonia. Although chest radiography may indicate atelectasis, collapse, or a pleural effusion, these patients must have definitive imaging (ideally with the initial diagnosis imaging modality) to differentiate these diagnoses from recurring PE. Without recurring, patients should be treated symptomatically with supplementary oxygen, analgesics, and intravenous fluid, as well as ventilation, vasopressors, and/or antibiotic, if needed (Heit et al., 2011).

●Stroke – In patients with acute PE, retrospective and prospective investigations have shown an elevated risk of stroke, which is considered to

be related to paradoxical embolism through a patent foramen ovale (PFO) (Eikelboom et al., 2017)

Stroke prevalence rates have varied from 7 to 50 percent (average 17%), with greater rate in those with PE who also had a PFO (21 – 64 percent, averaging 33%). A prospective study of 361 individuals with acute PE who received magnetic resonance imaging and contrast transthoracic echocardiography of the brain (for hidden or symptomatic stroke) within 10 day of diagnosis of PE best illustrates this risk for stroke (Le Moigne et al., 2019).

Stroke was found in 7.6% of patients with acute PE, while PFO was found in 13%. Those who had a PFO had a greater rate of stroke than others who did not have a PFO (21.4 versus 5.5 percent; relative risk 3.5, 95 percent CI 1.62-8.67). Furthermore, nine individuals were removed from the study owing to inconclusive TTE or MRI testing, and the rate of PFO was lower (about 25 to 30 percent) than in the general population. Implying that the results are erroneous. Further research is needed before we can propose that individuals with acute PE who have no signs of stroke undergo contrast echocardiography or MRI imaging. As a result, we favor a symptom-directed strategy in which patients with acute PE must be monitored closely for neurologic symptoms, and the occurrence of a stroke must prompt a search for a PFO. It's also unclear if discovering a PFO with PE and stroke must result in indefinite anticoagulation and/or PFO closure, therefore a multi disciplinary approaches involving a neurologist, pulmonologist, and cardiologist is recommended. The treatment of stroke and PFO patients is covered individually (Meissner et al., 2006).

Late occurrences, which occur 3 month or later after a diagnosis of PE, vary from 9 - 32 , with % elevated mortality documented for up to 30 year (Ceauşu et al., 2013)

Recurring thromboembolism is less prevalent causes of late death than predisposing conditions. Here are several examples:

Mortality — A 5-year overall death rate of 32 percent was found in a retrospective analysis of 1023 individuals with PE (Ng et al., 2011).

Only 5% of those who died were due to PE, whereas 64% were due to non-cardiovascular reasons and 31% occurred due to cardiovascular reasons other than PE (eg, heart failure, MI and stroke). Patient in the prospective examination of PE diagnosis group were followed for a year and found similar results.

Another database research of over 128,000 patient with venous thromboembolism found that patients with PE had a three-fold higher death rate at 30 years than age- and gender controls who did not have PE over the same period (Chatterjee et al., 2014)

When compares to patient with proximal PE, combined data from 2 prospective trials of 748 patient with PE showed that they had similar rates of death (10 vs 7%) and recurrence (4 against 3%) at three month (den Exter et al., 2013).

Comorbidities such as cancer, advancing age, COPD, male gender, and HF had a major role in patient death.

Recurrence - It has been reported that the cumulative rate of late recurrent is 8% after six months, 13% after a year, 23% after five years, and 30% after ten years (Eichinger et al., 2014).

Recurrence rates varied depending on the population examined, although similar rates of proximal PE at three months have been documented (4 versus 3 percent). In general, however, therapeutic anticoagulation lowers the rate, whereas the presence of certain risk factors (e.g., unprovoked PE, malignancy) raises it, as addressed separately (den Exter et al., 2013).

CTEPH (chronic thromboembolic pulmonary hypertension) is an uncommon consequence of PE that usually manifests as increasing dyspnea within two years of the first incident. CTEPH's clinical signs and symptoms, as well as its diagnosis, are described individually.

Other - PE has been linked to an elevated risk of future cardiovascular disease and atrial fibrillation (Aidas et al., 2014)

Over the first year, most dyspnea patients' exercise ability and quality of life improve. Female sex, greater BMI, previous lung illness, and higher systolic pulmonary artery pressure on 10 days echocardiogram were all predictors of decreased improvement over time in a prospective trial of 100 patients with acute PE (Kahn et al., 2017).

The existence or absence of inciting risk factor at the time of diagnosis may influence the chance of complications and mortality from PE. Patients of unprovoked PE were much more prone to developing re - occurrence, CTEPH, malignancy, and cardiovascular events, according to a 3-year

observational study involving 308 patients with PE. Patient with provoked PE, on the other hand, had a greater risk of mortality over the 7 year study period (Frederikus A Klok et al., 2010).

2.20. Prognostic factors

In the sections below, poor prognostic variables in patient diagnosed with PE are reviewed (Hayıroğlu et al., 2018**).**

Shock and right ventricular dysfunction — In patients with PE, numerous clinical, radiologic, and laboratory indicators of right ventricular failure have been recognized as poor prognosticators.

●**Clinical – The presence of clinical shock**, in individuals diagnosed with PE, which is caused by severe RV failure, mortality is routinely predicted .

●**Radiologic (echocardiography and computed tomography pulmonary angiography [CTPA])** – RV insufficiency, as measured by echocardiogram or CT pulmonary angiography (CTPA), is linked to a higher risk of death, however we feel that echocardiography is more accurate than CTPA (Coutance et al., 2011).

• RV dysfunction was linked to a 2-fold increase in PE-related in-hospital mortality, according to a meta-analysis of seven trials involving 3394 normotensive and hypotensive patient with PE (ten Wolde et al., 2004).

Furthermore, in a subgroup of normotensive individuals, RV dysfunction on echocardiography or CT was shown to have a weak

correlation with death, emphasizing that symptomatic RV dysfunction is what predicted death.

•A greater pulmonary trunk diameter on CTPE was related with increased mortality during the treatment period of three to six months (OR 2.8, 95 percent CI 1.3-5.7) and at one year in a prospective multicenter trial of 1950 patients diagnosed and treated with PE (OR 2.3, 95 percent CI 1.4-4.0). There was no evidence of a link to right ventricular dysfunction (Grifoni et al., 2006).

Recurrent venous thromboembolism can be predicted by RV dysfunction (VTE). Patients with persistent RV dysfunction on echocardiography 3 month after diagnosis had a 4-fold rising risk of recurrent VTE when compared to patient without RV dysfunction or patient whose RV dysfunction resolved prior to discharge in one prospective observational study of 301 patient with PE (9 versus 3 and 1 percent patients-years) (Grifoni et al., 2006).

2.21 Pulmonary Embolism Severity Index (PESI) Score

The Pulmonary Embolism Severity Index (PESI) score aims to stratify patients with PE into classes of increasing rate of mortality and adverse outcomes (Dentali et al., 2013) .

2.22 Nursing Roles

A nurse's primary duty is to advocate for and care for patient, as well as to assist them through health and illness. But, a nurse's duty also

comprises a variety of additional tasks, such as: Record medical history and symptom (Bodenheimer & Bauer, 2016)**.**

- Work with teams to plan for patient care save an eye on the patient health and keep a record of their signs.

- Assist in the administration of drugs and therapies

- Be able to operate medical equipment

- Conduct diagnostic tests

- Inform patients on how to manage their diseases.

- Assist patients with information and guidance (Bodenheimer & Bauer, 2016).

2.22.1. Patient care

A nurse is a caregiver for a patient who helps with physical needs, illness prevention, and treatments. They should keep an eye on the patient and document any important information in order to make therapeutic recommendations (Bodenheimer & Bauer, 2016).

During the treatments process, the nurse keeps track of the patient progress and work in his or her best interests. Nursing responsibilities extend beyond the administration of medications and other treatment. They are responsible for the holistic treatment of patient, which encompasses their psychological, cultural, developmental, and spiritual needs.

2.22.2. Patient advocacy

The nurse's main priority is the patients. The nurse's job is to advocate for the patient best interests while also keeping the patient dignity during care and treatment. This might entail cooperating with other health experts to provide recommendations for patients' treatment plans.

This is particularly crucial since sick persons are sometimes unable to grasp medical condition and act normally. The nursing job is to always support and advocate for the patient best interests, particularly while treatments decisions are being made (Cole et al., 2014).

2.22.3. Planning of care

A nurse is intimately involved in the treatment of patient's decision-making process. When analyzing patients indicators and detecting possible issues, they must be capable to think critically in order to make appropriate suggestions and actions.

Nurse must be able to correctly convey facts about patient health to other health professional who are typically in charge of making final treatment choices. Nurse is the most connected with each patient condition since they monitor their sign or symptom on a daily basis, and they must work with other health care professional team to deliver the best possible health outcomes for patients (Dempsey et al., 2014).

2.22.4 Patient Education and Support

Nurse is responsible for confirming that people have the greatest possible understanding of their health, diseases, drugs, and treatments. When patient are discharged from the hospitals and must take care of their own treatment, this is critical.

When patients and their family or caregiver leaves the hospitals or medical clinic, a nurse must take time to explain what to do and what to expect. They must also confirm that the patients feel maintained and that they are alert of where they may get further information (Friberg et al., 2012).

2.23. Nursing role towered pulmonary embolism

- The nurse's primary responsibility is to identify patients who are at heightened hazard for PE and to reduce the risk of PE in all patient.
- All patients are assessed for thrombus development and pulmonary embolus risk factors.
- Examine your medical history to see if you have ever had a heart attack or stroke.
- Ask about any family history of cardiovascular illness, since this may expose the patient to PE.
- A record of your drugs (There are some medication that may increase the risk for PE) (York et al., 2015).
- A physical examination. redness, Warmth, and inflammation are assessed in the extremities

- A patient's plan and objectives
- Nursing Interventions The following are examples of nursing care for a patient with pulmonary embolism:

  a. Keep venous stasis at bay. To avoid venous stasis, encourage ambulation and vigorous and passive leg workouts.

  b. Keep an eye on the thrombolytic treatment. INR or PTT are used to track thrombolytic and anticoagulant treatment.

  c. Relieve pain. To enhance the ventilation-perfusion ratio, turn and reposition the patient regularly.

  d. Keep track of oxygen treatment. Examine for indications of hypoxia and keep an eye on the pulse oximetry readings.

  e. Assist in the reduction of anxiety. Assist the client to express any thoughts or concerns he or she may have regarding this terrifying event (Amiri et al., 2019).

Evaluation

The following criteria will be used to assess the treatment plan's success:

a. Better perfusion.

b. Verbalized knowledge of the illness, treatment plan, and drug adverse effects.

c. Hemodynamic stability was demonstrated.

d. Pain is alleviated or managed, as reported.

e.   Adhered to the pharmaceutical regimen advised.(Kline & Kabrhel, 2015)

Advise on how to avoid pulmonary embolisms in the long term for patient:

a. Maintain a healthy level of activity by exercising on a regular basis.

b. If you need to sit or stand for lengthy periods, use elastic compression stockings.

c. Take anticoagulants (blood thinners) as directed by doctor. Consult a doctor whether a temporary adjustment in dose is necessary when you become conscious of times when you will have limited mobility, such as during surgery or prolonged bed rest.

d. On long aircraft or automobile rides, take a walk or flex and stretch your legs every hour.

e. If can't walk because you're in bed, recovering from surgery, or traveling for a lengthy period of time, exercise arms, legs, and feet for a few minute every hour.

f. Drink lots of water and juices, and stay away from too much alcohol and caffeine.

g. Don't   smoke.

h. Maintain a healthy body weight (Gates et al., 2012).

2.24. Previous studies

First study

(Najm et al., 2020) This study was conducted to assess the nurses' knowledge about pulmonary embolism Methodology: A descriptive design study was carried out for the period of November18th 2018 up to the 20th of April 2019. Anon-probability (purposive) samples of (60) a nurse work at respiratory care unit in Baghdad Teaching Hospitals from different educational levels, both sexes (males and females), were selected. The questionnaire tool consist of two parts, First part consist of (6) items included, age, gender, level of education, number of years of employment in hospital, number of experience in the respiratory care unit and training course about pulmonary embolism.& second part consist of (4) domains which included Nurses knowledge concerning definition and causes of disease, signs and symptoms, diagnostic test ,treatment of pulmonary embolism. The data have been analyzed through the application of: descriptive and the inferential analysis and the researcher used the SPSS version 20 to analysis of data. Conclusion: The study recommend that the critical care nurse have moderate level of knowledge and there were significant association between level of education and the nurse knowledge at $p > 0.05$ level.

Second study

(Mahdi & Mansour, 2021) This study was conducted to assess nurses` knowledge toward preventive measures of pulmonary embolism, and determine the relationship between nurses knowledge and their

socio-demographic data. Methods: A descriptive study is conducted for the periods of 26th November 2020 to 2ed May 2021. The study is carried out at AL-Hussein Teaching Hospital and AL-Haboby Teaching Hospital in AL Nasiriyah City. A purposive sample (non-probability) consisting of (60) nurses was selected from nurses who work in the critical care units and surgical wards. Results: Findings indicate that nurses age at mean 27.2, (80%) females, (40%), secondary nursing school graduated, (71.7%) have 1-5 years of experience and no participated in training sessions. Findings demonstrated that the nurses were poorly knowledge related to pulmonary embolism and preventive measure of pulmonary embolism at mean equal to 0.30, and 0.27 respectively. There were no-significant relationship between nurses knowledge and their demographic data at p-value >0.05.CONCLUSIONS: Nurses working in critical care units and surgical wards expressed poor knowledge toward preventive measures of pulmonary embolism due to low level of education and lack of training. Recommendations: The study recommended the necessity of allocating special training courses for all nurses who work in critical care units and surgical wards to improve the knowledge of nurses toward preventive measure of pulmonary embolism, in addition to increasing the number of professional nurses' graduate from the colleges of nursing to the enrolled in surgical wards.

Third study

(Haza'a et al., 2020) This study was conducted to investigate the effect of an educational program on critical care nurses' performance regarding pulmonary embolism emergency care. A Quasi-experimental

design was utilized in this study. This study was carried out in the medical, surgical and emergency Intensive Care Unit at Al-Thawra Modern General Hospital Authority in Sanaa – Yemen. The sample of this study consisted of 75 nurses' for implementing the program. Tools utilized for data collection were the nursing questionnaire and observation checklist. The results There were statistically significant differences (P<0.000) in the total nurses, knowledge scores regarding emergency care for a patient with pulmonary embolism, pre-implementation of the program compared with the immediately post-implementation and post three months follow up. There were statistically significant differences (P<0.000) in total nurses, practice scores regarding emergency care for patient with pulmonary embolism pre-implementation compared with the immediately post-implementation and post three months follow up. Conclusion: There was a statistically significant difference between the nurse knowledge and practice in pre/post and follow up implementing of the educational program.

Forth study

(Haza'a et al., n.d.) This study was conducted to evaluate effect of an educational program on nurses' knowledge and practice regarding complication of pulmonary embolism. A quasi-experimental research design with pre and post-test assessment was used on 75 participants of nurses working in the medical, surgical and emergency ICU at AlThawra Modern General Hospital Authority in Sanaa - Yemen. Tools utilized for data collection were nursing questionnaire sheet was used to assess nurses' knowledge, an observation checklist for their practice. The results showed marked deficiencies in nurses' knowledge and practices before the program, with statistical significant differences improvements at the post and follow-

up evaluations (P<0.000) Conclusion: there was statistical significant difference between the nurse knowledge and practice in pre/post and follow up implementing the program. Therefore, a relatively short-term in service training programs for all nurses working in the medical, surgical and emergency ICU department is implemented to enable nurses to update their knowledge and practice.

Fifth study

(Xu et al., 2020) This study was conducted to investigate the cognition of nurses on the control and treatment of venous thromboembolism in China, thereby providing suitable countermeasures for clinical venous thromboembolism prophylaxis and treatment. In December 2019, 1121 registered nurses from a university-affiliated hospital were selected to answer the self-designed and electronic questionnaire which was designed to evaluate the nurses' knowledge (21 items), attitudes (6 items), and behaviors (9 items) toward venous thromboembolism prophylaxis. Descriptive, correlation, and regression analyses were conducted for data analysis.

Of the included 1121 nurses, only 55.43% nurses selected 100% correct answer. The influencing factors of knowledge included the department, education, professional ranks, and venous thromboembolism nursing experience. The nurses from ICU department gained the highest score, but the nurses from pediatrics department obtained the lowest score. The nurses with higher education level and professional ranks, and nursing experiences achieved higher scores. The total positive response rate for the attitude-related items was 68.54%. Nurses were primarily concerned about

the financial penalty due to the inability to complete the work (49.0%). An increasing workload is the second primary concern of nurses (40.8%). The increasing medical cost, extension of hospital stay, and exacerbation of doctor–patient conflicts were the most serious difficulties involved in venous thromboembolism prophylaxis. The total correct score rate for the behaviors was 56.19%. Nearly half of the nurses could not offer advice for venous thromboembolism patients. The nursing experience, department, and years of work were related to the scores of knowledge-related items (all $P < 0.05$). The overall knowledge level of the nurses was not optimistic. Although their general attitude toward venous thromboembolism prophylaxis was positive, their behaviors were influenced by many factors. Administrators should, therefore, make countermeasures to deal with these problems.
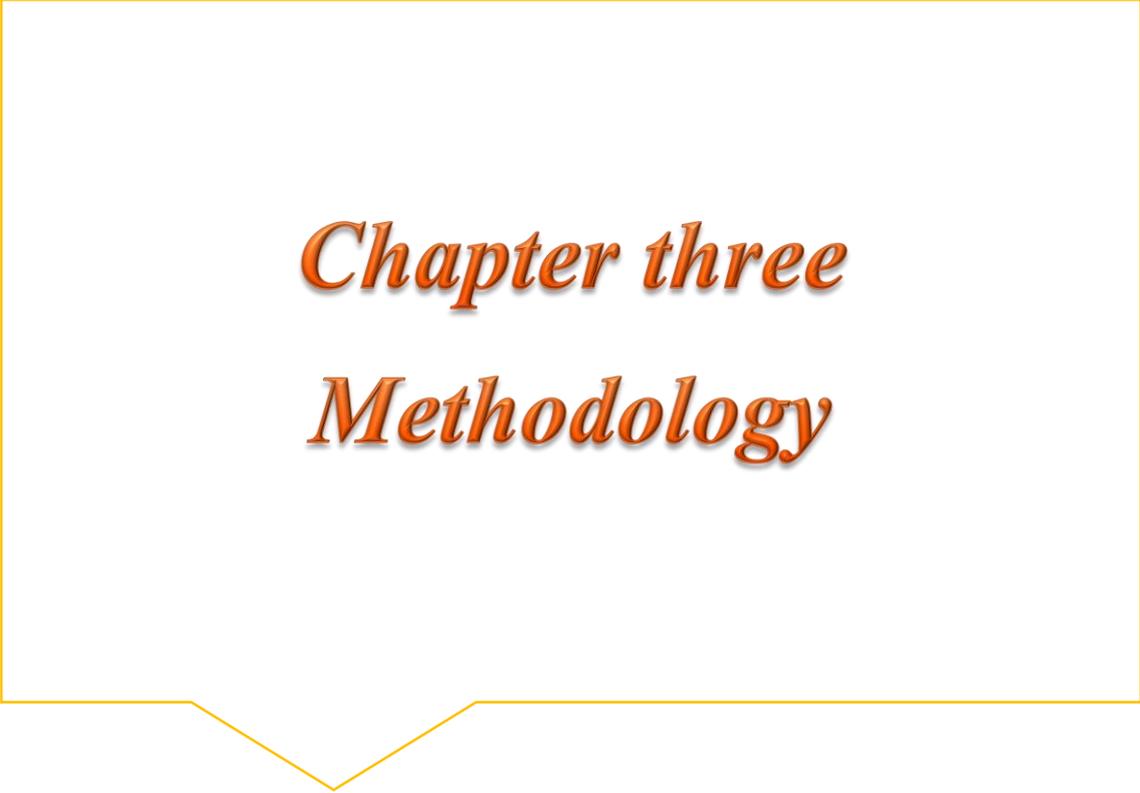
Chapter three

Methodology

Chapter Three

METHODOLOGY

This chapter is concerned with the presentation of all the methodological principle, which is conduct systematically to accomplish the aims of this study.

3.1. Study Design

A cross sectional study design was carried out in Al-Hilla Teaching Hospitals; the study was conducted on groups of nurses in the different areas of the hospital (critical care units) to identify their levels of knowledge about pulmonary embolism disease. The research conducted between the period from 20 September 2020 to 1st Jun 2021.

3.2. Administrative Agreements

The formal administrative agreements have been achieved before data collection, which required for conducting the study are presented in Appendix (A) as follows:

1. The formal permission should be received from the higher education committee / College of the Nursing / University of Babylon after the presentation of the first seminar and the Council of the University of Babylon afterward at 27 Sep 2021.

2. An Approval Scientific of Ethical Research Committee of the Department of Adult Nursing at Babylon University / College of Nursing has approved the protocol of the study at 23 Feb 2021.

3. An official agreement was attained from the department of developing and training/Babylon Health Directorate/Ministry of Health at 11march2021.

3.3. Study Setting

The research was carried out in the critical care units of Imam Al Sadiq Teaching Hospital, Al Hilla General Teaching Hospital and Marjan Hospitals.

3.4 Target Population

The population in current study consisted of nurses who working in the critical care units at Al-Hilla Teaching Hospitals.

3.5 sample of the study

The sample consisted of (112) participants selected in Use of a non-probability sampling method, including nurses working in Critical care units at Imam Al Sadiq Teaching Hospital which include 43 nurse working in intensive care unit (ICU) and 21 nurses who working in cardiac care unit (CCU), Al Hilla General Hospital that's include 26 nurses working in intensive care unit, and Marjan Hospitals include 22 nurses who working in cardiac care unit.

3.5.1. Inclusion Criteria:

The inclusion criteria were the selection of the nurses who have been working in the critical Care Unit (ICU, CCU) and they were available at the time of data collection.

3.5.2. Exclusion criteria of the sample

The study excludes the following sample:

- The nurse who did not complete the questionnaire in full.
- Excluded other specialties working in the nursing field such as midwifery.
- The nurse who refused to participate in the study.
- The nurse who participated in the pilot study

3.6. The tools of the study:

The study questionnaire was a questionnaire designed to collect data, constructed and adapted to the sample collection, and validated. The questionnaire was divided into two parts that contain 44 items as follows:

Part I: socio-demographic characteristics of critical care nurses, which include eight items as follows:

Gender, Age, Marital status, Level of education, Workplace (department name), The number of year of experiences in the nursing field, The number of years of experiences in critical care units, Training courses related to pulmonary embolism.

Part II: Nurses' knowledge toward pulmonary embolism divided into 4 domain

The first domain: is an assessment of nurses' knowledge regarding pulmonary embolism, causes, and risk factors, it contains 16 items.

The second domain: is an assessment of nurses' knowledge of signs and symptoms and the diagnostic test of pulmonary embolism includes 13 items

The third domain: assessment of nurses' knowledge toward nursing care and treatment for patients with pulmonary embolism includes 13 items.

The fourth domain is the assessment of nurses 'knowledge toward complications of pulmonary embolism, including two items.

3.7. Validity of the questionnaire

the content quality of the questionnaire was assessed by (9) experts (3) teaching staff of the Babylon, (3) teaching staff of Baghdad, (1) teaching staff of Al-Kufa , (2) teaching and teaching staff of the Karbala faculties of nursing universities . The Professional Team who valued the questionnaire's

arbitration The results of the experts 'revisions to the method showed that they all agreed on it, except minor differences, and that some item was omitted with respect to the expert's proposal, if the calculation of the underlying phenomenon is transparent and acceptable, then the last draft is ready to be handled.

3.8. Pilot Study

A pilot study has been carried out during 1 week of January (4th to 11th 2021) at AL- imam Al- Sadiq and Al Hilla Teaching Hospitals. The pilot sample that was taken composed of (10) nurses who are working in the critical care units from which the initial test group was omitted since certain adjustments were made to improve the questionnaire.

The objectives of this preliminary work was to focus on the following:

1) Reliability of the questionnaire.

2) Estimation of the time required for the data collection.

3) Identification of the barriers that may be uncounted during the data collection.

4) Identification of the clarity and adequacy of the study item.

The result of the pilot study:

1) The questionnaire is reliable.

2) The questionnaire's items are clear and can be understood easily.

3) The period required to complete the questionnaire's questions ranged from (15-20) minutes.

3.9. Reliability of the Questionnaire:

Data were gathered out of (10) nurses is selected among those who are work at AL- imam Al- Sadiq and Al Hilla Teaching Hospitals. Reliability investigating was used as a statistical analysis method to determine the concordance among the items of the questionnaire using the reliability coefficient. The questionnaire had an acceptable level of inside consistency and determining by a Cronbach's alpha and shown below:

Table 1: Reliability of the studied questionnaire

N. item	Reliability techniques	Actual values	Acceptable value	Assessment
Knowledge (44 item	Alpha (Cronbach)	0.81	0.70	pass

The questionnaire is reliable. The time required for answering the questionnaire ranged from (15-20) minutes. The questionnaire items were clarified and understood the phenomenon of knowledge about pulmonary embolism among nurses on the same society at any time in the future.

3.10. Methods of Statistic

The SPSS version 20 and Microsoft Excel (2010) were used to analyze the collected data of the study:

3.10.1.Descriptive approach

A. Statistical tables "Frequency and percentage " which are:

$$\% = \frac{Frequency}{Sample\ Size}\ x100$$

B. Mean of score "MS".

The average score can be calculated by using the following:

$$M.S = \frac{\sum ri = 1Fi \times Si}{\sum ri = 1Fi} \, x100$$

$\sum xi$ = sum of the (*1x Incorrect + 2x Correct*) for items.

(1) Average score 1-1.33) is considered **Poor Knowledge**.

(2) Average score = (1.34-1.67) is **Moderate Knowledge.**

(3) Average score = ($\geq$1.68) is **Good Knowledge.**

C. The test of standard deviation "S.d.).

$$\text{Standard deviation} = \sqrt{\frac{\sum(X - \bar{X})^2}{n-1}}$$

D. It uses a correlational coefficient "Cronbach alpha" used in estimating the internal consistency of the study tool, which can be calculated by using the following:

$$\alpha = \frac{K}{K-1}\left[1 - \frac{\sum_{i=1}^{K} \sigma_{ii}}{\sum_{i=1}^{K}\sum_{j=1}^{K} \sigma_{ij}}\right]$$

K is the item numbers "question" and σ_{ij} is the investigate covariance's between the item i and j. Note the σ_{ii} is the variances "not S.d " of items i.

3.10. 2.Inferential approach

Chi-Squared Test

To check the different between the number of nominal standard of random variable dichotomous as "Nurses Knowledge and demographic characteristics".

$$\chi^2 = \frac{\sum_{all\ i}(O_i - E_i)^2}{E_i}$$

chi-squared= " X^2 "

sum ="$\sum$"

"Where O_i is the observe frequencies of groups i and E_i is the expected frequencies".

They $\chi^2 obs. < \chi^2$ crit. = not significant ly.

They $\chi^2 obs. > \chi^2$ crit. = significance,

As compared with the D.f.

Value for measuring important compared to the level, are used as follows:

(1) **NS**: *Non significance at probability-value>0.05.*

(2) **S** : *Significance at probability-value <0.05.*

(3) **HS**: *High significance at probability-value <0.01.*
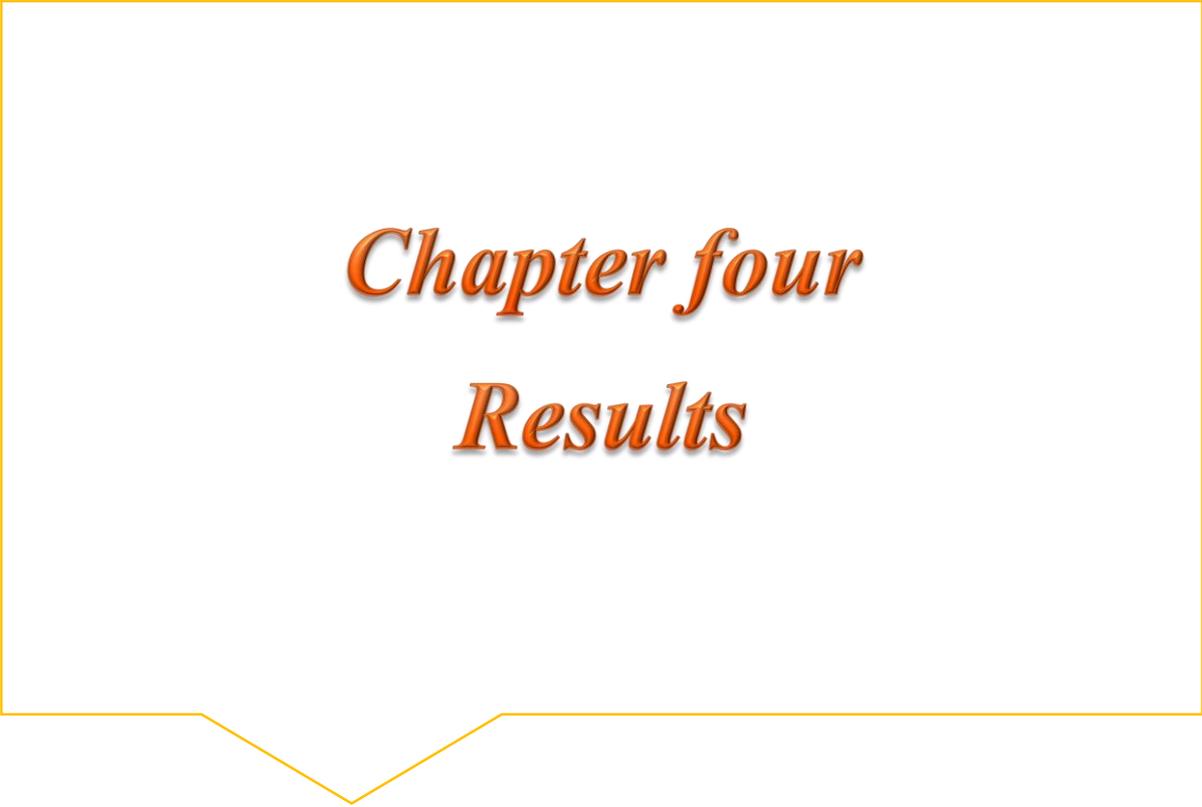
Chapter four
Results

Chapter Four

RESULTS

This chapter systematically presents the findings of data analysis in table and these refer to the aims of this report, which are as follows:

4-1. Descriptive Statistic of Nurses Demographic Variables

Demographic Variables	Rating	F=112	%
Age/years	20-29	93	83.0
	30-39	11	9.8
	40-49	5	4.5
	50 and older	3	2.7
	Total	112	100.0
	Mean± S.d= 27±5.58		
Gender	Male	67	59.8
	Female	45	40.2
	Total	112	100.0
Educational attainment	Secondary school nursing	27	24.1
	Diploma nursing	64	57.1
	Bachelor nursing	21	18.8
	Total	112	100.0
Workplace	ICU	60	53.6
	CCU	27	24.1
	RCU	25	22.3
	Total	112	100.0
Years of Experience in nursing	<5	92	82.1
	5-10	17	15.2
	>10	3	2.7
	Total	112	100.0
Years of experience critical care unit	<1year	59	52.7
	1-5years	50	44.6
	>5years	3	2.7
	Total	112	100.0
Training Sessions	No trained	88	78.6
	Trained	24	21.4
	Total	112	100.0

F=Frequency, %=Percentage

This table represents the descriptive statistics of socio-demographic information of the nurses in term of frequencies and percentage. Out of (112) nurses participating in current study, their age ranged between 20-29 year old and made up (83.0 percent) of the total number of participants.

In terms of gender, male nurses were predominant and made up more than half in compared with female; it composes (59.8%).

It is clear from the findings that more than half of the study sample were diplomas graduated, it reflected (57.1 percent) out total number, with an approximately similar percentage (40.2%) were Bachelor graduated.

The findings show the distribution of the studied sample according to workplace, results show that most of the participants in the study (53.6 percent) work in intensive care unit (ICU).

In regards with experience, most of them have less than 5 years as a experience in their nursing job and in less than one year in critical care unit, which composed of (82.1 and 52.7 percent) respectively.

Finally, the majority of the study participants were not attend training sessions and constituted (78.6 percent).

4.2. Assessment of Nurses Knowledge related to Pulmonary Embolism Disease

Table 4-2-1: Nurses Knowledge related to Definition, Causes and Risk Factors of Disease

List	Definition, Causes and Risk Factors Items	M.s.	S.d.	Ass.
1	Pulmonary embolism is a …….. of a central blood vessel in the arteries of the lungs?	1.68	0.469	Good
2	What is pulmonary embolism?	1.68	0.469	Good
3	What is the most recurrent causes of pulmonary embolism?	1.60	0.492	Moderate
4	One of the choice is not causes of pulmonary embolism?	1.43	0.497	Moderate
5	Hemoptysis is ?	1.42	0.496	Moderate
6	An imbalance between the supply of blood and the supply of air to the lungs is called ?	1.53	0.502	Moderate
7	The most common site of origination of pulmonary embolisms (PE)	1.38	0.486	Moderate
8	There are several causes of pulmonary embolism, the most common is ?	1.43	0.497	Moderate
9	There are several risk factors for pulmonary embolism, except ?	1.27	0.445	Poor
10	One of the following is increased risk of pulmonary embolism?	1.29	0.458	Poor
11	When works with female who are taking hormonal birth regulator, what health education measure should the nurses ?	1.29	0.458	Poor
12	Having a pulmonary embolism includes risk of possible?	1.29	0.458	Poor
13	Who is at greater risk for pulmonary embolism?	1.33	0.472	Poor
14	Which of the following is not a reason or risk factor for PE?	1.26	0.440	Poor
15	A nurses are care for four patients on IV heparin therapy. Which lab value possibly indicate that?	1.36	0.481	Poor
16	What is a normal platelet count value?	1.23	0.424	Poor

this table demonstrated that the nurses knowledge about definition, causes and risk factors of pulmonary embolism were good responses at

items number (1 and 2) and items number (3, 4, 5, 6, 7 and 8) the responses were moderate knowledge, and the remaining items were poor knowledge.
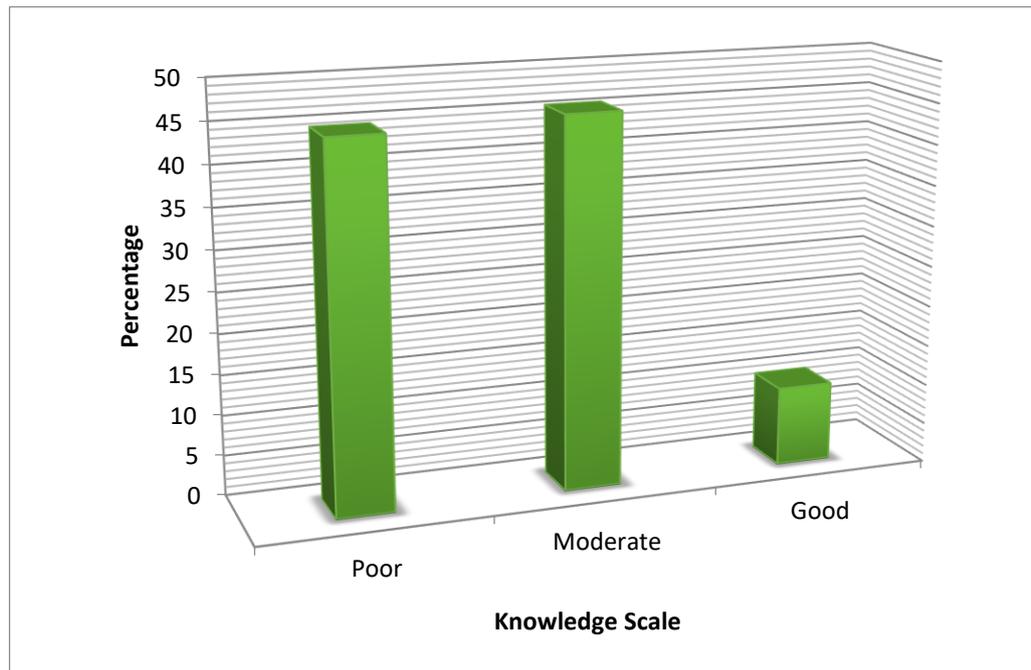
Figure 4-2-1: Nurses Knowledge related to Definition, Causes and Risk Factors of Pulmonary Embolism

Overall, the findings indicate that the majority (45.5%) of nurses had moderate knowledge related to definition, causes and risk factors of pulmonary embolism (Fig. 4-2-1).

Table 4-2-2: Nurses Knowledge related to Signs & Symptoms and Diagnostic test of Pulmonary Embolism

List	S&S and Diagnostic test Items	M.s.	S.d.	Ass.
1	When a PE occurs, which of the following are appear?	1.38	0.486	Moderate
2	Which of the following signs are not characteristics for pulmonary embolism ?	1.22	0.418	Poor
3	A clients have experienced PE. The nurses should assess for which symptoms, which are most common?	1.38	0.489	Moderate
4	A 67-yeasr-old patients with dyspnea come in to the ED. The patients have a former history of bladder cancer, he has swollen left leg,…	1.35	0.479	Moderate
5	All the following symptoms of PE , except?	1.31	0.466	Poor

6	Sign and symptom of a PE depend on ?	1.23	0.424	Poor
7	Signs and symptoms of pulmonary embolism (PE) can include?	1.21	0.412	Poor
8	In diagnosing pulmonary embolism which of the following signs is most reliable	1.14	0.351	Poor
9	clients are admit with a (PE). The clients are early age, healthy, and actives and have no known risky factor?	1.11	0.311	Poor
10	There are several signs and symptoms that are expected to be found in a patient suffering from embolism ?	1.17	0.377	Poor
11	A clients have a(PE) and is started on o_2. The student nurses asks why the clients o_2?	1.21	0.412	Poor
12	A nurses are assisting the health-care providers who are intubating clients. The providers has been attempting to ?	1.21	0.406	Poor
13	An intubated client oxygen saturation has dropped to 88%. What action by the nurses taken priority?	1.14	0.351	Poor

In the light of statistical cut off point, findings illustrated that the nurses knowledge about signs & symptom and diagnostic test of pulmonary embolism were poor at all items of the scale except, items number (1, 3 and 4) the responses were moderate knowledge
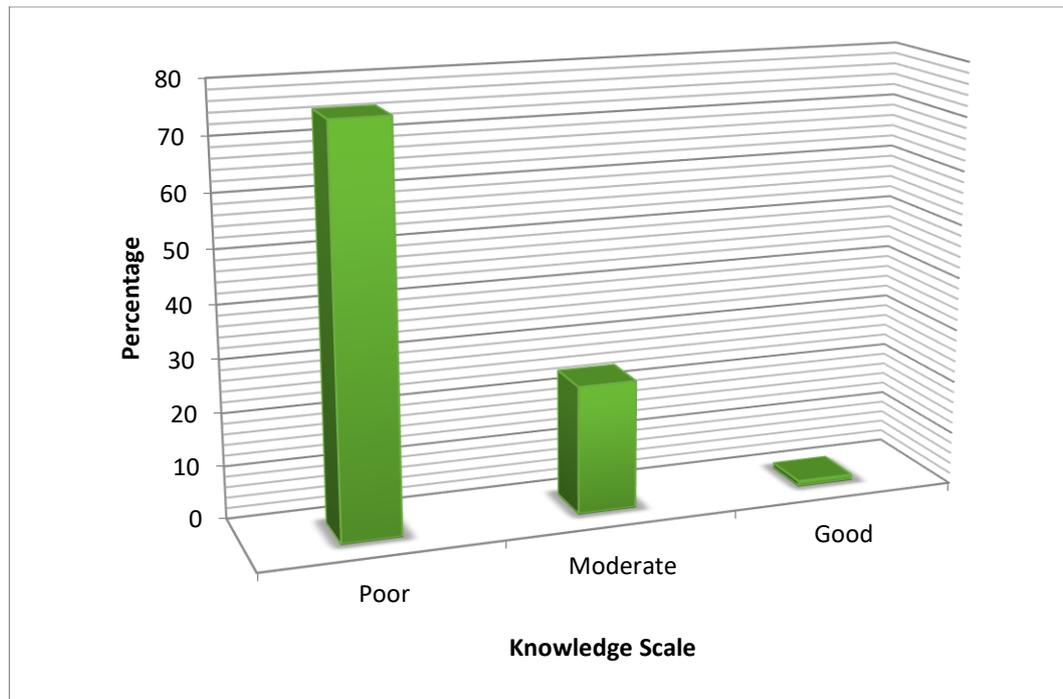
Figure 4-2-2: Nurses Knowledge related to Signs & Symptoms and Diagnostic test of Pulmonary Embolism
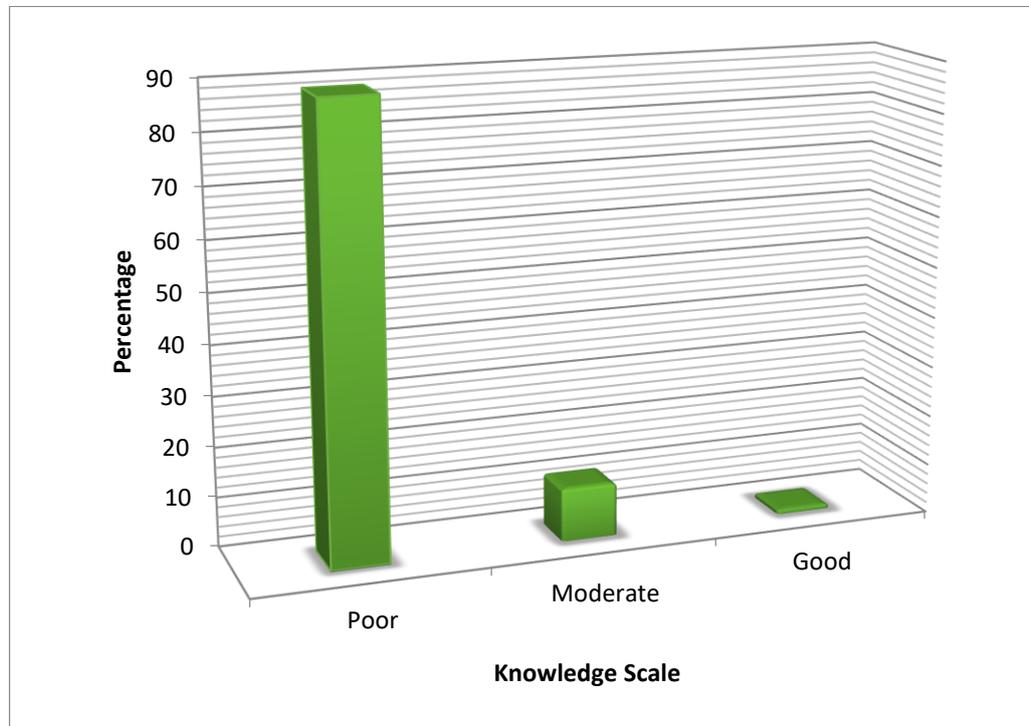
Overall, the findings showed that the majority (75.0 %) of nurses were poor knowledge related to signs & symptoms and diagnostic test of pulmonary embolism (Fig. 4-2-2).

Table 4-2-3: Nurses Knowledge related to Treatment and Nurses Care Plan of Pulmonary Embolism

List	Treatment Items	M.s.	S.d.	Ass.
1	What is the medication which treat the pulmonary embolism?	1.25	0.435	Poor
2	A nurse planning to administer Alteplase (activase) treatment to a patient showing symptoms of pulmonary embolism	1.07	0.259	Poor
	Nurses Care Items	**M.s.**	**S.d.**	**Ass.**
3	Impaired Gas Exchange in PE May be related to ?	1.23	0.424	Poor
4	Unsuccessful respiration Pattern May be due to Anxiety and fear, Chest pain and Hypoxia	1.17	0.377	Poor
5	A clients have been diagnosed with a very large (PE) and has a dropping BP blood.	1.26	0.440	Poor
6	One patient was diagnosed with very large pulmonary embolism and had hypotension.?	1.25	0.435	Poor
7	A 25-year-old woman complains of shortness of breath after 10 hours of air travel?	1.18	0.385	Poor
8	A patient entered the emergency ward showing signs of shortness of breath, but the oxygen reading is 97% ?	1.12	0.322	Poor
9	A nurses caring for a patient who have a new prescription for heparin. Which of the following statements is?	1.20	0.399	Poor
10	The patient with pulmonary embolism is in the intensive care unit. What assessment data require the immediate intervention …?	1.13	0.342	Poor
11	The patient was admitted to his internal ward and was diagnosed with a pulmonary embolism. What intervention should ?	1.13	0.342	Poor.
12	The nurse identified the patient's problem with the "decreased cardiac output" of the patient with a pulmonary embolism?	1.11	0.311	Poor

This table presents the mean analysis for assessing the nurses knowledge about treatment and nursing care plan; the statistically cut-off

point indicate that the nurses are showing poor level of knowledge among all items of the scale.

Figure 4-2-3: Nurses Knowledge related to Treatment and Nursing Care Plan of Pulmonary Embolism

Overall, the findings indicate that the majority (88.4 %) of nurses were poor knowledge related to treatment and nursing care plan of pulmonary embolism (Fig. 4-2-3).

Table 4-2-4: Nurses Knowledge related to Complication   of Pulmonary Embolism

List	Complication Items	M.s.	S.d.	Ass.
1	The nurse is caring for a patient who had an pulmonary embolism. Then the patient chest manifestation indicates a complication?	1.14	0.351	Poor
2	A 72-year-old patient underwent a hip replacement operation. When evaluating the patient after the operation ?	1.13	0.332	Poor

This table presents the mean analysis for assessing the nurses knowledge about complication of pulmonary embolism; the statistical cut-off point indicate that nurses are showing poor level of knowledge among all items of the scale.

Overall, the findings indicate that the majority (75.9%) of nurses were poor knowledge related to complication of pulmonary embolism (Fig. 4-2-4).
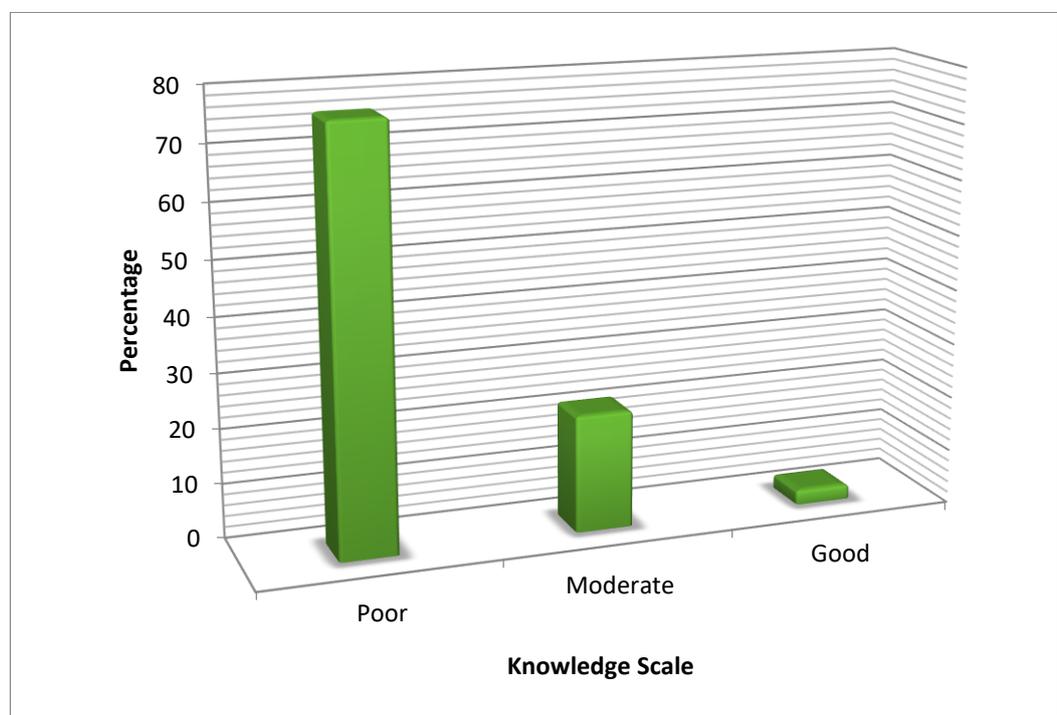
Figure 4-2-4: Nurses Knowledge related to Complication of Pulmonary Embolism.

Table 4-2-5:Summary of Statistic Nurses Knowledge towards Pulmonary Embolism

List	Domains	N	S.d.	M.s.	Ass.
1	Knowledge related to Definition, Causes and Risk Factors of Disease	112	0.653	1.65	Moderate Knowledge
2	Knowledge related to Signs & Symptoms and Diagnostic test of Pulmonary Embolism	112	0.4600	1.25	Poor Knowledge
3	Knowledge related to Treatment and Nurses Care Plan of Pulmonary Embolism	112	0.358	1.12	Poor Knowledge
4	Knowledge related to Complication of Pulmonary Embolism	112	0.501	1.26	Poor Knowledge
Overall knowledge related to Pulmonary Embolism		112	0.450	1.24	**Poor Knowledge**

This table shows the statistically distribution and knowledge about pulmonary embolism main domains. The findings revealed the nurses knowledge towards definition, causes, risks factors of pulmonary embolism were moderate knowledge. While, knowledge in terms of signs & symptoms, diagnostic test, treatment, nursing care plan and complication, the nurses showed poor level of knowledge. The overall knowledge were poor level at low level of mean+ S.d.= 1.24+0.450 as shown in figure (4-2-5).
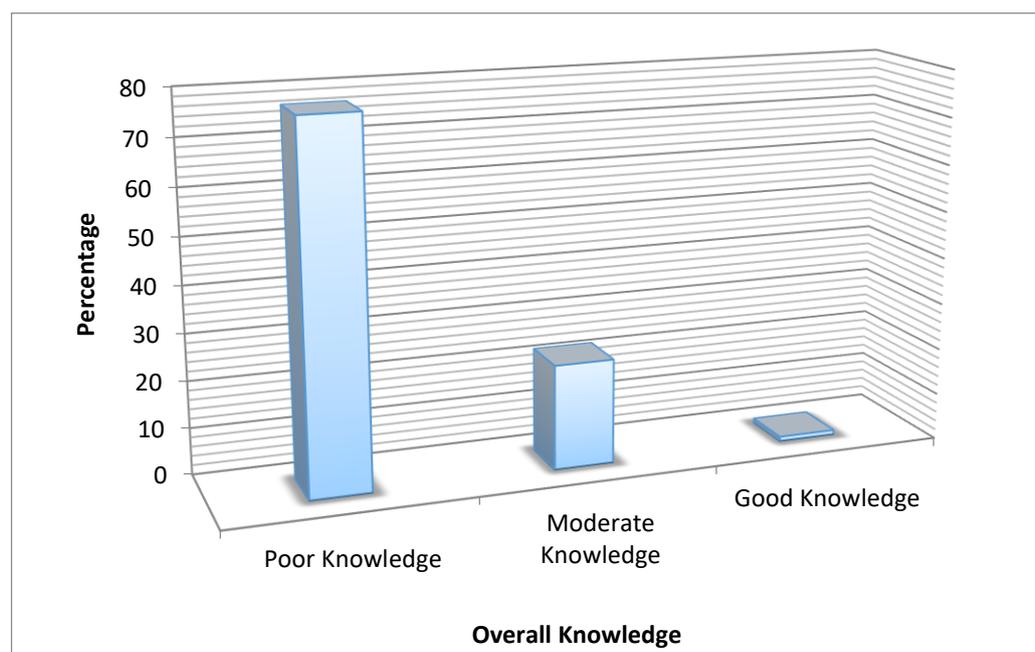
Figure 4-2-5: Overall Assessment of Nurses Knowledge

4.4. Relationships between Nurses Knowledge towards Pulmonary Embolism and Socio-demographic Characteristics

Table 4-4-1: Relationship between Nurses Knowledge and their Age

	Rating	Knowledge			Total	d.f	Sig.	
		Poor	Moderate	Good				
Age	20-29years old	72	21	0	93	6	χ^2obs.= 10.457 χ^2 crit.= 12.592 P-value=0.107	NS
	30-39years old	7	3	1	11			
	40-49years old	4	1	0	5			
	50 and older	3	0	0	3			
	Total	86	25	1	112			

Findings were indicated that age groups of nurses were not significant with their knowledge towards pulmonary embolism at *p-value >0.05*.

Table 4-4-2:Relatinship between Samples Knowledge and Gender

	Rating	Knowledge			Total	d.f	Sig.	
		Poor	Moderate	Good				
Gender	Male	52	15	0	67	2	χ^2obs.= 1.504 χ^2 crit.= 5.991 P-value=0.471	NS
	Female	34	10	1	45			
	Total	86	25	1	112			

Findings were indicated that nurses gender were not significant with their knowledge towards pulmonary embolism at *p-value >0.05*.

Table 4-4-3:Relatinship between Samples Knowledge and Educational Attainment

	Rating	Knowledge			Total	d.f	Sig.	
		Poor	Moderate	Good				
Education	School nursing	27	0	0	27	4	χ^2obs.= 86.414 χ^2 crit.= 9.488 P-value=0.000	HS
	Diploma nursing	59	5	0	64			
	Bachelor nursing	0	20	1	21			
	Total	86	25	1	112			

Findings display that educational attainment of nurses were highly significant with their knowledge towards pulmonary embolism at *p-value <0.01*.

Table 4-4-4:Relatinship between Samples Knowledge and Workplace

	Rating	Knowledge			Total	d.f	Sig.	
		Poor	Moderate	Good				
Workplace	ICU	48	11	1	60	4	χ^2obs.= 3.296 χ^2 crit.= 9.488 P-value=0.510	NS
	CCU	18	9	0	27			
	RCU	20	5	0	25			
	Total	86	25	1	112			

Findings demonstration that work unit of nurses were not significant with their knowledge towards pulmonary embolism at *p-value >0.05*.

Table 4-4-5: Relationship between Samples Knowledge and Years of Experience

	Rating	Knowledge			Total	d.f	Sig.	
		Poor	Moderate	Good				
Years of Experience	<5 years	71	21	0	92	4	χ^2obs.= 6.577 χ^2 crit.= 9.488 P-value=0.160	NS
	5-10 years	12	4	1	17			
	>10 years	3	0	0	3			
	Total	86	25	1	112			

Findings indicate that years of employment of nurses were not significant with their knowledge towards pulmonary embolism at *p-value >0.05*.

Table 4-4-6: Relationship between Knowledge and Experience in Critical Care Unit

	Rating	Knowledge			Total	d.f	Sig.	
		Poor	Moderate	Good				
Experience in CCU	<1year	50	9	0	59	4	χ^2obs.= 43.958 χ^2 crit.= 9.488 P-value=0.000	HS
	1-5years	36	14	0	50			
	>5years	0	2	1	3			
	Total	86	25	1	112			

Findings illustration that experience in critical care unit of nurses were highly significant with their knowledge towards pulmonary embolism at *p-value <0.01*.

Table 4-4-7:Relatinship between Samples Knowledge and Training Sessions

Training Sessions	Rating	Knowledge			Total	d.f	*Sig.*	
		Poor	Moderate	Good				
	No trained	72	16	0	88		χ^2obs.= 8.174	
	Trained	14	9	1	24	2	χ^2 crit.= 5.991	S
	Total	86	25	1	112		p-value=0.017	

Findings were indicated that training sessions of nurses were significant with their knowledge towards pulmonary embolism at *p-value <0.05*.

Chapter five

Discussion

Chapter Five

DISCUSSION OF STUDY RESULTS

This chapter presents the discussion of the implications of data gathered and reported in chapter four, their relevance was identified in relations with literature as well as the findings of the study concerning the knowledge related pulmonary embolism among nurses.

5.1.Demographic Variables for Nurses

Findings in table (1) out of (112) nurses participating in present study, their ages ranged between 20 to 29 year old and made up (83.0 percent) of the participants total numbers of nurses, this result come because that majority of the they dealing directly with the patient is from those with this age groups. Because the participants action with the patient requires a high physical activity and the who is advanced age fail to dealing with the patient. This findings come in the same line with findings from Cairo University Hospitals. Illustrated findings confirmed that critical care nurses were within age 20-30 years due to those areas need young workers (Ali, 2013).

In terms of gender, male nurses were predominant and made up more than half in compared with female, it composes (59.8%), due to the condition of the nursing job, male nurses were accounted for most of the nursing members , and all nurses who work in critical care unit need to be young to cover all duties in this units. In addition, this may be due to the fact that males cover night duties while females does not. These findings come with study conducted in Bagdad Teaching hospitals. Illustrated findings depict (57%) of nurses were male aged 26-30 years old (Mohammed et al., 2017).

It is clear from the findings that more than half of the study sample were diplomas graduated, it reflected (57.1 percent) out total number, with a percentage (18.8 %) were Bachelor graduated, as being the diploma certification was considered the major part of staff nurses in health organizations, due to the large number of institutions that graduate such degrees. This finding is similar to findings showed that most of nurses deals with patients with deep vein thrombosis were diploma graduated (Boulton et al., 2015).

The findings show the distribution of the studied sample according to workplace, results show that most of the participants in the study (53.6 percent) work in intensive care unit (ICU). According to the hospital's policy and distribution, as these wards need a large number of nurses.

In regards with experience, most of them have less than 5 years as a experience in their nursing job and in less than one year in critical care unit, which composed of (82.1 and 52.7 percent) respectively. The few years of nursing experience in critical care unit could be explained by the fact that have a frequent rotating from one unit to another within the hospital. This come agree with findings showed majority of nurses (90.6%) were diploma of nurses. And (56.3%) of the nurses have an experience less than 5 years, while not only of the study group had a relative training courses (Chatterjee et al., 2014). As well as, findings come with findings of Ali (2013), who stated in their findings that critical care nurses were have less than one year in their workplace due to frequent rotation

The majority of the study participants were not attend training sessions and constituted (78.6 percent). The participation in a training sessions is diminished due to the lack of an effective role in the continuing education unit. A ninety-six percent of nurses deals with patents diagnosed with

pulmonary embolism were not predicated in training workshop due to poor continuous training, that is dependent on diploma graduates (Elshamy et al., 2018).

Also, our findings of demographic variables come in the similar line with findings of study carried out in public hospitals in Sana'a City-Yemen. Their results of the study showed that 51 percent are males, and 52 percent are married, have work experience of less than five years, and do not participate in training courses (Al-Gunaid, 2020).

As well as, our findings come consisting with study conducted in Baghdad City at critical care unit. The findings of this study illustrated that (64percent) of the study samples were male and (58 percent) at age groups (20-29) year old, (52 percent) were married, (46 percent) were graduate have diploma, (66 percent) had (1-5 year) skill in critical units (Hadi & Abdul-Wahhab, 2016).

5.2.Discussion Knowledge related to Pulmonary Embolism Disease

5.2.1.Knowledge related to Definition, Causes and Risk Factors of Pulmonary Embolism

Embolism is a leaded reasons of avoidable death and incapacity in the US. Acute pulmonary embolism is the third most common acute CAD, with around 600,000 case yearly and need to training the nurses staff deals with those cases (Lee et al., 2014; Carpenter, 2017). From our findings, the majority of (45.5 %) nurses work in critical care unit were moderate knowledge related to definition, causes and risk factors of pulmonary embolism (Fig. 4-2-1). Due to this part contains general information that was covered in the academic study, and it is easy to remember. This results is supported by results of Silva et al. (2020), who have tested nurses about

general information about thromboembolism, find that nurses were partially to satisfactory knowledge about this domain.

5.2.2. Knowledge related to Signs & Symptoms and Diagnostic test of Pulmonary Embolism

According to the mean analysis, the findings indicate that the majority (75.0 %) of samples were low knowledge related to signs & symptoms and diagnostic test of pulmonary embolism (Fig. 4-2-2). Because the low level of education and different education nurses attainment participated and those come with study of Najm et al. (2020), demonstrated in their findings nurses were express poor level of knowledge regarding signs and symptoms, and diagnostic test of pulmonary embolism. In view of point, the collaboration in multi disciplinary health care team member give the best outcome in those regards deals with pulmonary embolism.

5.2.3. Knowledge related to Treatment and Nurses Care Plan of Pulmonary Embolism

Detecting and treating pulmonary embolism early decreases morbidity and mortality. A pulmonary embolism can be fatal if not treated promptly. Undiagnosed or untreated pulmonary embolism kills around one-third of those who have it. The risk of death is significantly reduced when care is started early. For life-saving patients, the best-qualified nurses played a critical role (Heit, 2015). In those regards, our findings indicate that the more (88.4 %) of samples were low knowledge related to treatment and nursing care plan of pulmonary embolism (Fig. 4-2-3), due to the lower level of education and limited training. Findings come alone with findings of study conducted Aga General Hospital. Their findings showed around 50% of the studied sample (40percent) had a poor score of knowledge due to nursing care of patient with pulmonary embolism (Elshamy et al., 2018).

5.2.4.Knowledge related to Complication   of Pulmonary Embolism

According to the mean analysis, the findings indicate that the more (75.9 %) of nurses were low knowledge due to complication of pulmonary embolism (Fig. 4-2-4), due the low level of education especially the under the Bachelor's degree. This findings agree with findings of study deals with venous thromboembolism. Demonstrated findings confirmed that nurses were unsatisfactory knowledge regarding thromboembolism complication because the participants were diploma degree (Ma et al., 2018).

5.3.Overall knowledge related to Pulmonary Embolism

The overall knowledge were poor level at low level of mean+ S.d.= 1.24+0.450 as shown in figure (4-2-5). The deficit knowledge regarding pulmonary embolism =might be related to several causes; the nursing staff do not improve and update their knowledge unceasingly, most of nursing staff who work in health organizations quit book reading so they do not follow up and only indulge among nurses practice, therefore they became incapable to remembers some information mainly the knowledge that due to embolism, as well as, the highest proportion of studied sample and work in critical care unit were from institute graduated that could be lead to poor knowledge. Based on those findings nurses need to more year of experience in their workplace and participated in training workshop which indeed develop their knowledge.

Moreover, our findings originate in like line with findings of study carried out in Baghdad Hospitals. Among 60 nurses who work in critical care units were demonstrated poor knowledge towards pulmonary embolism due to those units need to be academic maturation nurses (Najm et al., 2020).

Also, study conducted at ICU at Egypt. A convenient sample of 90 samples were participate. Their findings illustrated that 71 % of studied nurses had low knowledge towards pulmonary embolism due to the low level of

education of nurses work in those units. It is needed for conducted an in services educational and training program to improve nursing performance regarding prevention measure of pulmonary embolism (Khedr et al., 2019).

As well as, our findings is same line with Khedr et al. (2019), who described that majority of researches nursing had poor level in knowledge due to pulmonary embolism. Findings of Oh et al. (2017) who indicated that most of nurses related to their pulmonary embolism knowledge were fair or low. This may be due to the lack level of in- services continuous educating regarding venous thromboembolism risk assessment and preventive. The lack of nurses knowledge regarding patients with thromboembolism due to lack of health resources and shortage of staff (Lee et al., 2014).

The present study displayed that the more of the samples had low satisfactory knowledge regarding the pulmonary embolism-related content in their nursing curricula. This is clearly detected as the majority of them had improper knowledge regarding signs & symptoms and diagnostic test of pulmonary embolism, treatment and nurses care plan of pulmonary embolism.

The causes for low of nurses' knowledge regarding from the studies' point of view might be due to poor of continuing educational program or session about pulmonary embolism, supervision, continuous evaluation of nurses' practice, and collaboration between multi disciplinary health care team member . The researcher point of view is supported by Taha and Ali (2013), who stated that nurses need to develop their knowledge especially nursing knowledge before, through and health educating as accountability for care of clients lies in the hands of nurses. Therefore, for participates to deliver high quality care and function efficiently, they must have an sufficient knowledge that they have really used in practices (Khedr, 2019).

5.4. Relationships between Nurses Knowledge towards Pulmonary Embolism and Socio-demographic Characteristics

Chi-square analysis depicted not significant relationship between nurses demographic characteristics and their knowledge towards pulmonary embolism at *p-value >0.05*. (Tables 4-4-1, 2, 4 and 5) as well as, educational attainment, years of employment in critical care unit and training sessions were significant with knowledge towards pulmonary embolism (tables 4-4-4,7 and 8).

This findings is supported by studies revealed that there is a significance association between levels of education and studied sample knowledge at p value 0.05 (Najm et al., 2020).

There were nurses knowledge significantly associated with their education and experiences, it demonstrated that the nurses with a bachelor's degree had more correct knowledge than the ones graduated from the health-care vocational high school; the nurses with 6-10 years of experience had, on the other hand, higher correct knowledge rates than other groups, in terms of some items (Al-Mugheed & Bayraktar, 2018).

Korean nursing staff demonstrated a low of knowledge about venous thromboembolism, particularly the experience in workplace were significantly associated with nurses knowledge (Oh et al., 2017). As well as, Dar es Salaam, Tanzania; confirmed that nurses who work in critical care units knowledge were statistically associated with training course (p value 0.0 5) (Said, 2012). Moreover, there were significant association between nurses knowledge regarding thromboembolism and their experience in critical care unit (Sahu et al., 2017).

Furthermore, findings of Hamel and Ahmed (2020), who depicted there were non-significant relationship between nurses knowledge in intensive care

unit and their demographic characteristics. In addition, Arrar and Mohammed (2020), confirmed in their findings exemplified that not all ICU nursing staff were trained sufficiently on the nursing care director in the ICU, improve by Iraqi Ministry of Health. That there are non-significance difference between age, gender, marital status with their knowledge.

Chapter Six

CONCLUSION AND RECOMMENDATIONS

Chapter Six

CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion:

In study findings and their discussion, this quantitative review used an assessment approach to pulmonary embolism nurses knowledge with questionnaire objects, and concludes that:

6.1.1. Young Adult male nurses aged 20-29 with a diploma who have been employed ICU for less than 5 years without training.

6.1.2. Knowledge in terms of definition, causes, risk factors of pulmonary embolism, nurses were moderate knowledge.

6.1.3. Knowledge domain in terms of signs & symptoms and diagnostic test, treatment and nurses care plan, and complication of pulmonary embolism, nurses were poor knowledge.

6.1.4. Overall Knowledge in terms of pulmonary embolism, nurses were unsatisfactory knowledge.

6.1.5. Nurses education, years of experience in CCU and training have been influenced their knowledge.

6.1.6. More years of experience in critical care unit and training the staff on pulmonary embolism by local officials help raising professionals' nurses. Provide the health resources and exploiting young energies of nurses, which indeed helps to develop their knowledge.

6.2. Recommendations:

The present study could recommended, based on the above stated conclusion, that:

6.2.1. Involves nursing staff with continuous educational program due to prevention measures of pulmonary embolism with evidence -based strategies to enhance their knowledge and practices.

6.2.2. Reassessment and follow-up for nurses need to be applied after education session to monitor, evaluate and to promote their knowledge and practice to ensure their application in job.

6.2.3. In the critical care units, it is necessary to rely on the young energies of nurses who are bachelor's degree graduated and distributed it in appropriate numbers in the critical care unit with expertise away from new appointments.

6.2.4. Babylon Health directorate need to be providing equipment and facilities in critical care unit to implementation of professional nursing practices, and should support the strength point in nurses knowledge to meet the patient's needs.

6.2.5. Further research must be carried out to include the national level and evaluate nurse's practice concerning pulmonary embolism.

References

REFERENCES

Aggarwal, K. K. (2012). American College of Radiology Five Things Physicians and Patients should Question. *Indian Journal of Multidisciplinary Dentistry*, *2*(3).

Aidas, K., Angeli, C., Bak, K. L., Bakken, V., Bast, R., Boman, L., Christiansen, O., Cimiraglia, R., Coriani, S., & Dahle, P. (2014). The D alton quantum chemistry program system. *Wiley Interdisciplinary Reviews: Computational Molecular Science*, *4*(3), 269–284.

Aiken, L. H., Cimiotti, J. P., Sloane, D. M., Smith, H. L., Flynn, L., & Neff, D. F. (2012). Effects of nurse staffing and nurse education on patient deaths in hospitals with different nurse work environments. *The Journal of Nursing Administration*, *42*(10 Suppl), S10.

Al-Janabi, H. A., Raffas, H. A., & Jassim, S. A. (2019). Incidence Rate of Mortality form Massive Pulmonary Embolism in Al-Diwaniyah Province, Iraq, During the Period from January 2011 Through December 2018. *Prof. RK Sharma*, *13*(3), 335.

Alonso-Martínez, J. L., Urbieta-Echezarreta, M., Anniccherico-Sánchez, F. J., Abínzano-Guillén, M. L., & Garcia-Sanchotena, J. L. (2009). N-terminal pro-B-type natriuretic peptide predicts the burden of pulmonary embolism. *The American Journal of the Medical Sciences*, *337*(2), 88–92.

Amiri, A., Solankallio-Vahteri, T., & Tuomi, S. (2019). Role of nurses in improving patient safety: evidence from surgical complications in 21 countries. *International Journal of Nursing Sciences*, *6*(3), 239–246.

Agency of Healthcare Research and Quality , (2015): Preoperative pulmonary embolism or deep vein thrombosis (DVT).retrived from http/www.cms.gov/outresearch-and-Education /medi care learningNetwork/MLNP/ MLNP products downloads lwpoa -fact sheet – pdf

Al-Gunaid, A. A. M. F. (2020). *Knowledge and Practice of Intensive Care Nurses Towards Weaning Criteria From Mechanical Ventilation at Public Hospitals in Sana'a City-Yemen* (Doctoral dissertation, Al-Razi University).

Ali, N. S. (2013). Critical Care Nurses' knowledge and compliance with ventilator associated pneumonia bundle at Cairo university hospitals. *Crit Care*, *4*(15), 66-78.

Al-Mugheed, K. A., & Bayraktar, N. (2018). Knowledge and practices of nurses on deep vein thrombosis risks and prophylaxis: A descriptive cross sectional study. *Journal of Vascular Nursing*, *36*(2), 71-80.

Arrar, A. A., & Mohammed, S. J. (2020). Evaluation of Nurses' Knowledge and Practices Concerning Nursing Care Guide in the Intensive Care Unit in Misan Governorate Hospitals. *kufa Journal for Nursing sciences*, *10*(1).

Aymard, T., Kadner, A., Widmer, A., Basciani, R., Tevaearai, H., Weber, A., Schmidli, J., & Carrel, T. (2013). Massive pulmonary embolism: surgical embolectomy versus thrombolytic therapy—should surgical indications be revisited? *European Journal of Cardio-Thoracic Surgery*, *43*(1), 90–94.

Azoulay, E., Pochard, F., Kentish-Barnes, N., Chevret, S., Aboab, J., Adrie, C., Annane, D., Bleichner, G., Bollaert, P. E., & Darmon, M. (2005). Risk of

post-traumatic stress symptoms in family members of intensive care unit patients. *American Journal of Respiratory and Critical Care Medicine*, *171*(9), 987–994.

Barco, S., Mahmoudpour, S. H., Planquette, B., Sanchez, O., Konstantinides, S. V, & Meyer, G. (2019). Prognostic value of right ventricular dysfunction or elevated cardiac biomarkers in patients with low-risk pulmonary embolism: a systematic review and meta-analysis. *European Heart Journal*, *40*(11), 902–910.

Bayiz, H., Dumantepe, M., Teymen, B., & Uyar, I. (2015). Percutaneous aspiration thrombectomy in treatment of massive pulmonary embolism. *Heart, Lung and Circulation*, *24*(1), 46–54.

Becattini, C., Agnelli, G., Lankeit, M., Masotti, L., Pruszczyk, P., Casazza, F., Vanni, S., Nitti, C., Kamphuisen, P., & Vedovati, M. C. (2016). Acute pulmonary embolism: mortality prediction by the 2014 European Society of Cardiology risk stratification model. *European Respiratory Journal*, *48*(3), 780–786.

Beckman, M. G., Hooper, W. C., Critchley, S. E., & Ortel, T. L. (2010). Venous thromboembolism: a public health concern. *American Journal of Preventive Medicine*, *38*(4), S495–S501.

Bělohlávek, J., Dytrych, V., & Linhart, A. (2013). Pulmonary embolism, part I: Epidemiology, risk factors and risk stratification, pathophysiology, clinical presentation, diagnosis and nonthrombotic pulmonary embolism. *Experimental & Clinical Cardiology*, *18*(2), 129.

Bodenheimer, T., & Bauer, L. (2016). Rethinking the primary care workforce—

an expanded role for nurses. *N Engl J Med*, *375*(11), 1015–1017.

Boutitie, F., Pinede, L., Schulman, S., Agnelli, G., Raskob, G., Julian, J., Hirsh, J., & Kearon, C. (2011). Influence of preceding length of anticoagulant treatment and initial presentation of venous thromboembolism on risk of recurrence after stopping treatment: analysis of individual participants' data from seven trials. *Bmj*, *342*.

Bova, C., Sanchez, O., Prandoni, P., Lankeit, M., Konstantinides, S., Vanni, S., & Jiménez, D. (2014). Identification of intermediate-risk patients with acute symptomatic pulmonary embolism. *European Respiratory Journal*, *44*(3), 694–703.

Boulton, A., Fenton, M., Loka, T., Sharif, Z., & Greenfield, S. (2015). Public Knowledge of Deep Vein Thrombosis (DVT): A Street Survey in the Suburbs of Birmingham, UK. *Quality in Primary Care*, *23*(1).

Carpenter, N. (2017). Massive Pulmonary Embolism and Thrombolytic Therapy: Case Study. *Journal of Diagnostic Medical Sonography*, *33*(3), 232-238.

Chatterjee, S., Chakraborty, A., Weinberg, I., Kadakia, M., Wilensky, R. L., Sardar, P., ... & Giri, J. (2014). Thrombolysis for pulmonary embolism and risk of all-cause mortality, major bleeding, and intracranial hemorrhage: a meta-analysis. *Jama*, *311*(23), 2414-2421.

Ceauşu, M., Luca, L., Hostiuc, S., Sîrbu, D., Sîrbu, A., & Negoi, R. (2013). Intraoperative death due to nodular amyloidosis cardiomyopathy associated with fat pulmonary embolism. *Rom J Leg Med*, *21*, 15–18.

Chatterjee, S., Chakraborty, A., Weinberg, I., Kadakia, M., Wilensky, R. L., Sardar, P., Kumbhani, D. J., Mukherjee, D., Jaff, M. R., & Giri, J. (2014). Thrombolysis for pulmonary embolism and risk of all-cause mortality, major bleeding, and intracranial hemorrhage: a meta-analysis. *Jama*, *311*(23), 2414–2421.

Chaudhry, R., & Bordoni, B. (2017). *Anatomy, thorax, lungs*.

Cole, C., Wellard, S., & Mummery, J. (2014). Problematising autonomy and advocacy in nursing. *Nursing Ethics*, *21*(5), 576–582.

Condliffe, R., Elliot, C. A., Hughes, R. J., Hurdman, J., Maclean, R. M., Sabroe, I., van Veen, J. J., & Kiely, D. G. (2014). Management dilemmas in acute pulmonary embolism. *Thorax*, *69*(2), 174–180.

Coutance, G., Cauderlier, E., Ehtisham, J., Hamon, M., & Hamon, M. (2011). The prognostic value of markers of right ventricular dysfunction in pulmonary embolism: a meta-analysis. *Critical Care*, *15*(2), R103.

Dalen, J. E. (2002). Pulmonary embolism: what have we learned since virchow?: natural history, pathophysiology, and diagnosis. *Chest*, *122*(4), 1440–1456.

Danzi, G. B., Loffi, M., Galeazzi, G., & Gherbesi, E. (2020). Acute pulmonary embolism and COVID-19 pneumonia: a random association? *European Heart Journal*, *41*(19), 1858.

Dempsey, C., Reilly, B., & Buhlman, N. (2014). Improving the patient experience: real-world strategies for engaging nurses. *JONA: The Journal of Nursing Administration*, *44*(3), 142–151.

den Exter, P. L., van Es, J., Klok, F. A., Kroft, L. J., Kruip, M. J. H. A., Kamphuisen, P. W., Büller, H. R., & Huisman, M. V. (2013). Risk profile and clinical outcome of symptomatic subsegmental acute pulmonary embolism. *Blood*, *122*(7), 1144–1149.

Dentali, F., Riva, N., Turato, S., Grazioli, S., Squizzato, A., Steidl, L., Guasti, L., Grandi, A. M., & Ageno, W. (2013). Pulmonary embolism severity index accurately predicts long-term mortality rate in patients hospitalized for acute pulmonary embolism. *Journal of Thrombosis and Haemostasis*, *11*(12), 2103–2110.

Di Nisio, M., van Es, N., & Büller, H. R. (2016). Deep vein thrombosis and pulmonary embolism. *The Lancet*, *388*(10063), 3060–3073.

Dictionary, C. (2017). Sustainability. In *2008-01-26]. http://dictionary. oed. com/cgi*.

Drake, R., Vogl, A. W., & Mitchell, A. W. M. (2009). *Gray's anatomy for students E-book*. Elsevier Health Sciences.

Duncker, H.-R. (2013). *The lung air sac system of birds: A contribution to the functional anatomy of the respiratory apparatus* (Vol. 45). Springer Science & Business Media.

Eichinger, S., Heinze, G., & Kyrle, P. A. (2014). d-Dimer Levels Over Time and the Risk of Recurrent Venous Thromboembolism: An Update of the V ienna Prediction Model. *Journal of the American Heart Association*, *3*(1), e000467.

Eikelboom, J. W., Connolly, S. J., Bosch, J., Dagenais, G. R., Hart, R. G.,

Shestakovska, O., Diaz, R., Alings, M., Lonn, E. M., & Anand, S. S. (2017). Rivaroxaban with or without aspirin in stable cardiovascular disease. *New England Journal of Medicine*, *377*(14), 1319–1330.

Elias, A., Mallett, S., Daoud-Elias, M., Poggi, J.-N., & Clarke, M. (2016). Prognostic models in acute pulmonary embolism: a systematic review and meta-analysis. *BMJ Open*, *6*(4).

Ende-Verhaar, Y. M., Cannegieter, S. C., Noordegraaf, A. V., Delcroix, M., Pruszczyk, P., Mairuhu, A. T. A., Huisman, M. V, & Klok, F. A. (2017). Incidence of chronic thromboembolic pulmonary hypertension after acute pulmonary embolism: a contemporary view of the published literature. *European Respiratory Journal*, *49*(2).

Elshamy, K.; Amal K.; & Yassmin, A. (2018). Nurses' Knowledge and Practice about Measures to Prevent Pulmonary Embolism among Patients in Aga General Hospital. *Jama*, 321(13), 1275-1285.

Francis, C. W. (2007). Prophylaxis for thromboembolism in hospitalized medical patients. *New England Journal of Medicine*, *356*(14), 1438–1444.

Friberg, F., Granum, V., & BERGH, A. (2012). Nurses' patient-education work: conditional factors–an integrative review. *Journal of Nursing Management*, *20*(2), 170–186.

Gates, M. G., Parr, M. B., & Hughen, J. E. (2012). Enhancing nursing knowledge using high-fidelity simulation. *Journal of Nursing Education*, *51*(1), 9–15.

Goldhaber, S. Z., & Bounameaux, H. (2012). Pulmonary embolism and deep vein thrombosis. *The Lancet*, *379*(9828), 1835–1846.

Grifoni, S., Vanni, S., Magazzini, S., Olivotto, I., Conti, A., Zanobetti, M., Polidori, G., Pieralli, F., Peiman, N., & Becattini, C. (2006). Association of persistent right ventricular dysfunction at hospital discharge after acute pulmonary embolism with recurrent thromboembolic events. *Archives of Internal Medicine*, *166*(19), 2151–2156.

Hanna, E. B. (2017). *Part 9 Other Cardiovascular Disease States 21 Pulmonary Embolism and Deep Vein Thrombosis*. 439–448.

Hayıroğlu, M. İ., Keskin, M., Keskin, T., Uzun, A. O., Altay, S., Kaya, A., Öz, A., Çinier, G., Güvenç, T. S., & Kozan, Ö. (2018). A novel independent survival predictor in pulmonary embolism: prognostic nutritional index. *Clinical and Applied Thrombosis/Hemostasis*, *24*(4), 633–639.

Haza'a, A. A., Al-Qubati, F. A., Mohammed, M. A., AbdEL-Aziz, M. A., & Mehany, M. M. (n.d.). *Effect of an educational program on nurses' knowledge and practice regarding complications of pulmonary embolism.*

Haza'a, A., Al-Qubati, F. A., Mohammed, M. A., Abdel-Aziz, M. A., & Mehany, M. M. (2020). Effect of An Educational Program on Critical Care Nurses Performance regarding Emergency Care for Patients with Pulmonary Embolism. *Assiut Scientific Nursing Journal*, *8*(20), 31–44.

Heit, J. A. (2008). The epidemiology of venous thromboembolism in the community. *Arteriosclerosis, Thrombosis, and Vascular Biology*, *28*(3), 370–372.

Huisman, M V, & Klok, F. A. (2013). Diagnostic management of acute deep vein thrombosis and pulmonary embolism. *Journal of Thrombosis and Haemostasis*, *11*(3), 412–422.

Huisman, Menno V, & Klok, F. A. (2013). How I diagnose acute pulmonary embolism. *Blood, The Journal of the American Society of Hematology*, *121*(22), 4443–4448.

Hutchinson, B. D., Navin, P., Marom, E. M., Truong, M. T., & Bruzzi, J. F. (2015). Overdiagnosis of pulmonary embolism by pulmonary CT angiography. *American Journal of Roentgenology*, *205*(2), 271–277.

HadiAtiyah, H., & Abdul-Wahhab, M. M. (2016). Nurses Knowledge toward Essential Care for Adult Patients Undergoing Mechanical Ventilation at Critical Care Unit in Baghdad City. *Higher education*, *4*(8.0), 100-0.

Hamel, O. L., & Ahmed, S. A. (2020). Effectiveness of an Educational Program on Nurses' Knowledge and Practices Regarding Nursing Interventions of Chest Tube Drainage System in Ibn Alnafees Teaching Hospital. *Indian Journal of Public Health Research & Development*, *11*(4).

Heit, J. A. (2015). Epidemiology of venous thromboembolism. *Nature Reviews Cardiology*, *12*(8), 464-474.

Judge, E. P., Hughes, J. M. L., Egan, J. J., Maguire, M., Molloy, E. L., & O'Dea, S. (2014). Anatomy and bronchoscopy of the porcine lung. A model for translational respiratory medicine. *American Journal of Respiratory Cell and Molecular Biology*, *51*(3), 334–343.

Kabrhel, C., Okechukwu, I., Hariharan, P., Takayesu, J. K., MacMahon, P., Haddad, F., & Chang, Y. (2014). Factors associated with clinical deterioration shortly after PE. *Thorax*, *69*(9), 835–842.

Kalb, B., Sharma, P., Tigges, S., Ray, G. L., Kitajima, H. D., Costello, J. R.,

Chen, Z., & Martin, D. R. (2012). MR imaging of pulmonary embolism: diagnostic accuracy of contrast-enhanced 3D MR pulmonary angiography, contrast-enhanced low–flip angle 3D GRE, and nonenhanced free-induction FISP sequences. *Radiology*, *263*(1), 271–278.

Kearon, C. (2003). Natural history of venous thromboembolism. *Circulation*, *107*(23_suppl_1), I–22.

Kline, J. A., & Kabrhel, C. (2015). Emergency evaluation for pulmonary embolism, part 1: clinical factors that increase risk. *The Journal of Emergency Medicine*, *48*(6), 771–780.

Klok, F A, Van der Hulle, T., Den Exter, P. L., Lankeit, M., Huisman, M. V, & Konstantinides, S. (2014). The post-PE syndrome: a new concept for chronic complications of pulmonary embolism. *Blood Reviews*, *28*(6), 221–226.

Klok, Frederikus A, Zondag, W., van Kralingen, K. W., van Dijk, A. P. J., Tamsma, J. T., Heyning, F. H., Vliegen, H. W., & Huisman, M. V. (2010). Patient outcomes after acute pulmonary embolism: a pooled survival analysis of different adverse events. *American Journal of Respiratory and Critical Care Medicine*, *181*(5), 501–506.

Konstantinides, S. V, Barco, S., Lankeit, M., & Meyer, G. (2016). Management of pulmonary embolism: an update. *Journal of the American College of Cardiology*, *67*(8), 976–990.

Konstantinides, S. V, Vicaut, E., Danays, T., Becattini, C., Bertoletti, L., Beyer-Westendorf, J., Bouvaist, H., Couturaud, F., Dellas, C., & Duerschmied, D. (2017). Impact of thrombolytic therapy on the long-term outcome of

intermediate-risk pulmonary embolism. *Journal of the American College of Cardiology*, *69*(12), 1536–1544.

Kucher, N., Rossi, E., & DeRosa, M. (2006). Massive pulmonary embolism. *Journal of Vascular Surgery*, *44*(3), 684–685.

Kukla, P., McIntyre, W. F., Fijorek, K., Mirek-Bryniarska, E., Bryniarski, L., Krupa, E., Jastrzębski, M., Bryniarski, K. L., Zhong-qun, Z., & Baranchuk, A. (2014). Electrocardiographic abnormalities in patients with acute pulmonary embolism complicated by cardiogenic shock. *The American Journal of Emergency Medicine*, *32*(6), 507–510.

Kuo, W. T. (2012). Endovascular therapy for acute pulmonary embolism. *Journal of Vascular and Interventional Radiology*, *23*(2), 167–179.

Lambrini, K., Konstantinos, K., Christos, I., Petros, O., & Areti, T. (2018). Pulmonary Embolism: A Literature Review. *American Journal of Nursing Science*, *7*(3–1), 57–61.

Lankeit, M., Jiménez, D., Kostrubiec, M., Dellas, C., Kuhnert, K., Hasenfuß, G., Pruszczyk, P., & Konstantinides, S. (2014). Validation of N-terminal pro-brain natriuretic peptide cut-off values for risk stratification of pulmonary embolism. *European Respiratory Journal*, *43*(6), 1669–1677.

Lee, A., deSancho, M., & Pai, M. (2020). COVID-19 and pulmonary embolism: frequently asked questions. *Americam Society of Haematology, COVID-Resources. Update*, *10*.

Lewis, S. M., McLean, M., & Dirksen, S. R. (2000). *MEDICAL-SURGICAL NURSING: Assessment and Management of Clinical Problems. Vol. 1*.

Li, H., Zhang, X., Park, P., Liu, W., Chang, J., Liao, Z., Frank, S., Li, Y., Poenisch, F., & Mohan, R. (2015). Robust optimization in intensity-modulated proton therapy to account for anatomy changes in lung cancer patients. *Radiotherapy and Oncology*, *114*(3), 367–372.

Lodigiani, C., Iapichino, G., Carenzo, L., Cecconi, M., Ferrazzi, P., Sebastian, T., Kucher, N., Studt, J.-D., Sacco, C., & Alexia, B. (2020). Venous and arterial thromboembolic complications in COVID-19 patients admitted to an academic hospital in Milan, Italy. *Thrombosis Research*, *191*, 9–14.

Mahdi, N. S., & Mansour, K. A. (2021). Nurses' Knowledge toward Preventive Measure of Pulmonary Embolism in AL Nasiriyah City. *Annals of the Romanian Society for Cell Biology*, *25*(7), 497–506.

Meinel, F. G., Nance Jr, J. W., Schoepf, U. J., Hoffmann, V. S., Thierfelder, K. M., Costello, P., Goldhaber, S. Z., & Bamberg, F. (2015). Predictive value of computed tomography in acute pulmonary embolism: systematic review and meta-analysis. *The American Journal of Medicine*, *128*(7), 747–759.

Members, A. F., Konstantinides, S. V, Torbicki, A., Agnelli, G., Danchin, N., Fitzmaurice, D., Galiè, N., Gibbs, J. S. R., Huisman, M. V, & Humbert, M. (2014). 2014 ESC Guidelines on the diagnosis and management of acute pulmonary embolism: The Task Force for the Diagnosis and Management of Acute Pulmonary Embolism of the European Society of Cardiology (ESC) Endorsed by the European Respiratory Society (ERS). *European Heart Journal*, *35*(43), 3033–3080.

Meissner, H. I., Breen, N., Klabunde, C. N., & Vernon, S. W. (2006). Patterns of colorectal cancer screening uptake among men and women in the United

States. Cancer Epidemiology and Prevention Biomarkers, 15(2), 389-394.

Members, A. F., Torbicki, A., Perrier, A., Konstantinides, S., Agnelli, G., Galiè, N., Pruszczyk, P., Bengel, F., Brady, A. J. B., & Ferreira, D. (2008). Guidelines on the diagnosis and management of acute pulmonary embolism: the Task Force for the Diagnosis and Management of Acute Pulmonary Embolism of the European Society of Cardiology (ESC). *European Heart Journal*, *29*(18), 2276–2315.

Mestre-Gómez, B., Lorente-Ramos, R. M., Rogado, J., Franco-Moreno, A., Obispo, B., Salazar-Chiriboga, D., Saez-Vaquero, T., Torres-Macho, J., Abad-Motos, A., & Cortina-Camarero, C. (2021). Incidence of pulmonary embolism in non-critically ill COVID-19 patients. Predicting factors for a challenging diagnosis. *Journal of Thrombosis and Thrombolysis*, *51*(1), 40–46.

Meyer, G., Vieillard-Baron, A., & Planquette, B. (2016). Recent advances in the management of pulmonary embolism: focus on the critically ill patients. *Annals of Intensive Care*, *6*(1), 1–8.

Mismetti, P., Laporte, S., Pellerin, O., Ennezat, P.-V., Couturaud, F., Elias, A., Falvo, N., Meneveau, N., Quere, I., & Roy, P.-M. (2015). Effect of a retrievable inferior vena cava filter plus anticoagulation vs anticoagulation alone on risk of recurrent pulmonary embolism: a randomized clinical trial. *Jama*, *313*(16), 1627–1635.

Moore, A. J. E., Wachsmann, J., Chamarthy, M. R., Panjikaran, L., Tanabe, Y., & Rajiah, P. (2018). Imaging of acute pulmonary embolism: an update. *Cardiovascular Diagnosis and Therapy*, *8*(3), 225.

Moore, K. L., & Dalley, A. F. (2018). *Clinically oriented anatomy*. Wolters kluwer india Pvt Ltd.

Ma, Y. F., Xu, Y., Chen, Y. P., Wang, X. J., Deng, H. B., He, Y., & Wu, X. J. (2018). Nurses' objective knowledge regarding venous thromboembolism prophylaxis. *Medicine*, *97*(14), e0338-e0338.

Mohammed, S. J., Hamdan, A. S., Ali, A. M., Aaly, A. A., & Hadi, W. H. Assessment Nurses Knowledge toward Anticoagulation Therapy for Patients at Blood Disease Ward in Teaching Hospital in Baghdad city.

Najm, M. A., Jassim, A. H., & Mohammed, T. R. (2020). Critical care nurses' knowledge about pulmonary embolism in respiratory care unit in Baghdad teaching hospitals. *Indian Journal of Forensic Medicine and Toxicology*, *14*(3), 859–865. https://doi.org/10.37506/ijfmt.v14i3.10484

Ng, Y. L., Mann, V., & Gulabivala, K. (2011). A prospective study of the factors affecting outcomes of nonsurgical root canal treatment: part 1: periapical health. International endodontic journal, 44(7), 583-609.

Oqab, Z., Ganshorn, H., & Sheldon, R. (2018). Prevalence of pulmonary embolism in patients presenting with syncope. A systematic review and meta-analysis. *The American Journal of Emergency Medicine*, *36*(4), 551–555.

Oh, H., Boo, S., & Lee, J. A. (2017). Clinical nurses' knowledge and practice of venous thromboembolism risk assessment and prevention in South Korea: a cross-sectional survey. *Journal of clinical nursing*, *26*(3-4), 427-435.

Perkins, D. N. (2013). *Knowledge as design*. Routledge.

Poissy, J., Goutay, J., Caplan, M., Parmentier, E., Duburcq, T., Lassalle, F., Jeanpierre, E., Rauch, A., Labreuche, J., & Susen, S. (2020). Pulmonary embolism in patients with COVID-19: awareness of an increased prevalence. *Circulation*, *142*(2), 184–186.

Pollack, C. V, Schreiber, D., Goldhaber, S. Z., Slattery, D., Fanikos, J., O'Neil, B. J., Thompson, J. R., Hiestand, B., Briese, B. A., & Pendleton, R. C. (2011). Clinical characteristics, management, and outcomes of patients diagnosed with acute pulmonary embolism in the emergency department: initial report of EMPEROR (Multicenter Emergency Medicine Pulmonary Embolism in the Real World Registry). *Journal of the American College of Cardiology*, *57*(6), 700–706.

Poyiadji, N., Cormier, P., Patel, P. Y., Hadied, M. O., Bhargava, P., Khanna, K., Nadig, J., Keimig, T., Spizarny, D., & Reeser, N. (2020). Acute pulmonary embolism and COVID-19. *Radiology*, *297*(3), E335–E338.

Prandoni, P., Lensing, A. W. A., Prins, M. H., Ciammaichella, M., Perlati, M., Mumoli, N., Bucherini, E., Visonà, A., Bova, C., & Imberti, D. (2016). Prevalence of pulmonary embolism among patients hospitalized for syncope. *N Engl J Med*, *375*, 1524–1531.

Pruszczyk, P., Goliszek, S., Lichodziejewska, B., Kostrubiec, M., Ciurzyński, M., Kurnicka, K., Dzikowska-Diduch, O., Palczewski, P., & Wyzgal, A. (2014). Prognostic value of echocardiography in normotensive patients with acute pulmonary embolism. *JACC: Cardiovascular Imaging*, *7*(6), 553–560.

Rahman, A., & Broadley, S. A. (2014). Elevated troponin: Diagnostic gold or fool's gold? *Emergency Medicine Australasia*, *26*(2), 125–130.

Raja, A. S., Greenberg, J. O., Qaseem, A., Denberg, T. D., Fitterman, N., & Schuur, J. D. (2015). Evaluation of patients with suspected acute pulmonary embolism: best practice advice from the Clinical Guidelines Committee of the American College of Physicians. *Annals of Internal Medicine*, *163*(9), 701–711.

Revel, M. P., Sanchez, O., Couchon, S., Planquette, B., Hernigou, A., Niarra, R., Meyer, G., & Chatellier, G. (2012). Diagnostic accuracy of magnetic resonance imaging for an acute pulmonary embolism: results of the 'IRM-EP'study. *Journal of Thrombosis and Haemostasis*, *10*(5), 743–750.

Sanchez, O., Trinquart, L., Caille, V., Couturaud, F., Pacouret, G., Meneveau, N., Verschuren, F., Roy, P.-M., Parent, F., & Righini, M. (2010). Prognostic factors for pulmonary embolism: the prep study, a prospective multicenter cohort study. *American Journal of Respiratory and Critical Care Medicine*, *181*(2), 168–173.

Scherz, N., Labarère, J., Méan, M., Ibrahim, S. A., Fine, M. J., & Aujesky, D. (2010). Prognostic importance of hyponatremia in patients with acute pulmonary embolism. *American Journal of Respiratory and Critical Care Medicine*, *182*(9), 1178–1183.

Sen, H. S., Abakay, O., Tanrikulu, A. C., Sezgi, C., Taylan, M., Abakay, A., Kaya, H., & Senyigit, A. (2014). Is a complete blood cell count useful in determining the prognosis of pulmonary embolism? *Wiener Klinische Wochenschrift*, *126*(11), 347–354.

Shiraev, T. P., Omari, A., & Rushworth, R. L. (2013). Trends in pulmonary embolism morbidity and mortality in Australia. *Thrombosis Research*, *132*(1), 19–25.

Sommer, N., Dietrich, A., Schermuly, R. T., Ghofrani, H. A., Gudermann, T., Schulz, R., Seeger, W., Grimminger, F., & Weissmann, N. (2008). Regulation of hypoxic pulmonary vasoconstriction: basic mechanisms. *European Respiratory Journal*, *32*(6), 1639–1651.

Standring, S., Ellis, H., & Healy, J. C. (2008). Gray's anatomy: the anatomical basis of clinical practice. In *:* (pp. 1455–1456).

Stein, P. D., Matta, F., Keyes, D. C., & Willyerd, G. L. (2012). Impact of vena cava filters on in-hospital case fatality rate from pulmonary embolism. *The American Journal of Medicine*, *125*(5), 478–484.

Stein, P. D., Sostman, H. D., Hull, R. D., Goodman, L. R., Leeper Jr, K. V, Gottschalk, A., Tapson, V. F., & Woodard, P. K. (2009). Diagnosis of pulmonary embolism in the coronary care unit. *The American Journal of Cardiology*, *103*(6), 881–886.

Sahu, R., Menon, S. A., Anik, S., & Rai, A. (2017). A study to assess the effectiveness of planned teaching programme on knowledge regarding Deep Vein Thrombosis among B. Sc. Nursing intern's working in Jawaharlal Nehru Hospital and Research Centre Bhilai (CG). *International Journal of Nursing Education and Research*, *5*(3), 272-278.

Said, A. T. (2012). *Knowledge and practice of intensive care nurses on prevention of ventilator associated pneumonia at Muhimbili national*

hospital, Dar es Salaam, Tanzania (Doctoral dissertation, Muhimbili University of Health and Allied Sciences).

Silva, J. S. D., Lee, J. A., Grisante, D. L., Lopes, J. D. L., & Lopes, C. T. (2020). Nurses' knowledge, risk assessment, and self-efficacy regarding venous thromboembolism. *Acta Paul Enferm*, *33*.

Takahashi, H., Okada, K., Matsumori, M., Kano, H., Kitagawa, A., & Okita, Y. (2012). Aggressive surgical treatment of acute pulmonary embolism with circulatory collapse. *The Annals of Thoracic Surgery*, *94*(3), 785–791.

Toplis, E., & Mortimore, G. (2020). The diagnosis and management of pulmonary embolism. *British Journal of Nursing*, *29*(1), 22–26.

Tortora, G. J., & Derrickson, B. H. (2018). *Principles of anatomy and physiology*. John Wiley & Sons.

Turetz, M., Sideris, A. T., Friedman, O. A., Triphathi, N., & Horowitz, J. M. (2018). Pulmonary Embolism: Epidemiology, Pathophysiology, and Natural History of Pulmonary Embolism. *Seminars in Interventional Radiology*, *35*(2), 92.

Taha, N. M., & Ali, Z. H. (2013). Physical restraints in critical care units: impact of a training program on nurses' knowledge and practice and on patients' outcomes. *J Nurs Care*, *2*(2), 1-9.

Van Der Pol, L. M., Tromeur, C., Bistervels, I. M., Ni Ainle, F., Van Bemmel, T., Bertoletti, L., Couturaud, F., van Dooren, Y. P. A., Elias, A., & Faber, L. M. (2019). Pregnancy-adapted YEARS algorithm for diagnosis of suspected pulmonary embolism. *New England Journal of Medicine*,

380(12), 1139–1149.

Vedovati, M. C., Germini, F., Agnelli, G., & Becattini, C. (2015). Direct oral anticoagulants in patients with VTE and cancer. *Chest*, *147*(2), 475–483.

Wielpütz, M. O., Puderbach, M., Kopp-Schneider, A., Stahl, M., Fritzsching, E., Sommerburg, O., Ley, S., Sumkauskaite, M., Biederer, J., & Kauczor, H.-U. (2014). Magnetic resonance imaging detects changes in structure and perfusion, and response to therapy in early cystic fibrosis lung disease. *American Journal of Respiratory and Critical Care Medicine*, *189*(8), 956–965.

Xie, Y., Wang, X., Yang, P., & Zhang, S. (2020). COVID-19 complicated by acute pulmonary embolism. *Radiology: Cardiothoracic Imaging*, *2*(2), e200067.

Xu, Y., Wang, W., Zhen, K., & Zhao, J. (2020). Healthcare professionals' knowledge, attitudes, and practices regarding graduated compression stockings: a survey of China's big-data network. *BMC Health Services Research*, *20*(1), 1–7.

Ye, R., Zhao, L., Wang, C., Wu, X., & Yan, H. (2014). Clinical characteristics of septic pulmonary embolism in adults: a systematic review. *Respiratory Medicine*, *108*(1), 1–8.

York, N. L., Kane, C. J., Smith, C., & Minton, L. A. (2015). Care of the patient with an acute pulmonary embolism. *Dimensions of Critical Care Nursing*, *34*(1), 3–9.

Zhou, X.-Y., Ben, S.-Q., Chen, H.-L., & Ni, S.-S. (2012). The prognostic value

of pulmonary embolism severity index in acute pulmonary embolism: a meta-analysis. *Respiratory Research*, *13*(1), 1–12.

Appendices

APPENDIX (A)

Administrative Arrangements

Ministry of Health
Babil Health Directorate
Imam Sadiq General Hospital

جمهورية العراق

وزارة الصحة
دائرة صحة بابل
مستشفى الإمام الصادق (ع)
العدد
التاريخ   /2021

إلى /دائرة صحة بابل /مكتب المدير العام/مركز التدريب والتنمية البشرية

م/ تسهيل مهمة

اشارة الى كتابكم المرقم (٣٦٣) بتاريخ ٢٠٢١/٣/ ١١ لامانع لدينا من تسهيل مهمة طالب الماجستير (أحمد علي عبد الهادي) التابع الى جامعة بابل/ كلية التمريض لاتمام بحث التخرج الخاص به قدر تعلق الامر بنا وحسب الضوابط على ان لاتتحمل مستشفانا أي تبعات مالية او قانونيه وحسب الضوابط

...مع الاحترام .

الطبيب الاختصاص
خالد فلاح نعمه الفتلاوي
مدير مستشفى الإمام الصادق (ع) التعليمي
الصادرة
٢٠٢١/

نسخة منه الى

- مكتب مدير المستشفى
- وحدة التدريب والبحوث
- الأرشيف/الإدارية
- المعاون العلمي

APPENDIX (A)

وزارة الصحة والبيئة
دائرة صحة محافظة بابــــل
المديـــر العـــام
مركــز التدريب والتنمية البشرية
وحدة أدارة البحوث

العدد : ٦٧٢

التاريخ: ١١/ ٢ /٢٠٢١

Ministry Of Health
Babylon Health Directorate
Email:-
Babel_Healthmoh@yahoo.com
Tel:282628 or 282621

إلى / مستشفى الأمام الصادق (ع)
مستشفى الحلة التعليمي ، مستشفى بابل التعليمي للنسائية والأطفال
مستشفى مرجان التعليمي
م/ تسهيل مهمة

السلام عليكم ...

أشارة إلى كتاب جامعة بابل / كلية التمريض/ لجنة الدراسات العليا ذي العدد ٦٧٢
في ٢٠٢١/٣/٣

نرفق لكم ربطا استمارات الموافقة المبدئية لمشروع البحث العائد للباحث طالب الدراسات
الماجستير(احمد علي عبد الهادي عمران)
للتفضل بالاطلاع وتسهيل مهمة الموما أليه من خلال توقيع وختم استمارات اجراء البحث
المرفقة في مؤسساتكم وحسب الضوابط والإمكانات لاستحصال الموافقة المبدئية ليتسنى لنا
أجراء اللازم على أن لا تتحمل مؤسساتكم أية تبعات مادية وقانونية .... مع الاحترام

المرفقات :
استمارة عدد /٢

الدكتور
محمد عبد الله عجرش
مدير مركز التدريب والتنمية البشرية
/   / ٢٠٢١

نسخة منه إلى :

• مركز التدريب والتنمية البشرية / وحدة أدارة البحوث مع الأوليات ...

جمهورية العراق

Ministry Of Health
Babylon Health Directorate
Email:-
Babel_Healthmoh@yahoo.com
Tel:282628 or 282621

وزارة الصحة والبيئة
دائرة صحة محافظة بابـــل
المديـــر العـــام
مركـز التدريب والتنمية البشرية
وحدة أدارة البحوث

العدد : ٦٧٢

التاريخ: ١١ / ٢ / ٢٠٢١

إلى / مستشفى الأمام الصادق (ع)
مستشفى الحلة التعليمي ، مستشفى بابل التعليمي للنسائية والأطفال
مستشفى مرجان التعليمي
م/ تسهيل مهمة

السلام عليكم ...
أشارة إلى كتاب جامعة بابل / كلية التمريض/ لجنة الدراسات العليا ذي العدد ٦٧٢
في ٢٠٢١/٣/٣

نرفق لكم ربطا استمارات الموافقة المبدئية لمشروع البحث العائد للباحث طالب الدراسات
الماجستير(احمد علي عبد الهادي عمران)
للتفضل بالاطلاع وتسهيل مهمة الموما أليه من خلال توقيع وختم استمارات اجراء البحث
المرفقة في مؤسساتكم وحسب الضوابط والإمكانات لاستحصال الموافقة المبدئية ليتسنى لنا
أجراء اللازم على أن لا تتحمل مؤسساتكم أية تبعات مادية وقانونية .... مع الاحترام

المرفقات :
استمارة عدد ٢/

الدكتور
محمد عبد الله عجرش
مدير مركز التدريب والتنمية البشرية
/ / ٢٠٢١

نسخة منه إلى :
• مركز التدريب والتنمية البشرية / وحدة أدارة البحوث مع الأوليات ...

APPENDIX (A)

جمهورية العراق

وزارة الصحة والبيئة
دائرة صحة محافظة بابـــل
المديـــر العـــام
مركـز التدريب والتنمية البشرية
وحدة أدارة البحوث

العدد : ٦٧٢

التاريخ: ١١ / ٢ / ٢٠٢١

وزارة الصحة
دائرة صحة بابل
مركز التدريب والتنمية البشرية

إلى / مستشفى الأمام الصادق (ع)

مستشفى الحلة التعليمي ، مستشفى بابل التعليمي للنسانية والأطفال

مستشفى مرجان التعليمي

م/ تسهيل مهمة

السلام عليكم ...

أشارة إلى كتاب جامعة بابل / كلية التمريض/ لجنة الدراسات العليا ذي العدد ٦٧٢ في ٢٠٢١/٣/٣

نرفق لكم ربطا استمارات الموافقة المبدئية لمشروع البحث العائد للباحث طالب الدراسات الماجستير(احمد علي عبد الهادي عمران)

للتفضل بالاطلاع وتسهيل مهمة المومأ أليه من خلال توقيع وختم استمارات اجراء البحث المرفقة في مؤسساتكم وحسب الضوابط والإمكانات لاستحصال الموافقة المبدئية ليتسنى لنا أجراء اللازم على أن لا تتحمل مؤسساتكم أية تبعات مادية وقانونية .... مع الاحترام

المرفقات :

استمارة عدد /٢

الدكتور
محمد عبد الله عجرش
مدير مركز التدريب والتنمية البشرية
/ / ٢٠٢١

نسخة منه إلى :

• مركز التدريب والتنمية البشرية / وحدة أدارة البحوث مع الأوليات ...

	عينات مختبرية (دم، ادرار، خروج، مسحات من موقع الاصابة)
	اجهزة / مواد
	معلومات من السجلات او ملفات المرضى
	المرضى / المراجعين للمستشفى/ المنتسبين
استبانة المرضى	اخرى تذكر

10. وقت ومكان اجراء البحث(الاماكن المقترحة لاجراء البحث فيها) :

• الوقت من ---8:30 صباحا -------- الى -10:30مساءا-----------

2

• اماكن اجراء البحث

الموافقة (الاسم الثلاثي وختم المؤسسة)	اسم الدائرة / اسم المؤسسة الصحية
الصيدلانية الاختصاص احمد جمعة زيد ... ١٠/٢/٣م م. د هيئة البحوث	دائرة صحة بابل / مستشفى الامام الصادق (ع)
لا مانع لدينا لجنة التعليم الطبي المستمر م.م ايراء صاحب	دائرة صحة بابل / مستشفى الحلة التعليمي
	دائرة صحة بابل/ مستشفى مرجان

11. الموارد المالية : مصدر تمويل البحث ان وجد / لايوجد

12. منهجية البحث Methodology:

A. تصميم الدراسة Study design

Descriptive, cross-sectional study

B. تعريف العينة البحثية،الحالات المستبعدة والية اختيار العينة

(Case definition, exclusion criteria and sampling methods)

A nurse: : is a person who has competency, works to promote and maintain health of ill or well individual and provide nursing care for patients
Knowledge; is the information, fact, and proficiency gained by nurses through their education and experiments

ملاحظة: تملئ هذه الاستمارة الكترونيا ولاتقبل الاستمارة المملوءة يدويا

English Questionnaire

Part 1 / Demographical data

---

1. Age : _____

2. Gender :   Male: ☐   Female ☐

3. Marital status :   Single   ☐

                    Married   ☐

                    Widower   ☐

                    Divorce   ☐

4. Level of education :

   Graduate of a nursing primary school   ☐

   Graduate of nursing secondary school   ☐

   Graduate of Nursing Institute   ☐

   Graduate of the College of Nursing / Bachelor   ☐

   Master's degree in nursing   ☐

   PhD in Nursing   ☐

5. Work place (department name) _____

6. The number of years of experience in the nursing field - _____

7. The number of years of experience in critical care units

APPENDIX (B)

Part 2 / Knowledge Assessment according to 4 Domain

Domain 1 Nurses knowledge concerning definition, causes and risk factors of disease

1. **Pulmonary embolism is a _____ of a central blood vessel in the arteries of the lungs?**
   a. Blockage
   b. Narrowing
   c. Damage
   d. All above

2. **What is pulmonary embolism?**
   a. A blood clot obstructing a pulmonary artery
   b. A blood clot obstructing the aorta.
   c. A blood clot in the deep veins of the extremities or pelvis
   d. Right sided heart failure

3. **What is the most frequent cause of pulmonary embolism?**
   a. Congestive heart failure
   b. Hemorrhagic fever
   c. Deep vein thrombosis
   d. Pneumonia

4. **One of the choice is not causes of pulmonary embolism ?**
   a. DVT
   b. Air bubbles
   c. Cancer tumors
   d. Not of all above

5. **Hemoptysis is _____.**

    a. Coughing up blood

    b. Bloody sinus secretions

    c. Vomiting blood

    d. All above

6. **An imbalance between the supply of blood and the supply of air to the lungs is called _____.**

    a. Serum-oxygen imbalance

    b. Hematoperfusion imbalance

    c. Ventilation-perfusion mismatch

    d. Myocardial ischemia

7. **The most common site of origination of pulmonary embolisms (PE) is/are _____.**

    a. Deep veins of lower extremities (LE).

    b. Pelvis

    c. Right atrium

    d. Both a and b

8. **There are several causes of pulmonary embolism, the most common is ?**

    a. air bubbles

    b. fat droplets

    c. Amniotic Fluid

    d. DVT

9. **There are several risk factors for pulmonary embolism, except _____?**

    a. Young age

    b. Contraceptive use

    c. Having had recent injury or trauma to a vein

    d. Traumatic hip fractures that immobilize the patient

10. One of the following is increase risk of pulmonary embolism?

  a. COVID19

  b. Heart disease

  c. Disorders affect blood clots

  d. All above

11. When working with women who are taking hormonal birth control, what health promotion measures should the nurse teach to prevent possible pulmonary embolism (PE) except ?

  a. stop smoking .

  b. Eat more omega-3 fatty acids.

  c. Exercise on a regular basis.

  d. Maintain a healthy weight.

12. Having a pulmonary embolism includes risk of possible _____.

a. Sudden death

b. Diabetes

c. High blood pressure

d. Amputation of limbs

13. Who is at greater risk for pulmonary embolism?

  a. Women

  b. Men

  c. The risk is the same for men and women

  d. All above

14. Which of the following is NOT a reason or risk factor for PE?

    a. Injury to the deep vein of the leg, such as through surgery

    b. Immobility

    c. Young age (under 25)

d. A and b only.

15. **A nurse is caring for four clients on intravenous heparin therapy. Which laboratory value possibly indicates that a serious side effect has occurred?**

a. Hemoglobin: 14.2 g/dL

b. Platelet count: 82,000/L

c. Red blood cell count: 4.8/mm3

d. White blood cell count: 8.7/mm3

16. **What is a NORMAL platelet count value?**

   a. 75000- 150000

   b. 150000- 450000

   c. 450000-500000

   d. 80000-180000

Domain 2: Nurses knowledge concerning signs and symptoms and diagnostic test of pulmonary embolism

1. **When a pulmonary embolism occurs, which of the following are appear?**

   a. The patient will become bradycardia

   b. The patient will have an increase of PO2 noted on their arterial blood gas

   c. Ventilation-perfusion mismatch and decrease in surfactant production by the alveoli

   d. Nothing, patients usually show no clinical signs/symptoms.

2. **Which of the following symptoms are <u>not characteristic</u> for pulmonary embolism ?**

   a. Sudden shortness of breath .

   b. Chest pain (usually worse with breathing).

c. Coughing or coughing up blood

d. Sudden Chest Pain extended to arm. ...

3. A client has experienced pulmonary embolism. The nurse should assess for which symptom, which is most commonly reported?

  e. Hot, flushed feeling

  f.Sudden chills and fever

  g. Chest pain that occurs suddenly

  h. Dyspnea when deep breaths are taken

4. A 67-year-old patient with dyspnea comes in to the ED. The patient has a former history of bladder cancer, he has swollen left leg, which is very painful, and he has a heart rate of 110 bpm.

  What is the patient's risk of having a pulmonary embolism?

a. Low

b. Moderate (the patient gets a score of 5,5 points on the Well's Score)

c. High

d. There is no risk factor

5. All the following symptoms of PE , except?

a. Rapid and ragular heart bet

b. Dizziness

c. Clamy or discolord skin

d. Pulmenary hypertention

6. **Signs and symptoms of a pulmonary embolism depend on _____.**

a. Size and location of clot.

b. Size of clot only

c. Amount of blood that can flow around clot.

d. Patient's pulmonary health prior to the pulmonary embolism

7. **Signs and symptoms of pulmonary embolism (PE) can include:**

   a. Redness, warmth, tenderness and swelling

   b. Shortness of breath, chest pain, coughing blood

   c. Muscle spasms, vertigo, ringing ears

   d. All of the above

8. **In diagnosing pulmonary embolism which of the following signs is most reliable:**

   a. Pulse rate

   b. Respiratory rate

   c. Blood pressure

   d. None of the above

9. **A client is admitted with a pulmonary embolism (PE). The client is young, healthy, and active and has no known risk factors for PE. What action by the nurse is most appropriate?**

   a. Encourage the client to walk 5 minutes each hour.

   b. Refer the client to smoking cessation classes.

   c. Teach the client about factor V Leiden testing.

   d. Tell the client that sometimes no cause for disease is found.

10. **There are several signs and symptoms that are expected to be found in a patient suffering from embolism, except for _____?**

A. Bradypnea (slow breathing)

B. Pleural friction rub (raspy sound on exhale)

D. Petechiae (red/purple spots on chest area)

E. Tachycardia (rapid HR)

11. **A client has a pulmonary embolism and is started on oxygen. The student nurse asks why the clients oxygen saturation has not significantly improved. What response by the nurse is best?**

    a. Breathing so rapidly interferes with oxygenation.

    b. Maybe the client has respiratory distress syndrome.

    c. The blood clot interferes with perfusion in the lungs.

    d. The client needs immediate intubation and mechanical ventilation.

12. **A nurse is assisting the health care provider who is intubating a client. The provider has been attempting to intubate for 40 seconds. What action by the nurse takes priority?**

    a. Ensure the client has adequate sedation.

    b. Find another provider to intubate.

    c. Interrupt the procedure to give oxygen.

    d. Monitor the clients oxygen saturation.

13. **An intubated clients oxygen saturation has dropped to 88%. What action by the nurse takes priority?**

    a. Determine if the tube is kinked.

    b. Ensure all connections are patent.

    c. Listen to the clients lung sounds.

    d. Suction the endotracheal tube.

APPENDIX (B)

Domain 3: Nurses knowledge concerning treatment and nurses care plan   of pulmonary embolism

1. **One of the following diagnoses is given priority as a nursing diagnosis for patients with pulmonary embolism**

 a. Impaired Gas Exchange

 b. Ineffective Breathing Pattern

 c. Deficient Knowledge

 d. Risk for Bleeding

2. **Impaired Gas Exchange in PE May be related to**

 a. Decreased lung perfusion caused by the obstruction of pulmonary arterial blood flow by the embolus.

 b. Alterations in fluid and electrolyte balance

 c. Coughing

 d. Decreased bronchial airflow associated with bronchoconstriction

3. **What is the medication which treat the pulmonary embolism?**

   a. Blood thinners (anticoagulants)

   b. Clot dissolvers (thrombolytics).

   c. Clot removal by surgical procedure

   d. All above

4. **Ineffective Breathing Pattern May be related to Anxiety and fear, Chest pain and Hypoxia . Choose from the following options a nursing intervention appropriate for patients with pulmonary embolism as general ?**

     a. Administer antibiotic as order .

b. Administer antipyretics as ordered.

c. Assess the respiratory rate, rhythm, and depth. Assess for any increase in the work of breathing: shortness of breath, and the use of accessory muscle.

d. Monitor patient for seizures.

5. The following are steps to take care of patients with pulmonary embolism, except?

a. Put the patient on O2 or (ventilator if needed)

b. Assessment of cough and deep breath

c. Changing position of the patient on the bed and making him lie on his back

d. INR and D-dimer monitoring

6. **A client has been diagnosed with a very large pulmonary embolism (PE) and has a dropping blood pressure. What medication should the nurse anticipate the client will need as the priority?**

a. Alteplase (Activase)

b. Enoxaparin (Lovenox)

c. Unfractionated heparin

d. Warfarin sodium (Coumadin)

7. **A 25 year old woman complains of shortness of breath after 10 hours of travel by air. In the Emergency Ward her respiratory rate is 25/min. BP 110/70. P = 90. Pulmonary embolism is suspected. Her D-Dimer is 200 mg/ml fibrinogen units. What is the next step:**

a. Start anticoagulation

b. Order a V/Q scan (Ventilation/perfusion scan)

    c. Order a pulmonary angiogram

    d. Offer reassurance and discharge

8. **A client appears dyspneic, but the oxygen saturation is 97%. What action by the nurse is best?**

   a. Assess for other manifestations of hypoxia.

   b. Change the sensor on the pulse oximeter.

   c. Obtain a new oximeter from central supply.

   d. Tell the client to take slow, deep breaths

9. **A nurse is caring for client who has a new prescription for heparin therapy. What statement by client is an immediate concern for nurse?**

   A. I am allergic to morphine

   B. I take antacids several times a day

   C. I had a blood clot in my leg several years ago

   D. It hurts to take deep breaths

10. **A nurse planning to administer IV alteplase (activase) to a client who is demonstrating manifestations of a massive PE. Which intervention is appropriate for nurse to plan?**

    A. Give IM enoxaparin along with alteplase dose

    B. Hold direct pressure on puncture site for up to 30 minutes

    C. Administer aminocaproic acid (Amicar) IV prior to alteplase infusion

    D. Prepare to administer alteplase within 8 hour of manifestation occurs

11. **The client diagnosed with a pulmonary embolus is in the intensive care unit. Which assessment data warrant immediate intervention**

from the nurse?

1. The client's ABGs are pH 7.36, PaO2 95, PaCO2 38, HCO3 24

2. The client's telemetry exhibits occasional premature ventricular contractions

3. The client's pulse oximeter reading is 90%

4. The client's urinary output for the 12hr shift is 800ml

12. **The client is admitted to the medical unit diagnosed with a PE. Which intervention should the nurse implement?**

1. Administer oral anticoagulants

2. Assess the client's bowel sounds

3. Prepare the client for a thoracentesis

4. Institute and maintain bedrest

13. **The nurse identified the client problem "decreased cardiac output" for the client diagnosed with PE. Which intervention should be included in the plan of care?**

1. Monitor the client's ABGs

2. Assess skin color and temp

3. Check the client for signs of bleeding

4. Keep the client in the Trendelenburg position

Domin 4 Nurses knowledge concerning Complications of pulmonary embolism

1. **The nurse is caring for a patient who had an pulmenary embolisim. Then the patient chest manifestation indicates a complication?**

   a. Slight swelling of the right toes

   b. A rash of small red bumps on the chest

c. Slight pain at the pin site

d. Discomfort in the right lower extremity when repositioning

2. **A 72-year-old patient underwent a hip replacement operation. When evaluating the patient after the operation, the nurse considered one of the following options as complications of the current operation**

      a. Acute pneumonia

      b. Bleeding

      c. Wound infection

      d. Pulmonary embolism

APPENDIX (C)

Arabic Questionnaire

استبانة لتقييم معارف الممرضين تجاه مرض الانصمام الرئوي (الخثرة الرئوية)
في وحدات العناية الحرجة في مستشفيات الحلة التعليمية

الجزء الأول : المعلومات الديموغرافية :

1. **العمر** ....

2. **الجنس : ذكر:** ☐   انثى : ☐

3. **الحالة الزوجية :**   أعزب ☐

   متزوج ☐

   أرمل ☐

   مطلق ☐

4. **التحصيل الدراسي :**
   1. خريج مدرسة تمريض ☐
   2. خريج اعدادية تمريض ☐
   3. خريج معهد تمريض ☐
   4. خريج كلية تمريض/ بكالوريوس ☐
   5. ماجستير ☐
   6. دكتوراه ☐

5. **وحدة العمل (اسم القسم)**................

6. **عدد سنوات الخبرة في مجال التمريض** ....

7. **عدد سنوات االحبره في وحات العنايه الحرجه**................

8. **هل سبق لك المشاركة في دورات تدريبية حول الانصمام الرئوي (الخثرة الرئوية) ؟**

   نعم ☐   لا ☐

APPENDIX (C)

القسم الاول / معارف الممرضين فيما يتعلق بمرض الانصمام الرئوي واسبابه وعوامل الخطورة

1.الانصمام الرئوي هو _____ في لأوعية الدموية المركزية في شرايين الرئتين؟

أ. انسداد

ب.تضيق

ج. ضرر

د. كل ما سبق

2. . ما هو الانصمام الرئوي؟

أ. جلطة دموية تسد الشريان الرئوي

ب. جلطة دموية تسد الشريان الأورطي.

ج. جلطة دموية في الأوردة العميقة للأطراف أو الحوض

د. فشل في الجانب الايمن من القلب

3. ما هو السبب الأكثر شيوعا للانسداد الرئوي؟

أ. فشل القلب الاحتقاني

ب. الحمى النزفية

ج. تجلط الأوردة العميقة

د. الالتهاب الرئوي الحاد

4. أي من الفقرات التالية ليست من أسباب الانصمام الرئوي؟

أ. تجلط الاوردة العميقة

ب. فقاعات هواء

ج. أورام السرطان

د. ارتفاع ضغط الدم

5. النفث الدموي هو _____ .

أ. سعال مع الدم

ب. إفرازات الجيوب الأنفية الدموية

ج. تقيئ دموي

د. كل ما سبق

6. عدم التوازن بين إمداد الدم وتزويد الرئتين بالهواء يسمى _____.

أ. عدم توازن مصل الأكسجين

ب. عدم التوازن في ضخ الدم

ج. عدم تطابق التهوية والتروية

د. نقص تروية عضلة القلب

7. الموقع الأكثر شيوعًا لنشوء الخثرة التي تسبب الانصمامات الرئوية هي _____.

أ. الأوردة العميقة للأطراف السفلية

ب. الحوض

ج. الأذين الأيمن

د. كلا من أ و ب

8. هنالك عدة أسباب للانصمام الرئوي اكثرها شيوعا هو _____ ؟

أ. فقاعات هواء

ب. قطرات دهنية

ج. السائل الذي يحيط بالجنين

د. تجلط الاوردة العميقة

9. جميع الفقرات التالية تعد من عوامل الخطر للإصابة بالانصمام الرئوي ماعدا _____ ؟

أ. عمر الشباب

ب. استخدام وسائل منع الحمل

ج. التعرض لإصابة حديثة أو صدمة في الوريد

د. كسور الورك المؤلمة التي تشل حركة المريض

10. واحد من الخيارات التالية يزيد من خطر الانصمام الرئوي؟

أ. كوفيد 19

ب. امراض القلب

ج. الاضطرابات التي تؤثر على تجلطات الدم

د. كل ما سبق

11. جميع الفقرات التالية تعد من التدابير الصحية التي يجب تعليمها لمريضة التي تستخدم وسائل منع الحمل الهرمونية لمنع حدوث الانصمام الرئوي ماعدا ؟

أ. اخذ المزيد من احماض اوميغا 3 الدهنية.

ب. التوقف عن التدخين .

ج. اجراء تمارين بشكل منظم.

د. الحفاظ على وزن صحي. .

12.تنطوي الإصابة بانسداد رئوي على مخاطر احتمال _____ .

أ. الموت المفاجئ

ب. داء السكري

ج. ضغط دم مرتفع

د. بتر الأطراف

13. من هو الأكثر عرضة للإصابة بالانصمام الرئوي؟

أ. النساء

ب. الرجال

ج. الخطر هو نفسه بالنسبة للرجال والنساء

د. كل ما سبق

14. أي من الخيارات التالية اكثر عرضة للإصابة بالانصمام الرئوي ؟

أ. إصابة الوريد العميق للساق ، مثل الجراحة

ب. عدم الحركة لفترات طويلة

ج. الشباب (أقل من 25)

د. الأول والثاني فقط

15. ممرض يعطي علاج الهيبارين وريديا لمريض انصمام رئوي , ماهي القيمة المختبرية التي تشير الى حدوث اثر جانبي خطير ؟

أ. الهيموجلوبين: 14.2 جم / ديسيلتر

ب. عدد الصفائح الدموية: 82000 / لتر

ج. عدد خلايا الدم الحمراء: 4.8 / مم 3

د. عدد خلايا الدم البيضاء: 8.7 / مم 3

16. ما هي القيمة الطبيعية للصفائح الدموية ؟

أ. 75000 - 150000

ب. 150000- 450000

ج. 500000-450000

د. 180000-80000

القسم الثاني : تقييم معارف الممرضين تجاه العلامات والأعراض والتشخيص للانصمام الرئوي

1. أي من الاعراض التالية تشير الى حدوث الانصمام الرئوي؟

أ. سيصبح لدى المريض تباطؤ في دقات القلب

ب. سيحصل للمريض زيادة في ضغط غاز الاوكسجين داخل الرئة يتم ملاحظتها عند اجراء تحليل غازات الدم الشرياني ABG's

ج. عدم تطابق التهوية والتروية وانخفاض في إنتاج مادة (Surfactant) بالسطح والتي تفرز بواسطة الحويصلات الهوائية لتسهيل التنفس لدى مرضى الرئة

د. لا شيء، لا يظهر على المرضى عادة أي علامات / أعراض سريرية.

2. أي من الأعراض التالية ليست مميزة للانصمام الرئوي؟

أ. ضيق مفاجئ في التنفس.

ب. ألم حاد في الصدر (عادة ما يكون أسوأ مع التنفس).

ج. السعال أو السعال الدموي

د. امتداد ألم الصدر المفاجئ إلى الذراع.

3. بعد اجراء الفحص السريري لمريض يعاني من الانصمام الرئوي بتحديد العلامات والاعراض الظاهره عليه. استعرض الممرض العلامات والاعراض الأكثر شيوعا هي :

أ. الشعور بالحرارة والاحمرار

ب. قشعريرة وحمى مفاجئة

ج. ألم في الصدر يحدث فجأة

د. ضيق التنفس عند أخذ نفس عميق

4. **ادخل مريض الى ردهه الطوارى يبلغ من العمر 67 عام مصاب بسرطان المثانه ويعاني من ضيق التنفس وورم في الساق اليسرى يصاحبه الم شديد مع ارتفاع معدل ضربات القلب 110 نبضه في الدقيقه ماهو خطر الإصابة بالانصمام الرئوي لهذا المريض**

أ. منخفض

ب. معتدل (يحصل المريض على 5.5 نقاط على درجة البئر)

ج. عالي

د. لا يوجد أي احتمال لإصابة المريض بالانصمام الرئوي

5. **الاعراض المبينة ادناه هي اعراض الأنصمام الرئوي ماعدا _____ ؟**

أ. ازدياد قوة وسرعه دقات القلب

ب. دوخة

ج. الجلد المتصلب أو تغير اللون

د. ارتفاع ضغط الدم الرئوي

6. **تعتمد علامات وأعراض الانصمام الرئوي على _____ ؟**

أ. حجم وموقع الخثرة.

ب. حجم الخثرة فقط

ج. كمية الدم التي يمكن أن تتدفق حول الخثرة.

د. حالة الرئتين الصحية للمريض قبل الاصابة

7. **علامات وأعراض الانصمام الرئوي (PE) يمكن ان تشمل ؟**

أ. احمرار ودفء ,والم عند اللمس وتورم في احدى سيقان المريض

ب. ضيق في التنفس، ألم في الصدر، سعال دموي

ج. تشنجات عضلية، دوار، طنين في الأذنين

د. كل ما ورد اعلاه

8- **أي من العلامات التالية أكثر موثوقية في تشخيص الانصمام الرئوي :**

أ. معدل النبض

ب. معدل التنفس

ج. ضغط الدم

د. لا شيء مما سبق

9. ماهي الإجراءات المناسبة لمريض شاب يتمتع بصحه جيده ومصاب بالانصمام الرئوي وليس لديه عوامل مساعده للإصابة بالانصمام الرئوي ؟

أ. تشجيع المريض على المشي 5 دقائق كل ساعة.

ب. التحدث الى المريض للإقلاع تماما عن التدخين.

ج. تعليم المريض عن أهمية اجراء اختبار العامل الخامس لايدن (factor V Leiden testing).

د. اخبار المريض أنه في بعض الأحيان لا يتم العثور على سبب للمرض بسهولة.

10. جميع العلامات والاعراض التالية يتوقع حدوثها للمريض المصاب بالانصمام الرئوي ماعدا _____ ؟

أ. بطء التنفس (Bradypnea)

ب. فرك الاحتكاك الجنبي (صوت خشن عند الزفير)

ج ـ نمشات (بقع حمراء / أرجوانية على منطقة الصدر)

دـ تسارع في دقات القلب

11. لماذا لا يتحسن تشبع الاوكسجين بشكل ملحوظ لمريض يعاني من انصمام رئوي حاد ؟

أ. التنفس بسرعة يتعارض مع الأوكسجين.

ب. ربما المريض يعاني من متلازمة الضائقة التنفسية.

ج. وذلك بسبب تتداخل الجلطة الدموية مع التروية في الرئتين.

د. لان المريض يحتاج إلى التنبيب الفوري والتهوية الميكانيكية.

12. يخضع المريض لأجراء التنبيب الرئوي لمده 40 ثانيه. ما هو العمل اكثر اهميه الذي يقوم به التمريضي اثناء اجراء عمليه التنبيب الرئوي _____ ؟

أ. تتأكد من أن المريض لديه التخدير الكافي.

ب. تبحث عن مزود آخر للتنبيب.

ج. تقطع الإجراء (تنبيب المريض) لإعطاء الأكسجين.

د. مراقبة تشبع الأكسجين للمريض.

13. عند انخفاض نسبة تشبع الأوكسجين لمريض لديه أنبوب رئوي إلى 88٪. ما هو الاجراء الأهم الواجب اتخاذه من قبل الممرض ؟

أ. تحدد ما إذا كان الأنبوب ملتويًا.

ب. تأكد من أن جميع الوصلات هي ظاهرة.

ج. الاستماع إلى أصوات الرئة للمرضى باستعمال السماعة الطبية.

د. شفط الأنبوب الرغامي

القسم الثالث: تقييم معارف الممرضين تجاه الرعاية التمريضية والعلاجية لمرضى الانصمام الرئوي

1. أي من عبارات التشخيص التمريضي التالية تعطي الأولوية للمرضى المصابين بالانصمام الرئوي ؟

أ. تبادل الغازات المتعثرة

ب. نمط التنفس غير الفعال

ج. المعرفة الناقصة

د. خطر حدوث نزيف

2. فشل التبادل الغازي هو تشخيص تمريضي لمريض الصمة الهوائية قد ينتج عن ؟

أ. انخفاض نضح الرئة بسبب انسداد تدفق الدم الشرياني الرئوي بواسطة الخثرة.

ب. تغيرات في توازن السوائل والالكترولايت (الشوارد الكهربائية)

ج. السعال

د. انخفاض تدفق الهواء في الشعب الهوائية المرتبط بتضيق الشعب الهوائية

3. ما هو الدواء الذي يعالج الانصمام الرئوي؟

أ. مخففات الدم (مضادات التخثر)

ب. مذيبات الجلطة (الحالة للخثرة).

ج. إزالة الجلطة عن طريق الجراحة

د. كل ما سبق

4. نمط التنفس غير الفعال قد يكون مرتبطا بالقلق والخوف وألم في الصدر ونقص الأوكسجين. اختر من بين الخيارات التالية تدخلاً تمريضًا يعد مناسبًا لمرضى الانصمام الرئوي بشكل عام .

أ. إعطاء العلاجات مضادة الالتهاب .

ب. اعطاء خافضات الحرارة على النحو المطلوب وحسب تعليمات الطبيب.

ج-تقييم معدل التنفس وايقاع النفس (منتظم او غير منتظم) وعمق النفس. مع عمل تقييم أي زيادة في عمل التنفس: ضيق في التنفس ، واستخدام العضلات الملحقة.

د-مراقبة المريض خوفا من حدوث النوبات.

5الاجراءات التاليه هي حطوات للعنايه لمرضى الانصمام الرئوي ماعدا ؟

أ. وضع المريض على O2 أو (جهاز التنفس الصناعي إذا لزم الأمر)

ب. تقييم السعال والنفس العميق

ج. تغيير وضعية نوم المريض على السرير وجعله مستلقيا على ظهره

د. مراقبة INR و D-dimer

6. تم تشخيص إصابة أحد المرضى بانسداد رئوي كبير جدًا ولديه انخفاض في ضغط الدم. ما هوه الدواء الذي يجب أن يتوقعه الممرض أن المريض يحتاجه بشكل عاجل ؟

أ. التيبلاز (أكتيفاز)

ب. إينوكسابارين (لوفينوكس)

ج. الهيبارين غير المجزأ

د. الوارفارين الصوديوم (كومادين)

7. امرأة في الخامسة والعشرين من العمر تشكو من ضيق في التنفس بعد 10 ساعات من السفر جوا. دخلت الى جناح الطوارئ ، معدل تنفسها 25 / دقيقة. وكان نبض قلبها 90 ضربة / دقيقة. وعند قياس ضغط الدم كان 110/ 70 ملم/زئبق . أيضا تم اجراء فحص ال دي ديمر (D-Dimer) كان 200 ملغ / مل من وحدات الفيبرينوجين ... يشتبه في حدوث انسداد رئوي لها. ما هي الخطوة التالية:

أ. ابدأ بالعلاج الذي يمنع تخثر الدم

ب. اطلب فحص V / Q (فحص التهوية / التروية)

ج. اطلب تصوير الأوعية الرئوية

د. تقديم المشورة للمريض

8. دخل مريض الى ردهه الطوارئ ظهرت عليه علامات ضيق النفس، ولكن قراءة الأكسجين هو 97٪. ما هو أفضل اجراء يقوم به الممرض في هذه الحالة؟

أ. تقييم علامات واعراض نقص الأكسجة الأخرى.

ب. تقوم بتغيير المستشعر الموجود على مقياس التأكسج النبضي.

ج. احصل على مقياس تأكسج جديد من الإمداد المركزي.

د. أخبر المريض أن يأخذ أنفاسًا بطيئة وعميقة

9. ممرض يعتني بمريض لديه وصفة طبية جديدة لعلاج الهيبارين. أي من العبارات التالية تمثل مصدر قلق فوري للممرض؟

ا. لدي حساسية من المورفين

ب. أتناول مضادات الحموضة عدة مرات في اليوم

ج. أصبت بجلطة دموية في ساقي منذ عدة سنوات

د. أتألم عندما اخذ نفسا عميقا

10. ممرض يخطط لإعطاء علاج (Alteplase(activase لمريض تظهر عليه اعراض الانصمام الرئوي . ماهوه التداخل التمريضي المناسب لهذه الحالة ؟

أ. إعطاء إينوكسابارين IM مع جرعة التيبلاز

ب. استمر في الضغط المباشر على موقع الحقن لمدة تصل إلى 30 دقيقة

ج. اعطاء حمض أمينوكابرويك IV (Amicar) قبل ضخ التيبلاز

د. الاستعداد لإعطاء علاج التيبلاز في غضون 8 ساعات من ظهورها

11. المريض المصاب بالصمة الرئوية موجود في وحدة العناية المركزة. ما هي بيانات التقييم التي تتطلب التدخل الفوري من الممرض ؟

1. ABG للمريض هي pH 7.36، PaO2 95، PaCO2 38، HCO3 24

2. يعرض القياس عن بعد المريض تقلصات بطينية مبكرة من حين لآخر

3. قراءة مقياس الأكسجة النبضي للمريض 90٪

4. الطرح البولي للمريض في كل 12 ساعة هو 800 مل

APPENDIX (C)

12. ادخل المريض في ردهه الباطنية وتم تشخيص إصابته بـالانصمام الرئوي. ما التدخل الذي يجب على الممرض تنفيذه؟

1. اعطاء مضادات التخثر الفموية

2. تقييم أصوات أمعاء المريض

3. تحضير المريض لعملية بزل الصدر(فغر الصدر بالإبرة)

4. البقاء والحفاظ على راحة المريض في الفراش

13. حدد الممرض مشكلة المريض "انخفاض كمية الدم الخارج من القلب" (decreased cardiac output) للمريض المصاب بالانصمام الرئوي. ما التدخل الذي يجب تضمينه في خطة الرعاية التمريضية ؟

1. مراقبة ABG للمريض

2. تقييم لون البشرة ودرجة الحرارة

3. افحص المريض بحثًا عن علامات النزيف

4. احتفظ بالمريض في وضع Trendelenburg (الجسم مستلق أو مسطح على الظهر على منحدر 15-30 درجة مع رفع القدمين فوق الرأس)

القسم الرابع : تقييم معارف الممرضين تجاه مضاعفات الانصمام الرئوي

1. الممرض يقدم العلاج لمريض انصمام رئوي ثم تظهر اعراض تنفسية على المريض تشير الى حدوث مضاعفات فما هي ؟

أ. تورم طفيف في أصابع القدم اليمنى

ب. طفح جلدي من نتوءات حمراء صغيرة على الصدر

ج. ألم خفيف في موقع الدبوس

د. عدم الراحة في الطرف الأيمن السفلي عند تغيير الوضع

APPENDIX (C)

2. مريض يبلغ من العمر 72 سنة قام بعمل عملية استبدال لمفصل الورك , عند عمل تقييم للمريض بعد العملية الممرض اعتبر احد الخيارات التالية هي مضاعفات للعملية الحالية

ا. الالتهاب الرئوي الحاد

ب. النزف

ج. التهاب الجرح

د. الانسداد الرئوي

APPENDIX (D)

Panel of Experts

قائمة بأسماء خبراء الاستبانة

سنوات الخبرة	الاختصاص	مكان العمل	اللقب العلمي	اسم الخبير	ت
40	جامعة بابل/كلية التمريض	تمريض صحة البالغين	استاذ	د. فخرية جبر	1
36	جامعة الكوفة/كلية التمريض	تمريض صحة البالغين	أستاذ	د.راجحة عبد الحسن حمزة	2
33	جامعة بغداد/كلية التمريض	تمريض صحة البالغين	أستاذ	د.هدى باقر حسن	3
18	جامعة بغداد/كلية التمريض	تمريض صحة البالغين	أستاذ	د.حسين هادي عطية	4
27	جامعة كربلاء/كلية التمريض	تمريض صحة البالغين	أستاذ مساعد	د.فاطمة مكي محمود	5
25	جامعة بابل/كلية التمريض	تمريض صحة البالغين	أستاذ مساعد	د.سحر ادهم علي	6
23	جامعة بابل/كلية التمريض	تمريض صحة البالغين	أستاذ مساعد	د. شذى سعدي محمد	7
17	جامعة كربلاء/كلية التمريض	تمريض صحة البالغين	أستاذ مساعد	د.حسن عبد الله عذبي	8
10	جامعة بغداد/كلية التمريض	تمريض صحة البالغين	أستاذ مساعد	د.صادق عبد الحسين حسن	9

الخلاصة

الانصمام الرئوي هو السبب الثالث الأكثر شيوعا للموت بعد امراض الشرايين التاجية والسكتة الدماغية. منع تكوين وتطور التجلطات هوة دور تمريضي رئيسي لذلك فان أفضل علاج للانصمام الرئوي هي من خلال الوقاية من عوامل الخطروأيضا من خلال وجود ملاك تمريضي مؤهلين تأهيلا عاليا.

تهدف هذه الدراسة إلى تقيم معارف الممرضين بمرض الانصمام الرئوي في وحدات العناية الحرجة، وتحديد العلاقات بين معارف الممرضين وبعض المتغيرات الديموغرافية.

أجريت دراسة وصفية باستخدام عينة غرضية (غير احتمالية) متكونة من (112) ممرض وممرضة ممن يعمل في وحدات العناية المركزة. هذه العينة موزعة على ثلاثة مستشفيات تابعة لدائرة صحة بابل. حيث تضمنت الاستبانة (44) سؤال موزعة على أربعة اقسام. تم التحقق من مصداقية الاستبيان من خلال اجراء دراسة تجريبية وعرضها على قائمة الخبراء في مجال تمريض صحة البالغين حيث تم جمع البيانات من خلال استخدام طريقة الابلاغ الذاتي والاستبيان. يتم تحليل البيانات من خلال تطبيق نهج تحليل البيانات الاحصائي الوصفي والاستنتاجي.

كشفت نتيجة الدراسة أن معارف الممرضين فيما يتعلق بالتعريف والأسباب وعوامل الخطر للانصمام الرئوي كانت متوسطة المعرفة. في حين أن تقيم المعارف من حيث العلامات والأعراض والاختبار التشخيصي والعلاج وخطة الرعاية التمريضية والمضاعفات، أظهرت الممرضين على مستوى ضعيفًا من المعرفة. كانت المعرفة الاجمالية للممرضين ضعيفة المستوى. كانت هناك علاقة ذات دلالة إحصائية بين معارف الممرضين وتحصيلهم الدراسي، وسنوات الخبرة في وحدات العناية الحرجة، والدورات التدريبية عند قيمة.$p < 0.05$

الخلاصة والتوصيات: تساعد سنوات الخبرة الإضافية في وحدة العناية المركزة وتدريب الممرضين على حالات الانصمام الرئوي في رفع مستوى العلمي والمهني للممرضين. توفير الموارد الصحية واستغلال الطاقات الشبابية للممرضين مما يساعد بالفعل على تنمية معارفهم تجاه المرض.

وزارة التعليم العالي والبحث العلمي

جامعة بابل/ كلية التمريض

تقييم معارف الممرضين تجاه مرض الانصمام الرئوي في وحدات العناية الحرجة لدى مستشفيات الحلة التعليمية

رسالة مقدمة الى

مجلس كلية التمريض

كجزء من متطلبات نيل درجة الماجستير علوم في التمريض

تقدم بها الطالب

احمد علي عبد الهادي

بأشراف

ا.م.د حسام عباس داود

ذي الحجة/ 1443 هـ   تموز 2021 مـ