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NEAR EAST UNIVERSITY

INSTITUTE OF HEALTH SCIENCES

KNOWLEDGE AND PRACTICES OF NURSES ABOUT DEEP VEIN THROMBOSIS (DVT) RISKS AND PROPHYLAXIS

Khalid Al-Mugeed

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Advisor:

Prof. Dr. Nurhan Bayraktar

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APPROVAL

The Directorate of Graduate School of Health Sciences, This study has been accepted by the thesis committee in nursing program as a master of emergency nursing thesis.

Thesis Committee:

Chair: Assoc. Prof, Ümran DAL YILMAZ (Near East University).

Member: Profosser. Nurhan BAYRAKTAR (Near East University).

Member: Assist.Prof, Gülten SUCU DAĞ (Eastern Mediterranean University).

Approval:

According to the relevant article of the Near East University Postgraduate Study-Education and Examination Regulation, this thesis has been approved by the above-Mentioned members of the thesis committee and the decision of the board of Directors of the Institute.

Professor, K. Hüsnü Can BAŞER
Director of Graduate Institute of Health Sciences

DECLARATION

I hereby declare that the work in this thesis entitled **"Knowledge and Practices of Nurses about Deep Vein Thrombosis (DVT) Risks and Prophylaxis."** is the study of my own research efforts undertaken under the supervision of **Prof. Dr. Nurhan Bayraktar.**

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Knowledge and Practices of Nurses about Deep Vein Thrombosis (DVT) Risks and Prophylaxis

ABSTRACT

Introduction: Deep vein thrombosis (DVT) is a common problem affecting the patients and may cause to potentially life threatening complications. There is a need to increase knowledge and awareness of nurses on DVT risks and prevention to avoid complications.

Objectives: The aim of the study is determination of the knowledge and practices of DVT risks and prophylaxis among nurses.

Methods: This descriptive study was conducted on the registered nurses who work in the Near East University Hospital. Total 165 voluntary nurses were composed the sample of the study. A questionnaire that was developed by the researchers on the basis of the literature was used as data collection tool in this study. Data were collected using a questionnaire in July 2017, after the ethical approval. Descriptive statistics and Pearson Chi-Square tests were used in analysis of the data.

Results: Results of the study showed high level knowledge of nurses only in general knowledge on DVT. Whereas nurses had inadequate knowledge on DVT risk factors, preventive measures and poor practices of DVT prevention. It was also determined that there were statistically significant differences in terms of educational levels and experiences of the nurses with different items at risk factor, prevention and practices on DVT.

Conclusions: Based on the results of the study implementation of comprehensive, systematic, and continuous educational programs in order to enhance the knowledge and practices of the nurses on DVT was recommended.

Keywords: Deep vein thrombosis, venous thromboembolism, risk factors, preventive measures, nursing

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List of Abbreviations

Items of Abbreviations	Context
DVT	Deep Vein Thrombosis
PTC	Post-thrombotic Syndrome
PE	Pulmonary Embolism
CTPH	Chronic Thromboembolic Pulmonary Hypertension
VTE	Venous Thromboembolism
IPC	Intermittent Pneumatic Compression
GCS	Graduated Compression Stockings
IRB	Institutional Reviews Board
LMWH	Low Molecular Weight Heparin

1. INTRODUCTION

1.1 Problem Definition

Thrombotic disorders are a leading cause of morbidity and mortality worldwide (Korubo, et al 2015). The deep vein thrombosis (DVT) and venous thromboembolism (VTE) are among the most serious risks to patients. World Health Organization (WHO) reports a global rise in mortality from non-communicable diseases and up to 80% of deaths from non-communicable diseases occurs in developing countries (WHO 2015). VTE is the third leading vascular diagnosis after heart attack and stroke (American Heart Association-AHA 2017). There is increasing prevalence of obesity and metabolic disorders such as diabetes mellitus which are all predisposing risk factors for the development of DVT/VTE; there is also better availability of diagnostic facilities for detecting VTE and therefore the prevalence of VTE is on the increase (WHO 2015).

Deep vein thrombosis is a common problem affecting both ambulatory and hospitalized patients. The reported incidence of DVT varies between 48/100,000 and 160/100,000. Also the report from Centre for Disease Control and Prevention (CDC) puts VTE related mortality in United States (U.S) to be approximately 60,000─100,000 annually and proximately 5-8% of the U.S population has one of several genetic risk factors for developing DVT (CDC 2014). Hospital acquired VTE is a relatively common occurrence and this is known to account for as much as 75% of all VTE related deaths with half the cases occurring soon after hospitalization for surgery or medical illness (Cohen et al 2007).

DVT is a blood clot that commonly occurs in the lower limbs (Blann et al 2006; Korubo, et al 2015; Bevis et.al 2016). It is often asymptomatic and under diagnosed leading to long term complications particularly hence it is often called a ‘silent killer’ (Blann et al 2006). Venous thromboembolism is compliable disease and can cause to potentially life threatening complications. VTE is a fatal complication of DVT and important preventable cause of morbidity and mortality among hospitalized patients (Emeka et al 2011).

Complications such as pulmonary embolism (PE), and chronic complications, including the post thrombotic syndrome and recurrent DVT have significant social and economic impacts (WHO 2010; Emeka et al 2011; Kafeza1 2016).

Pulmonary embolism is the third most common cause of mortality in all age groups, with more prevalence in adults. Despite the advances in the medical diagnosis and treatment, the rate of the diagnosed cases is indeed much less than the actual prevalence of pulmonary embolism (Agharezaeia et al 2014).

There are many factors that can increase risk of developing DVT including ischemic stroke, self or family history of DVT/VTE, immobility, obesity, pregnancy or postpartum period, varicose veins, smoking, oral contraceptives or hormone replacement therapy, decompensated cardiac failure, active cancer, cancer treatment, lung diseases, acute on chronic inflammatory disease, age> 60 years, hip or knee arthroplasty, major trauma and major surgery. All of these factors may contribute increase the risk of DVT/VTE (Kearon 2012).

Prevention of DVT requires both identifying which patients are at risk and choosing an appropriate method of prophylaxis. National Institute for Health and Care Excellence (NICE-UK) recommends assessing a patient's risk of VTE within 24 hours of hospital admission and whenever the clinical situation changes (NICE 2010). Prevention of DVT can include one or both of mechanical or pharmacological measures. Mechanical methods of prophylaxis include use of elastic compression stockings, intermittent pneumatic compression (IPC), and foot compression devices. Pharmacological prophylaxis includes use of heparin and low molecular weight heparin (LMWH). Early mobilization following surgery is paramount and any intervention that facilitates this will help reduce perioperative DVT. Adequate hydration is also fundamental (Ravindra et al 2015).

Nurses can play a major role in DVT/VTE prevention if well-educated and empowered to improve patient's outcome. The nurses need to instruct the patients about dealing, management prophylaxis venous thromboembolism and most complications. Nurses have important roles in acting as an advocate for the patient by helping him or her to access information relevant to his or her condition. Ensuring the patient is fully informed will increase the individual's confidence, and better prepare him or her for any action that may need to be taken in future (Institute for Innovation and Improvement 2008).Nursing is the largest professional group involved in direct clinical care within the healthcare system. Nurses with expert knowledge and strong leadership skills can have a prominent role in influencing and implementing changes to healthcare practices (Schober 2007; Collins et al 2010).

There is a growing awareness of DVT/VTE that is an important public health problem, as concluded by a combined American Public Health Association (APHA) and Centers for Disease Control and prevention (CDC) Public Health Leadership Conference in 2003 and the Surgeon General's Workshop on DVT in 2006. They have raised the question of whether a systematic approach to surveillance of DVT/VTE should be undertaken to provide more generalizable data on disease incidence, refine the current understanding of risk factors and the impact of changes in clinical practice on disease incidence, and provide updated information on the implementation in clinical practice of established preventive measures (American Public Health Association 2003).

Study conducted by Jung-Ah Lee et al (2014) evaluating hospital nurses' perceived knowledge and practices of venous thromboembolism assessment and prevention. They showed poor or fair of VTE risk assessment at overall knowledge and recommended to revisit in-service continuous education about VTE risk assessment especially in acute care settings. Fangfei et al (2010) performed a study on thromboprophylaxis awareness among hospital staff that revealed 10% of nurses and pharmacists were not aware of current guidelines. Researchers recommend improving staff knowledge and attitude towards thromboprophylaxis by reinforcing educational programmers. Jed et al (2013) noticed no measurable improvements in VTE prevention practices of nurses.

There is a need to increase knowledge and awareness of nurses on DVT risks and prevention to avoid complications. Determination of knowledge and practices of nurses on DVT risks and prevention may be useful in improving their awareness and preventing this important public health problem. However a study was not found in the Turkish Republic of Northern Cyprus about this subject.

1.2 Aim of the Study

The aim of the study is determination of the knowledge and practices of DVT prophylaxis among nurses. Study questions include followings:

- What are knowledge of nurses on DVT risks factors and prevention?
- What are practices of nurses on DVT risks factors and prevention?
- Is there any correlation between descriptive characteristics, and knowledge and practices of nurses on DVT risks factors and prevention?

2. BACKGROUND OF THE STUDY

2.1. Definition of DVT

Venous thrombosis is a condition in which a blood clot (thrombus) forms in a vein and manifests clinically as deep vein thrombosis (House of Commons Health Committee 2005). VTE is a disease that encompasses deep vein thrombosis and pulmonary embolism (Chan Drakumar, et al 2015). A thrombus becomes an embolus if it dislodges from its site of origin to enter the circulation, ultimately impacting in another vascular bed (John et al 2010). PE occurs if the clot breaks off from the site in which it was created and lodges in the lung vessels (House of Commons Health Committee 2005).

Virchow described pathophysiology of deep vein thrombosis that were in three category including hypercoagulability, injury and venous stasis. DVT manifests commonly in the deep veins of the legs, thighs and pelvis (House of Commons Health Committee 2005). In the legs and pelvis, DVTs were divided by anatomic location into proximal if the popliteal vein or more central veins were affected and distal if only calf veins were affected (Barnes GD, et al 2014; Brownson et al 2017). In the upper extremities, DVT usually involves the axillary and/or subclavian veins, most often in patients with malignancy and/or indwelling venous catheters (Barneset al 2014). Oftentimes, VTE remains asymptomatic and underdiagnosed, culminating in chronic complications and truncated survival (Chan drakumar, et al 2015).

VTE comprising deep vein thrombosis and pulmonary embolism, represents a major public health problem, with an annual incidence of more than 1 in 1000 (Crowley et al 2017). VTE is also linked to the development of a number of debilitating chronic cardiopulmonary and vascular health conditions such as pulmonary hypertension and post thrombotic syndrome. With aptitude to produce significant morbidity and mortality, they jointly pose a global health concern (Mason C 2009).

2.2. Complications of DVT

Complications are more common after a DVT in the upper extremities than in the lower (Karen 2015). PE occurs between 6% and 10% of cases after a DVT in an upper extremity and in 15%–32% of cases after DVT in a lower extremity (Qaseem et al 2007). Untreated proximal leg DVTs will progress to pulmonary embolism at a rate estimated to be about 50% (Morrison R 2006).

2.2.1 Post-thrombotic Syndrome

The post-thrombotic syndrome (PTS), the most common chronic complication of deep vein thrombosis (DVT) affects approximately 50% of patients (Comerota et al 2014). It can occur in more than one third of patients with DVT. Severe post-thrombotic syndrome may develop in 5-10% of patients with a DVT and this may manifest in the development of venous leg ulcers (Kahn 2009). It is a condition that follows symptomatic deep vein thrombosis and is associated with swelling and edema of the leg, itching, ectatic veins, feeling of heaviness, cramps, pain, and paresthesias (Shapiro et al 2014). Post-thrombotic Syndrome develops in 20–40% of patients with DVT, most commonly in patients with iliofemoral DVT (Creager et al 2013).

2.2.2 Pulmonary Embolism (PE)

A PE occurs when there is an obstruction in the pulmonary artery or its branches in the lungs, most often is the result of a clot in the leg either breaking away or part of it breaking off and moving from the vein to the lungs (Collins et al 2010). Also it is obstruction of the pulmonary arterial tree with abnormal material (thrombus, tumour, air or fat) (Jane et al 2016). A PE can cause chest pain, bloody sputum, shortness of breath and heart failure (National Health and Medical Research Council 2012). Pulmonary embolism (PE), is a common and serious condition for which the treatment has historically been exclusively hospital-based (Roy et al. 2017). PE can range from small, asymptomatic blood clots to large emboli that can occlude the pulmonary arteries causing sudden cardiovascular collapse and death (Nicholas et al 2017).

2.2.3 Chronic Thromboembolic Pulmonary Hypertension

Chronic thromboembolic pulmonary hypertension (CTEPH) is mean pulmonary artery pressure more than 25 mmHg with a pulmonary capillary wedge pressure less than 15 mmHg. Chronic thromboembolic pulmonary hypertension is classified as Group 4 pulmonary hypertension by the World Health Organization (Simonneau et al 2013). It is resulting from occlusion of large pulmonary arteries with a fibro-thrombotic material and in many cases, the development of a distal vessel arteriopathy that closely mimics pulmonary arterial hypertension (Ivan et al 2017). CTEPH is generally felt to be the result of the usual mechanisms of acute PE, but with ineffective clot resolution (Lang et al 2013). Patients commonly present with symptoms of dyspnea, occasional chest discomfort, syncope, and lower extremity edema (Justin et al 2017).

CTEPH is characterized by the presence of organized fibrotic thrombi in the pulmonary arteries causing occlusion, the presence of bands and webs, and there may be partial re-canalization (Lang 2015). CTEPH is a rare late outcome of acute pulmonary embolism (PE) and is associated with significant morbidity and mortality (Madani et al 2014).

2.3. Risk Factors for VTE

There are many risk factors that contribute of developing deep vein thrombosis. Hospital inpatients and surgery and obese are major risk factors for VTE. Immobilization has been described as a major risk factor for VTE, especially in elderly populations over 70 years of age (Engbers et al 2015). Patients who have had a stroke are at especially high risk; in prospective studies, venous thromboembolism has been detected in 20–42% of patients in hospital who have had a stroke (CLOTS 2010). The remaining episodes are caused (provoked) by transient or persistent factors that additively or multiplicatively increase the risk of venous thromboembolism by inducing hypercoagulability, stasis, or vascular wall damage or dysfunction, (Heit JA 2015). According to (Heit JA 2015) the risk factors for venous thromboembolism it's includes two categories: Clinical and environmental risk factors, heritable risk factors. Typically, most health practitioners assess DVT risk in patients based on their own experience, which is not appropriate for clinical assessment (Cui et al 2009).

According to Padua Prediction Score (PPS) following is risk assessment model suggested to use for medical patients (Barbar et al 2010):

Risk Factor	**Score**
Active cancer	3
Previous VTE (with the exclusion of superficial vein thrombosis)	3
Reduced mobility (at least 3 days)	3
Diagnosed thrombophilia	3
Recent trauma and/or surgery (<1 month)	2
Age (>70 years)	1
Heart and/or respiratory failure	1
Acute myocardial infarction or ischaemic stroke	1
Acute infection and/or rheumatological disorder	1
Obesity (BMI ≥30)	1
Ongoing hormonal treatment	1

National Institute of Health and Care Excellence (NICE 2015) recommends assessing a patient's risk of bleeding and VTE within 24 hours of hospital admission and whenever the clinical situation changes. Although our knowledge of risk factors has increased over the past decades, a third to a half of venous thromboembolism episodes do not have an identifiable provoking factor and are therefore classified as unprovoked (Ageno et al 2016; Kearon et al 2016).

All of these risk factor that increase VTE risk depend of the type of surgery such as ; a prior history of VTE, familial major thrombophilia, cancer, chemotherapy, cardiac or respiratory failure, hormone therapy, oral contraception, stroke with neurological deficit, post-partum status, age, obesity, and prolonged bed rest (Samama et al 2011).

2.4. Prophylaxis for VTE

The initial objectives for the VTE management it is prevent of clot extension, prevention of PE, reducing of later risk complications. Prophylaxis for VTE includes early mobilization after surgery, intermittent pneumatic compression, graduated compression stockings, inferior vena cava filters and anticoagulants (Emeka et al 2011). Researchers suggest that health practitioners should focus on DVT prophylaxis in addition to using an effective risk assessment tool to identify high-risk patients, and implement the appropriate measures to decrease the morbidity rate effectively (Qiu et al 2013). During post-operative care, the early mobilization is primary intervention; this will decrease risks to DVT and PE. VTE prophylaxis appropriate that contribute reduce the morbidity and mortality. Prevention process of VTE it is consist of mechanical or pharmacological methods. However, prevention requires form health care providers identify patients risky and select a suitable method of treatment. Treatment with anticoagulation or intermittent pneumatic compression and graduated compression stockings will reduce the risk of VTE. In 2013, the International Union of Angiology (IUA) generated a consensus statement that recommended pharmacological thromb-prophylaxis or mechanical thromboprophylaxis in moderate- risk patients. (Nicolaides et al 2013).

2.4.1 Mechanical Prophylaxis

It is physical prophylaxis methods recommended for patients in deep vein thrombosis or for whom cannot enhance by anticoagulant therapy to improve circulation and reduce of complications.

Mechanical VTE prophylaxis was suggested for actively bleeding patients or those at high risk of bleeding with consideration of initiation of pharmacologic methods once the bleeding or its risk decreased (Rajiv et al 2012). The patients should be measured and wearing compression stockings comfortable as fit appropriate to get properly treatment.

2.4.2. Intermittent Pneumatic Compression (IPC)

IPC simulates the normal ambulatory pumping action of the thigh and calf through a cycle of balloon inflation-deflation to increase the venous blood flow rate, eliminate venous stasis and reproduce the effects of the natural muscle pump (Talec et al 2016). Immediate application of IPC for patients with contraindication to pharmacological protection is best practice and should be used until combined therapy can be initiated. (Nancy et al 2017). During IPC blood is artificially moved proximally to prevent stasis and increase the effects of fibrinolysis with the use of an external controller and sleeves/cuffs (Mehmet et al 2013). A meta-analysis concluded that IPC therapy of the lower limbs can be as effective as pharmacological thromboprophylaxis (Ho K, Tan J 2013). The aim of IPC is to promote venous blood flow and fibrinolytic activity and reduce recurrence VTE.

2.4.3. Graduated Compression Stockings (GCS)

GCS acts as an external layer of muscle, compressing the veins with decreasing circumferential pressure from the ankle to the thigh (8e18 mm Hg), so aiding the propulsion of blood from distended veins towards the right atrium. They should be worn by all surgical patients until independent mobilization is achieved, unless contraindicated (Sachdeva et al 2014). Although the effectiveness of stockings is now in doubt, they have limited local side-effects and should be considered for relieving symptomatic swelling in patients with proximal deep vein thrombosis (Kahn et al 2014). Although the exact mechanism of action of GCS remains unclear, it is believed that GCS reduce the total cross-sectional area of the leg veins, thereby increasing venous blood flow velocity and preventing venous stasis in the lower limbs (Laryea et al 2013). Practical evidence role of stuff nursing that play in prepared the compression stockings, commencing with apply the stockings, measurement circumference to be fit perfect.

2.4.4. Caval Filters

Inferior vena cava filters are indicated in patients who have absolute contraindications to anticoagulation, such as those with active bleeding or with objectively confirmed recurrent pulmonary embolism despite adequate anticoagulant treatment (Kearon et al 2016). Filters should not routinely be added to anticoagulation in patients with poor cardiopulmonary reserve or high risk of pulmonary embolism since they do not reduce the risk of recurrent pulmonary embolism (Mismetti et al 2015).

2.4.5. Pharmacological Prophylaxis

Pharmacological prophylaxis is the mainstay of prevention and treatment of VTE. However, not all the newer agents have been studied in all patient groups or surgical procedures and variations in dose are required in different situations (Ravindra et al 2015). Although thromboprophylaxis can reduce the incidence of VTE in hospitalized patients, it remains underused because of fear of bleeding (Maynard G 2015).

2.4.6. Anticoagulant Therapy

Anticoagulant therapy is the mainstay for the treatment of venous thromboembolism and is classically divided into three phases: the acute phase of the first 5–10 days after venous thromboembolism diagnosis, a maintenance phase of 3–6 months, and an extended phase beyond this period (Wells et al 2014). Unfractionated heparin needs dose adjustments based on activated partial thromboplastin time results, whereas weight-adjusted low-molecular-weight heparins can be given in fixed doses without monitoring. Low molecular- weight heparins are preferred over unfractionated heparin because of both superior efficacy and safety (Castellucci et al 2014). It act with prohibit factor Xa and effect than Low-dose unfractionated heparin.

It is the recommended first choice as prophylaxis after orthopaedic surgery (Falck-Ytter et al 2012). However (LMWH) recommend in the first line and critical primary anticoagulation prescribed treatment for deep vein thrombosis.

This is due to advantages of better bioavailability and no need for lab monitoring of the intensity of anticoagulation or dose adjustment, compared to warfarin or unfractionated heparin (Testroote et al 2011). The dose and administration time of anticoagulants must be well known to minimize both the risk of thrombosis and also of hemorrhage (Gaujoux et al 2016).

2.5. Nursing Interventions and Roles

Nurse is key component of any deep vein thrombosis to prevent and reduce the complications by health education material regarding mechanical, pharmacological prophylaxis and risk factor. Nurses who provide care at the patient bedside may be the first health care providers to identify risks for VTE and to respond (Jung-Ah Lee et al 2014). Early ambulation, range of motion, reassessment of VTE risk factor and appropriate nursing interventions that lead to reduce hospitalized patients and improve for VTE prophylaxis. Stuff nurses are more responsible in assessing patients' awareness and administering prophylaxis for VTE. Nurses are responsible to educate and inform the family, patient's related best practice of mechanical prophylaxis also central key for endorsing applying and reapplying physical treatment devices. Medications route of low-molecular-weight heparin is subcutaneous injection the nursing staff should be provide and teach patients regarding anatomical sites administering injection as practical knowledge. Mechanical prophylaxis have been found to improve venous circulations and reduce recurrence such as pulmonary embolism and post-thrombotic syndrome. However all patients should be receive the fit perfect size of stocking and follow fitting anti-embolism stockings instructions. If complications occur, many are easily overcome degree of compression (Chung et al 2014). Roles of nurses to management of venous thromboembolism and mechanical prophylaxis include:

- Providing information to patients and/or relatives about risks and prevention of DVT.
- Encouraging patients to do foot and leg exercises by themselves or relatives help if patients are unable to do so.
- Encouraging early ambulation of surgical patients.
- Assessing the DVT risks of patients the regularly.
- Administering anticoagulants as preventive in clinic.
- Monitoring the side effects of the anticoagulants.
- Educating the patients on anticoagulants.
- Educating the patients to avoid injury.
- Encouraging patients to do elevate legs.
- Educating the patients on sufficient fluid intake.
- Using of the graduated compression stockings.
- Teaching the patients about proper use of graduated compression stockings.
- Assessing the patients regularly for signs and symptoms of DVT/VTE.

3. METHODOLOGY

3.1 Study Design

The study was planned as descriptive design.

3.2 Study Setting

The study was conducted at the Near East University Hospital, North Cyprus. The Near East University Hospital the largest and leading University of Cyprus which is located in northern part of Nicosia, the capital of North Cyprus. The services of Hospital of Near East University 209 private, single patient rooms, 8 operating theatres, 30-bed Intensive Care Unit, 17-bed Neonatal Intensive Care Unit, an advanced laboratory where a wide array of medical and experimental tests can be carried out, 22 other labs specializing on certain medical tests.

3.3 Sample Selection

The study was performed on the register nurses who work in the Near East University Hospital. A total of 168 nurses work in the Near East Hospital. Total 165 voluntary nurses were composed the sample of the study with 98% access rate.

3.4 Study Tools

A questionnaire that was developed by the researchers on the basis of the literature was used as data collection tool in this study (Aziz et al 2013; Talec et.al. 2016; Macintyre et.al. 2016; Cooray et.al.2015). The questionnaire contained 3 sections. The first section regarding for demographics characteristics of nurses and included 12 questions. The second section consisted 34 questions regarding knowledge of nurses on DVT risks and prevention with 3 choices (True, false, don't know). The last section consisted 13 questions regarding practices of nurses on DVT prevention with 3 choices (Always, sometimes, never).

Since all of the nurses in the hospital can speak Turkish, the questionnaire was prepared as Turkish. Two nursing specialists and one language specialist contributed and approved the questionnaire (Appendix 1& 2).

3.5 Pilot Study

A pilot study was performed on ten nurses after approval from the Near East Institutional Reviews Board (IRB) of Near East University Hospital. After the pilot study, revision was not necessary and the nurses who included in pilot study were added to main sample.

3.6 Data Collection

Data were collected using a questionnaire in July 2017. The questionnaires were administered by researchers on nurses while they are on the wards or clinics during duty shift with face to face, self-completion method. Completion of the questionnaire was taking almost 20 minutes.

3.7 Ethical Aspect

Ethical approval was obtained from the Near East Institutional Reviews Board (IRB) of Near East University Hospital (Appendix 3). In addition, informed consent from the nurses and organizational permission were obtained (Appendix 4).

3.8. Data Analysis

Statistical Package of Social Sciences (SPSS) software version 20.0 was used to analyze the collected data. The methods used to analyze the data include an analysis of descriptive statistic variables such as frequency and percentages for the categorical variables. “True” and “false” statements were used in evaluation of knowledge questions. Comparisons were made between only correct answers and educational degree, years of nursing experience, previous DVT education of the nurses. The Pearson Chi-Square test was done to determine the differences. When F statistic was significant, the chosen level of significance is $p < 0.05$.

4. RESULTS

In this chapter, results of the study conducted to determine knowledge and practices of the nurses on DVT prophylaxis were given.

Table 4.1 Descriptive Characteristics of the Nurses (N=165)

Descriptive Characteristics	**N**	**%**
Age (Mean: 27.7)		
< = 25	79	47.9
26 – 30	63	38.2
> =31	23	13.9
Educational Degree		
Health care vocational high school (HCVHS)	32	19.4
Bachelor	129	78.2
Master's degree	4	2.4
Gender		
Male	53	32.1
Female	112	67.9
Years of Nursing Experience		
<=5	94	57.0
6-10	60	36.4
>=11	11	6.6
Years of Hospital Experience		
<=5	109	66.1
6-10	48	29.1
>=11	8	4.8
Years of Unit Experience		
< = 5	95	57.6
6-10	56	33.9
> =11	14	8.5

Table 4.1 (Cont) Descriptive Characteristics	**N**	**%**
Currently Working Unit		
Emergency care	34	20.6
Intensive care unit (ICU)	28	17.0
Medical unit	27	16.4
Obstetrics/gynecologyunit	22	13.3
Oncology unit	11	6.7
Surgical unit	30	18.2
Rehabilitation unit	13	7.8

Descriptive characteristics of the nurses are shown in Table 4.1. A total of 165 questionnaires were administered for this survey and most frequent age group was < 25 years (47.9%).The mean ages of the participants were 27.7years. Majority of the participants were female (67.9%), while 32.1% of them were male. Majority of the nurses had bachelor degree (78.2%). Most of the nurses had experience less than five years as registered nurses (57.0%), in the hospital (66.1%) and in the unit (57.6). It was determined that majority of the participants work in emergency care (20.6%), surgical (18.2%), in intensive care (17%) and medical units (16.4%) (Table 4.1).

Table 4.2 Characteristics of the Nurses on DVT Education (N=165)

Characteristics on DVT Education	N	%
Previous DVT Education		
Yes	68	41.2
No	97	58.8
Educational Resource(N=68)*		
School	24	35.3
Courses	13	19.1
Web resources	12	17.7
Congress/conferences	12	17.7
In-service education	7	10.2
Opinions on quality of the DVT Education (N=68)*		
Excellent	18	26.5
Very good	27	39.7
Good	23	33.8
Fair/poor	0	0.0
Need for Education on DVT		
Yes	165	100
Protocol on Prevention of DVT		
No	165	100

***Percentages were calculated based on N=68**

Table 4.2 shows the distribution of characteristics of the nurses on DVT education. The majority of (58.8%) of the participants had not received DVT education. Nurses who received DVT education reported five category of resource. The school was higher percentage (35.3%). Other resources were courses (19.1%), web and congress/conferences (17.7%) and in-service education (10.2%) respectively. Regarding to quality of the DVT education, participants rated as very good (39.7%), good (33.8%) and excellent (26.5%).All of the nurses stated that they need for education on DVT and no guidelines and protocol on prevention of DVT during their work experience.

Table 4.3 Nurses' General Knowledge on DVT (N=165)

Statements on DVT	True/ False	Correct answer		Wrong answer / I don't know	
		N	%	N	%
DVT occur as a result of stasis of blood (venous stasis), vessel wall injury, and altered blood coagulation.	(T)*	120	72.2	45	27.3
Venous thromboembolism (VTE) is a fatal complication of DVT.	(T)*	145	87.9	20	12.1
VTE is a major cause of sudden death in hospitalized patients.	(T)*	112	67.9	53	32.1
Surgical patients are more prone than medical patients to DVT/VTE.	(T)*	122	73.9	43	26.1
DVT occurs most frequently in the veins of the lower extremities.	(T)*	136	82.4	29	17.6
Deep vein thrombosis also occurs frequently in the upper limbs.	(F)**	72	43.6	93	56.4

(T)*= True statement
(F)= False statement**

Table 4.3 shows nurses' general knowledge on DVT. It was found that; majority of the nurses had correct answers in most of the items (5 of 6 items). Frequency of the correct answers were "Venous thromboembolism (VTE) is a fatal complication of DVT" (87.9%) (T), "DVT occurs most frequently in the veins of the lower extremities"(T) (82.4%), "Surgical patients are more prone than medical patients to DVT/VTE" (T) (73.9 %), "DVT occur as a result of stasis of blood (venous stasis), vessel wall injury, and altered blood coagulation" (T) (72.2%) and "VTE is a major cause of sudden death in hospitalized patients" (T) (67.9%) respectively. However, 56.4% of the nurses had wrong or "I don't know" answers for "Deep vein thrombosis also occurs frequently in the upper limbs" (F) item.

Table 4.4 Nurses' Knowledge on Risk Factors of DVT (N=165)

Statements on DVT Risk Factors	True/ False	Correct answer		Wrong answer / I don't know	
		N	%	N	%
Prolonged immobilization predisposes to DVT in hospitalized patients.	(T)*	114	69.1	51	30.9
Indwelling intravenous devices such as central venous catheters may predisposes to DVT.	(T)*	81	49.1	84	50.9
Paralysis, paresis, or recent plaster cast on lower extremities may predispose to DVT .	(T)*	111	67.3	54	32.7
Obesity may predisposes to DVT.	(T)*	101	61.2	64	38.8
Low body mass index may predisposes to DVT.	(F)**	89	53.9	76	46.1
Advancing age may predisposes to DVT.	(T)*	95	57.6	70	42.4
Previous DVT/VTE history may predisposes to DVT.	(T)*	117	70.9	48	29.1
There is no relationship between cancer or cancer treatment and DVT/VTE.	(F)**	82	49.7	83	50.3
Major surgery may predisposes to DVT.	(T)*	59	35.8	106	64.2
Varicose veins may predispose to DVT.	(T)*	69	41.8	96	58.2
Exercises may predisposes to DVT.	(F)**	46	27.9	119	72.1
Trauma may predisposes to DVT.	(T)*	56	33.9	109	66.1
Smoking may predisposes to DVT.	(T)*	55	33.3	110	66.7
Alcohol may predisposes to DVT.	(F)**	45	27.3	120	72.7
Cardiac diseases may predispose to DVT.	(T)*	45	27.3	120	72.7
There is no relationship between respiratory diseases and DVT.	(F)**	48	29.1	117	70.9
Infections or inflammations may predispose to DVT.	(T)*	49	29.7	116	70.3
Pregnancy or post-partum may predispose to DVT.	(T)*	61	37.0	104	63.0
Oral contraceptives or hormone replacement therapy may predispose to DVT.	(T)*	64	38.8	101	61.2
There is no relationship between family history of DVT/VTE and DVT.	(F)**	128	77.6	37	22.4

(T)*= True statement
(F)= False statement**

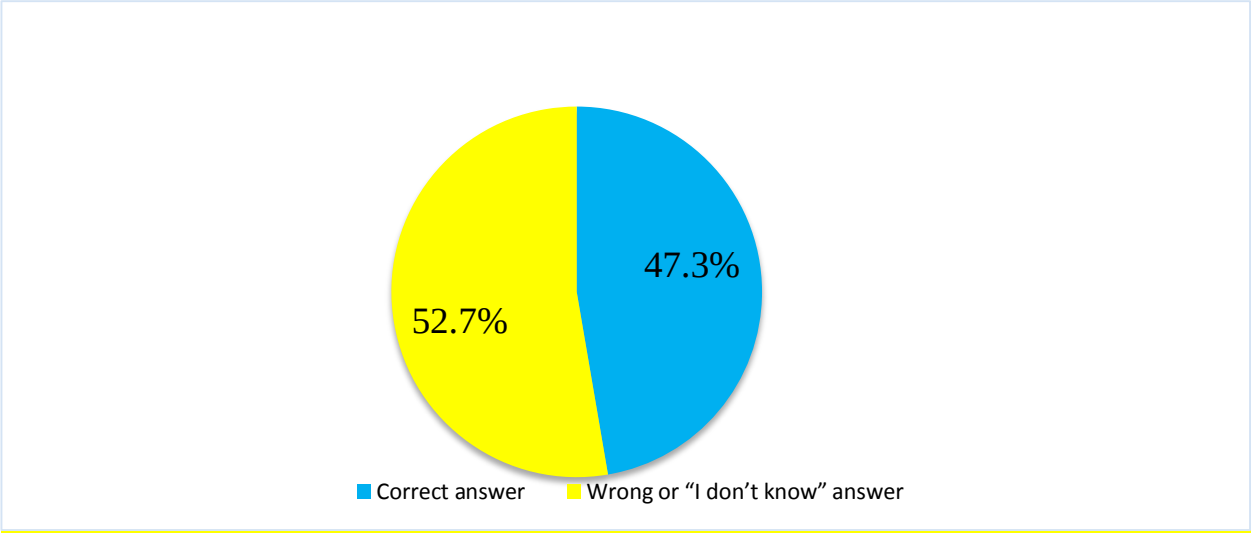

Figure 1. Nurses' Knowledge on Risk Factors of DVT

Nurses' knowledge on risk factors of DVT was shown in Figure 4.1 as general and in Table 4.4with details. The total frequency of correct answer is 47.3% and the total frequency of wrong or "I don't know" answer is 52.7% (Figure 1). It was determined that; majority of the nurses had wrong or "I don't know" answers in majority of the items (13 of 20 items) (Table 4.4).

The most frequently known items were "There is no relationship between family history of DVT/VTE and DVT" (F) (77.6%), "Previous DVT/VTE history may predisposes to DVT" (T) (70.9%),"Prolonged immobilization predisposes to DVT in hospitalized patients" (T)(69.1%), "Paralysis, paresis, or recent plaster cast on lower extremities may predispose to DVT" (T) (67.3%), "Obesity may predisposes to DVT" (T) (61.2%) and "Advancing age may predisposes to DVT" (T) (57.6%) respectively. However, "Alcohol may predisposes to DVT" (F)(72.7%), "Cardiac diseases may predispose to DVT" (T) (72.7%), "Exercises may predisposes to DVT" (F) (72.1%), "There is no relationship between respiratory diseases and DVT" (F) (70.9%), "Infections or inflammations may predispose to DVT" (T) (70.3%), "Smoking may predisposes to DVT" (T) (66.7%) and "Trauma may predisposes to DVT" (T) (66.1%) were frequent wrong or "I don't know" answers of the nurses respectively.

Table 4.5 Nurses' Knowledge on Prevention of DVT (N=165)

Statements on DVT Prevention	True/ False	Correct answer		Wrong answer / I don't know	
		N	%	N	%
Foot and leg exercises may prevent DVT.	(T)*	36	21.8	129	78.2
Elevating legs is necessary to prevent DVT/ VTE.	(T)*	48	29.1	117	70.9
Early ambulation after surgery may prevent DVT development.	(T)*	22	13.3	143	86.7
Bed rest is necessary after major surgery to prevent DVT.	(F)**	9	5.5	156	94.5
Heparin or low molecular weight heparin (LMWH) may prevent DVT development.	(T)*	82	49.7	83	50.3
Fluid restriction is necessary to prevent DVT.	(F)**	10	93.9	155	6.1
Elastic compression stockings may prevent DVT development.	(T)*	40	24.2	125	75.8
The use of intermittent pneumatic compression devices may prevent DVT development.	(T)*	30	18.2	135	81.8

(T)*= True statement
(F)= False statement**

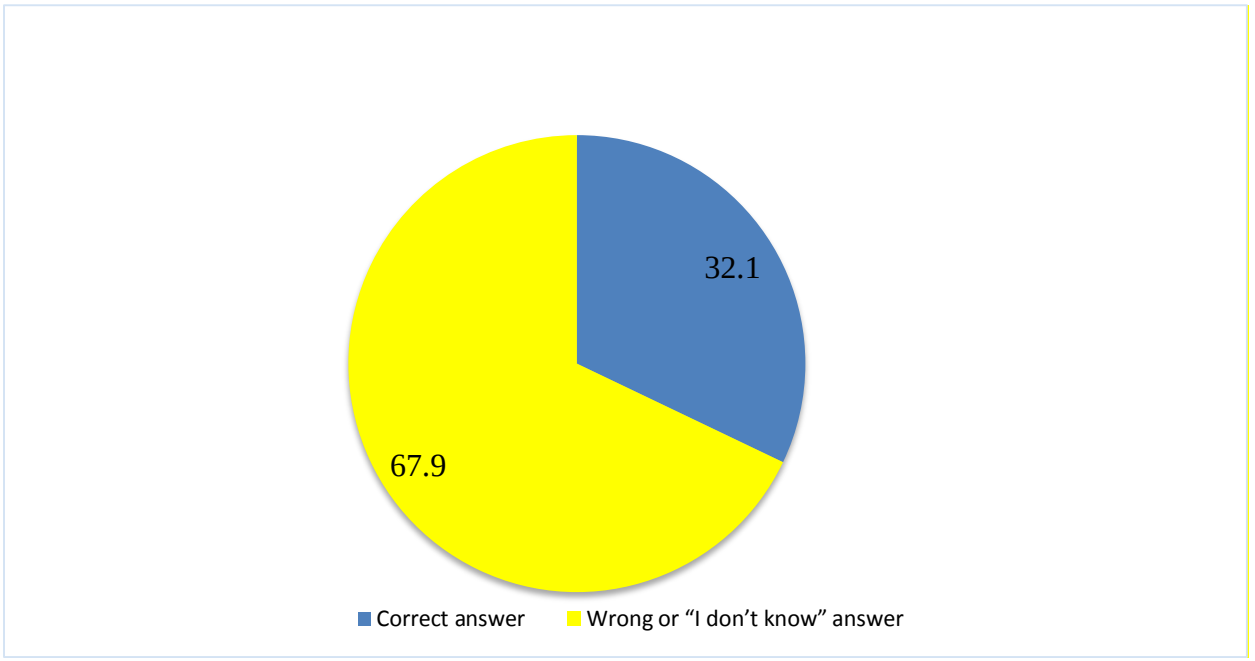

Figure 2. Nurses' Knowledge on Prevention of DVT

Nurses' knowledge on prevention of DVT was shown in Figure 4.2 as general and in Table 4.5 with details. The total frequency of correct answer is 32.1% and the total frequency of wrong or "I don't know" answer is 67.9% (Figure 1). It was determined that; majority of the nurses had wrong or "I don't know" answers in majority of the items (6 of 8 items) (Table 4.5).

It was determined that there was high percentage of correct answers in only one item. A majority of the nurses had correct answers for "Fluid restriction is necessary to prevent DVT" (F) (93.9%). However there were wrong or "I don't know" answers frequently for "Bed rest is necessary after major surgery to prevent DVT" (F) (94.5 %), "Early ambulation after surgery may prevent DVT development" (T) (86.7%), "The use of intermittent pneumatic compression devices may prevent DVT development" (T) (81.8%), "Foot and leg exercises may prevent DVT" (T) (78.2%), "Elastic compression stockings may prevent DVT development" (T) (75.8%),Elevating legs is necessary to prevent DVT/ VTE. (T)(70.9 %) items respectively.

Table 4.6 Practices of Nurses on DVT Prevention (N=165)

DVT PreventionPractices	Always		Sometimes		Never	
	N	%	N	%	N	%
Providing information to patients and/or relatives about risks and prevention of DVT.	14	8.5	44	26.7	107	64.8
Encouraging patients to do foot and leg exercises by themselves or relatives help if patients are unable to do so.	24	14.5	39	23.9	102	61.8
Encouraging early ambulation surgical of patients.	21	12.7	47	28.5	97	58.8
Assessing the DVT risks of patients the regularly.	25	15.2	55	33.3	85	51.5
Administering anticoagulants as preventive in clinic.	17	10.3	30	18.2	118	71.5
Monitoring the side effects of the anticoagulants.	20	12.1	27	16.4	118	71.5
Educating the patients on anticoagulants.	29	17.6	43	26.1	93	56.4
Educating the patients to avoid injury.	18	10.9	25	15.2	122	73.9
Encouraging patients to do elevate legs.	21	12.7	39	21.8	108	65.5
Educating the patients on sufficient fluid intake.	30	18.2	26	15.8	109	66.1
Using of the graduated compression stockings.	14	8.5	18	10.9	133	80.6
Teaching the patients about proper use of graduated compression stockings.	24	14.5	29	17.6	112	67.9
Assessing the patients regularly for signs and symptoms of DVT/VTE.	24	14.5	36	21.8	105	63.6

Frequencies of the reported practices of nurses on DVT prevention are shown in Table 4.6. It was determined that, majority of the nurses had “never” answers for all of the items on DVT prevention. Most frequent “never” answers were for the items of “Using of the graduated compression stockings” (80.6%), “Educating the patients to avoid injury” (73.9%), “Administering anticoagulants as preventive in clinic” (71.5%), “Monitoring the side effects of the anticoagulants” (71.5%), “Teaching the patients about proper use of graduated compression stockings”(67.9%) and “Educating the patients on sufficient fluid intake (66.1%), Encouraging patients to do elevate legs”(65.5%) respectively.

Table 4.7Comparison of Nurses' Educational Degree, Years of Nursing Experience, Previous DVT Education with General Knowledge on DVT

General Knowledge on DVT (Statements)	Educational Degree				P value	Years of Nursing Experience						P value	Previous DVT Education				P value
	Health care vocational high school		Bachelor			<=5		6-10		>=11			Yes		No		
	Correct answer					Correct answer							Correct answer				
	N	%	N	%		N	%	N	%	N	%		N	%	N	%	
DVT occur as a result of stasis of blood (venous stasis), vessel wall injury, and altered blood coagulation.	23	71.9	97	75.2	.700	67	71.3	46	82.1	7	63.6	.232	46	69.7	74	77.9	.240
Venous thromboembolism (VTE) is a fatal complication of DVT.	30	93.8	111	86.0	.237	80	85.1	51	91.1	10	90.9	.530	57	86.4	84	88.4	.697
VTE is a major cause of sudden death in hospitalized patients.	21	65.6	89	69.0	.714	65	69.1	36	64.3	9	81.8	.502	46	69.7	64	67.4	.755
Surgical patients are more prone than medical patients to DVT/VTE.	21	65.6	100	77.5	.163	74	78.7	39	69.6	8	72.7	.452	49	74.2	72	75.8	.823
DVT occurs most frequently in the veins of the lower extremities.	28	87.5	105	81.4	.415	80	85.1	44	78.6	9	81.8	.592	57	86.4	76	80.0	.295
Deep vein thrombosis also occurs frequently in the upper limbs.	20	62.5	69	53.3	.359	50	53.2	34	60.7	5	45.5	.531	39	59.1	50	52.6	.418

Comparison of nurses' educational degree,years of nursing experience,previous DVT education with general knowledge on DVT are shown in Table 4.7 It was determined that there were no statistically significant differences between items and descriptive characteristics (P>0.05).

Table 4.8 Comparison of Nurses' Educational Degree, Years of Nursing Experience, Previous DVT Education with Knowledge on Risk Factors of DVT

General Statements on DVT Risk Factors	Educational Degree				P value	Years of Nursing Experience						P value	Previous DVT Education				P value
	Health care vocational high school		Bachelor			<=5		6-10		>=11			Yes		No		
	Correct answer					Correct answer							Correct answer				
	N	%	N	%		N	%	N	%	N	%		N	%	N	%	
Exercises may predisposes to DVT.	23	71.9	92	71.3	.950	61	64.9	44	78.6	10	90.9	.067	49	74.2	66	69.5	.510
Trauma may predisposes to DVT.	14	43.8	41	31.8	.201	28	29.8	23	41.1	4	36.4	.366	23	34.8	32	33.7	.878
Smoking may predisposes to DVT.	10	31.2	43	33.3	.822	31	33.0	18	32.1	4	36.4	.963	25	37.9	28	29.5	.264
Alcohol may predisposes to DVT.	23	71.9	93	72.1	.980	67	71.3	42	75.0	7	63.6	.489	44	66.7	72	75.8	.205
Cardiac diseases may predispose to DVT.	9	28.1	34	26.4	.840	22	23.4	17	30.4	4	36.4	.720	15	22.7	28	29.5	.341
There is no relationship between respiratory diseases and DVT.	9	28.1	37	28.7	.950	24	25.5	18	32.1	4	36.4	.576	20	30.3	26	27.4	.685
Infections or inflammations may predispose to DVT.	14	43.8	34	26.4	.54	27	28.7	16	28.6	5	45.5	.501	18	27.3	30	31.6	.557
Pregnancy or post-partum may predispose to DVT.	8	25.0	51	39.5	.127	29	30.9	26	46.4	4	36.4	.160	25	37.9	34	35.8	.787
Oral contraceptives or hormone replacement therapy may predispose to DVT.	14	43.8	48	37.2	.496	38	40.4	19	33.9	5	45.5	.649	26	39.4	36	37.9	.848
There is no relationship between family history of DVT/VTE and DVT.	8	25.0	28	21.7	.689	26	27.7	9	16.1	1	9.1	.141	15	22.7	21	22.1	.926

Table 4.9Comparison of Nurses' Educational Degree, Years of Nursing Experience, Previous DVT Education with Knowledge on Risk Factors of DVT (Cont.)

General Statements on DVT Risk Factors	Educational Degree				P value	Years of Nursing Experience						P value	Previous DVT Education				P value
	Health care vocational high school		Bachelor			<=5		6-10		>=11			Yes		No		
	Correct answer					Correct answer							Correct answer				
	N	%	N	%		N	%	N	%	N	%		N	%	N	%	
Prolonged immobilization predisposes to DVT in hospitalized patients.	20	62.5	90	69.8	.429	57	60.6	45	80.4	8	72.7	.041	42	63.6	68	71.6	.287
Indwelling intravenous devices such as central venous catheters may predisposes to DVT.	19	59.4	59	45.7	.167	46	48.9	27	48.2	5	45.5	.975	31	47.0	47	49.5	.755
Paralysis, paresis, or recent plaster cast on lower extremities may predispose to DVT	15	46.9	94	72.9	**.005**	61	64.9	42	75.0	6	54.5	.276	45	68.2	64	67.4	.914
Obesity may predisposes to DVT.	18	56.2	81	62.8	.496	63	67.0	30	53.6	6	54.5	.232	44	66.7	55	57.9	.261
Low body mass index may predisposes to DVT.	15	46.9	59	45.7	.908	35	37.2	34	60.7	5	45.5	**.020**	34	51.5	40	42.1	.239
Advancing age may predisposes to DVT.	17	53.1	76	58.9	.553	50	53.2	39	69.6	4	36.4	**.047**	35	53.0	58	61.1	.311
Previous DVT/VTE history may predisposes to DVT.	21	65.6	93	72.1	.471	59	62.8	46	82.1	9	81.8	**.029**	46	69.7	68	71.6	.796
There is no relationship between cancer or cancer treatment and DVT/VTE	16	50.0	65	50.4	.969	47	50.0	31	55.4	3	27.3	.233	30	45.5	51	53.7	.304
Major surgery may predisposes to DVT.	10	31.2	47	36.4	.583	36	38.3	17	30.4	4	36.4	.615	27	40.9	30	31.6	.233
Varicose veins may predispose to DVT.	11	34.4	57	44.2	.315	35	37.2	26	46.4	7	63.6	.180	26	39.4	42	44.2	.543

Table 4.8 shows that there were statistically significant differences between correct answers of some items on risk factors of DVT and educational degree and years of nursing experience**.** Bachelor degree nurses' correct knowledge rates were higher (72.9%) than nurses graduated from the health care vocational high school (46.9%) in terms of "Paralysis, paresis, or recent plaster cast on lower extremities may predispose to DVT" item (P< 0.05). Nurses with 6-10 years of experience had higher correct knowledge rates than the other groups in terms of "Prolonged immobilization predisposes to DVT in hospitalized patients" (80.4%), "Low body mass index may predisposes to DVT" (60.7%), "Advancing age may predisposes to DVT" (69.6%), "Previous DVT/VTE history may predisposes to DVT" (82.1%) and these differences were found significant statistically (P<0.05). However, there wasn't statistically significant differences in terms of majority of the items on knowledge of DVT risk factors and educational degree and years of nursing experience (P>0.05).

Table 4.10 Comparison of Nurses' Educational Degree , Years of Nursing Experience, Previous DVT Education with Knowledge on DVT Prevention

General Statements on DVT Prevention	Educational Degree				P value	Years of Nursing Experience						P value	Previous DVT Education				P value
	Health care vocational high school		Bachelor			<=5		6-10		>=11			Yes		No		
	Correct answer					Correct answer							Correct answer				
	N	%	N	%		N	%	N	%	N	%		N	%	N	%	
Foot and leg exercises may prevent DVT	7	21.9	28	21.7	.983	18	19.1	15	26.8	2	18.2	.524	11	16.7	24	25.3	.193
Elevating legs is necessary to prevent DVT/ VTE.	15	46.9	32	24.8	.014	25	26.6	18	32.1	4	36.4	.665	21	31.8	26	27.4	.541
Early ambulation after surgery may prevent DVT development.	4	12.5	17	13.2	.919	12	12.8	8	14.3	1	9.1	.890	11	16.7	10	10.5	.255
Bed rest is necessary after major surgery to prevent DVT	2	6.2	7	5.4	.856	6	6.4	3	5.4	0	0.0	.681	4	6.1	5	5.3	.829
Heparin or low molecular weight heparin (LMWH) may prevent DVT development.	17	53.1	63	48.8	.664	42	44.7	33	58.9	5	45.5	.231	32	48.5	48	50.5	.799
Fluid restriction is necessary to prevent DVT.	3	9.4	7	5.4	.418	8	8.5	2	3.6	0	0.0	.324	3	4.5	7	7.4	.528
Elastic compression stockings may prevent DVT development.	7	21.9	33	25.6	.664	23	24.5	14	25.0	3	27.3	.979	15	22.7	25	26.3	.604
The use of intermittent pneumatic compression devices may prevent DVT development.	3	9.4	27	20.9	.133	19	20.2	9	16.1	2	18.2	.819	13	19.7	17	17.9	.773

Table 4.9 shows that bachelor degree nurses' correct knowledge rates were lower (24.8%) than nurses graduated from the health care vocational high school (46.9%) in terms of "Elevating legs is necessary to prevent DVT/ VTE" item and this difference was found significant statistically ($P< 0.05$). However, there wasn't statistically significant differences in terms of rest of the items on knowledge of DVT prevention and educational degree and years of nursing experience ($P>0.05$).

Table 4.11 Comparison of Nurses' Educational Degree , Years of Nursing Experience, Previous DVT Education with Practices on DVT Prevention

Practices on DVT Prevention	Educational Degree				P value	Years of Nursing Experience						P value	Previous DVT Education				P value
	Health care vocational high school		Bachelor			<=5		6-10		>=11			Yes		No		
	Always					Always							Always				
	N	%	N	%		N	%	N	%	N	%		N	%	N	%	
Providing information to patients and/or relatives about risks and prevention of DVT.	4	12.5	10	7.8	.457	8	8.5	5	8.9	1	9.1	.233	4	6.1	10	10.5	.547
Encouraging patients to do foot and leg exercises by themselves or relatives help if patients are unable to do so.	6	18.8	18	14.0	.738	14	14.9	9	16.1	1	9.1	.967	10	15.2	14	14.7	.848
Encouraging early ambulation surgical of patients.	2	6.2	19	14.7	.305	10	10.6	9	16.1	2	18.2	.469	9	13.6	12	12.6	.902
Assessing the DVT risks of patients the regularly.	4	12.5	20	15.5	.800	15	16.0	9	16.1	0	0.0	.522	6	9.1	18	18.9	.216
Administering anticoagulants as preventive in clinic.	2	6.2	14	10.9	.430	8	8.5	6	10.7	2	18.2	.184	5	7.6	11	11.6	.283
Monitoring the side effects of the anticoagulants.	3	9.4	16	12.4	.586	10	10.6	8	14.3	1	9.1	.875	3	4.5	16	16.8	.003
Educating the patients on anticoagulants.	9	28.1	20	15.5	.217	18	19.1	7	12.5	4	36.4	.106	12	18.2	17	17.9	.995
Educating the patients to avoid injury.	1	3.7	17	13.2	.039	13	13.8	3	5.4	2	18.2	.271	6	9.1	12	12.6	.227

Table 4.12 Comparison of Nurses' Educational Degree , Years of Nursing Experience, Previous DVT Education with Practices on DVT Prevention (Cont.)

DVT practice Prevention	Educational Degree				P value	Years of Nursing Experience						P value	Previous DVT Education				P value
	Health care vocational high school		Bachelor			<=5		6-10		>=11			Yes		No		
	Always					Always							Always				
	N	%	N	%		N	%	N	%	N	%		N	%	N	%	
Encouraging patients to do elevate legs.	3	9.4	18	14.0	.706	12	12.8	8	14.3	1	9.1	.809	10	15.2	11	11.6	.170
Educating the patients on sufficient fluid intake.	7	21.9	22	17.1	.513	12	12.8	13	23.2	4	36.4	.154	15	22.7	14	14.7	.209
Using of the graduated compression stockings.	6	18.8	8	6.2	.069	7	7.4	5	8.9	2	18.2	.334	4	6.1	10	10.5	.600
Teaching the patients about proper use of graduated compression stockings.	5	15.6	19	14.7	.981	16	17.0	7	12.5	1	9.1	.845	7	10.6	17	17.9	.145
Assessing the patients regularly for signs and symptoms of DVT/VTE.	3	9.4	20	15.5	.541	15	16.0	7	12.5	1	9.1	.605	7	10.6	16	16.8	.397

Results showed statistically insignificant differences in terms of majority of the items on practices of DVT prevention and educational degree and years of nursing experience (P>0.05) (Table 4.10). However, it was found that there were statistically significant differences between correct answers of some items on practices of DVT prevention and educational degree and years of nursing experience. Bachelor degree nurses' correct knowledge rates were higher (13.2%) than nurses graduated from the health care vocational high school (3.7%) in terms of "Educating the patients to avoid injury" item (P< 0.05). Nurses who have not previous DVT education had higher correct knowledge rates (16.8%) than the nurses who have previous education (4.5%) (P< 0.05).

5. DISCUSSION

The focus of present study was determination of the knowledge and practices of DVT prophylaxis among nurses. The study was conducted on 165 nurses with vary age, experience and level of education. Regarding age, the study revealed that most frequent age group was <25 years (47.9%) and mean ages of the participants were 27.7 years. Majority of the participants were female, and had bachelor degree. According to years of experiences, one third of them had an experience less than five years that lead to most of nurse's participants had fresh graduated and new employee. It was determined that majority of the participants were working in emergency care, surgical, in intensive care and medical units that prophylaxis of DVT is very important.

Education of the nurses on DVT prevention issues including risk factors, nursing interventions, prophylaxis and treatment is vital to improve their DVT knowledge and practice. Results of the present study showed that more than half of the participants had not received DVT education. Nurses who received DVT education reported the school as the resource with higher percentage. However, knowledge and practices of the nurses should be continuously improved via courses, in-service educations and scientific congress, workshops etc. Regarding to quality of the DVT education, participants rated as very good, good and excellent respectively. In the survey all of the participants reported that they need of education on DVT. This result is important in terms of indicating the awareness of knowledge deficit and willingness to attendance to educational programs on DVT.

DVT clinical guidelines that are a frontline for nurses to obtain clinical practice build up evidence base practice, also they are systematic designed to enhance decisions making regards care to provide nursing interventions outcomes. In another hand, they standardize care and emphasize reducing complications and provide a change during practice. However, in the current study, all of the nurses stated that they had no guideline and/or protocol on prevention of DVT during their work experience.

Regarding to nurses' general knowledge on DVT, it was found that; majority of the nurses had correct answers in most of the items (5 of 6 items) and this is a satisfying result. Nurses had correct answers for "Venous thromboembolism (VTE) is a fatal complication of DVT" (T), "DVT occurs most frequently in the veins of the lower extremities" (T), "Surgical patients are more prone than medical patients to DVT/VTE" (T), "DVT occur as a result of stasis of blood (venous stasis), vessel wall injury, and altered blood coagulation" (T) and "VTE is a major cause of sudden death in hospitalized patients" (T) respectively. There are studies in the relevant literature showing similarity with our results. In a study conduct by Serigne et al (2011), it was found that a majority of participants choose correct answer related to surgical patients more at risk than medical patients, which revealed similarity with our finding. Buesing et al (2015) stated the DVT and PE are estimated to be the number one preventable cause of death in hospitalized patients. In the present study, 56.4% of the nurses had wrong or "I don't know" answers for "Deep vein thrombosis also occurs frequently in the upper limbs" (F) item. Whereas, DVT also occurs frequently in the upper limbs. Annual incidence of DVT is approximately 1/1000, and the proportion of Deep Vein Thrombosis of the Upper Extremity is around 4 to 10%(Cote et al 2016; Encke et al 2016).

Detailed examination of knowledge of nurses on risk factors of DVT showed poor level knowledge with 47.3% of participants rated correct answer statement and majority of the nurses had wrong or "I don't know" answers in majority of the items (13 of 20 items). This finding similar with study conducted by Jung-Ah Lee et al (2014) evaluating hospital nurses' perceived knowledge and practices of venous thromboembolism assessment and prevention. They showed poor or fair of VTE risk assessment at overall knowledge and recommended to revisit in-service continuous education about VTE risk assessment especially in acute care settings.

In our study, the most frequently known DVT risks were "There is no relationship between family history of DVT/VTE and DVT" (F), "Previous DVT/VTE history may predisposes to DVT" (T), "Prolonged immobilization predisposes to DVT in hospitalized patients" (T), "Paralysis, paresis, or recent plaster cast on lower extremities may predispose to DVT" (T), "Obesity may predisposes to DVT" (T) and "Advancing age may predisposes to DVT" (T) respectively.

Above factors were described as DVT risk factors in relevant literature.For example immobilization has been described as a major risk factor for VTE, especially in elderly populations over 70 years of age (Engbers et al 2015). Nicolaides et al (2013) consider patients undergoing plastic surgery in moderate-risk and indicated that they should receive pharmacoprophylaxis 24 h after surgery or with mechanical prophylaxis. Cardiac & critically ill patients' blood coagulation is changed, inflammation, and the host immune response are intricately linked, rendering the development of venous thromboembolism (Levi et al 2010). Exercises can reduce of occurrence of VTE; whereas prolonged bed rest may be complicated by muscle wasting, skeletal demineralization, joints stiffness, metabolic disorders, and thromboembolism (Pashikanti et al 2012). However, "Alcohol may predisposes to DVT" (F), "Cardiac diseases may predispose to DVT" (T), "Exercises may predisposes to DVT" (F), "There is no relationship between respiratory diseases and DVT" (F), "Infections or inflammations may predispose to DVT" (T), "Smoking may predisposes to DVT" (T) and "Trauma may predisposes to DVT" (T) were frequent wrong or "I don't know" answers of the nurses respectively in the current study.

Regarding to nurses' knowledge on prevention of DVT, it was determined that 67.9% of them had a weak knowledge. In a quantitative research conducted by Abin et al (2016) among 100 stuff nurses working in critical care units, it was revealed that 42% of the nurses had poor knowledge on the prevention on DVT among hospitalized patients. DVT prevention includes mechanical and/or pharmacological measures. Mechanical prophylaxis methods include elastic compression stockings, intermittent pneumatic compression, and foot compression devices (Ravindra et al 2015).

The mechanisms of elastic compression stocking include improved venous return through external compression (Partsch 2012). Therefore the elastic compression stockings are performed to reduce or prevent recurrent venous thromboembolism. In a meta-analysis that was conducted by Sachdeva et al (2014) to evaluate the effectiveness of graduated compression stockings (GCSs) for prevention of DVT in various groups of hospitalized patients; the author concluded GCSs can reduce the risk of incidence of DVT in general and orthopedic surgery. In the present study, majority of nurses had wrong or "I don't know" answers about mechanical prophylaxis methods. Pharmacological prophylaxis of DVT includes use of heparin and low molecular weight heparin (LMWH). The anticoagulants were considered the first line in prophylaxis in the study conducted by Lilly et al (2014) that report patients receiving pharmacological prophylaxis had a lower risk of death. In our study, there were wrong or "I don't know" answers frequently for "Heparin or low molecular weight heparin (LMWH) may prevent DVT development" (T). Early mobilization, within 24h, is an essential component of enhanced recovery after surgery as well as a prognostic factor (Neville et al 2014). However a majority of our participants had wrong or "I don't know" answers. In addition, there were wrong or "I don't know" answers frequently for "Foot and leg exercises may prevent DVT" (T) and "Elevating legs is necessary to prevent DVT/ VTE (T) items. It was determined that there was high percentage of correct answers in only one item including "Fluid restriction is necessary to prevent DVT" (F). The findings of our study revealed unsatisfactory nursing knowledge regarding to preventing of DVT.

Nurses have major role in DVT/VTE prevention including patient education, administering anticoagulants and mechanical prophylaxis methods (Jung-Ah Lee et al 2014). McMahon (2011) encourage to enhance develop nurses' practice and to prepare them for their extending roles and hospital requirement. In the present study, reported practices of nurses on DVT prevention showed that, majority of the nurses had "never" answers for all of the items.

Most frequent "never" answers were for the items of "Using of the graduated compression stockings", "Educating the patients to avoid injury", "Administering anticoagulants as preventive in clinic", "Monitoring the side effects of the anticoagulants", "Teaching the patients about proper use of graduated compression stockings" and "Educating the patients on sufficient fluid intake" and "Encouraging patients to do elevate legs" respectively. This unsatisfying result may be due to absence of clinical practice guidelines of DVT. Similarly, Fangfei et al (2010) performed a study on thromboprophylaxis awareness among hospital staff that revealed 10% of nurses and pharmacists were not aware of current guidelines. Researchers recommend improving staff knowledge and attitude towards thromboprophylaxis by reinforcing educational programmers. Jed et al (2013) noticed no measurable improvements in VTE prevention practices of nurses. Conversely, Songwathana et al (2011) determined that a big majority of nurses have the greatest possibility of implementation regarding foot exercises. An integrative review study conducted by Jun et al (2016) indicated that there are external factors that were influencing using of clinical practice guidelines such as resources, leadership, and organizational culture, and concluded the improving the use of clinical practice guidelines that make the nurses must actively participate in development, implementation and high quality care for all patients.

In comparison of nurses' educational degree, years of nursing experience, and previous DVT education with knowledge on risk factors and DVT prevention, there wasn't statistically significant differences in terms of majority of the items ($P>0.05$). Results showed statistically significant differences only in a few items ($P< 0.05$).

Results of the current study showed that there were statistically significant differences in terms of educational levels and experiences of the nurses. Regarding to DVT risk factors, bachelor degree nurses' correct knowledge rates were higher than nurses graduated from the health care vocational high school in terms of "Paralysis, paresis, or recent plaster cast on lower extremities may predispose to DVT" item ($P< 0.05$).

In DVT prevention; bachelor degree nurses' correct knowledge rates were higher than nurses graduated from the health care vocational high school in terms of "Educating the patients to avoid injury" item (P< 0.05). So nurses should attend to educational course to prepare them and endorse with patients. In the same line study conducted in private hospital in Sydney, Australia, the author notice most nurses reported that the educational outreach visits supported them in implementing best practice VTE (Li et al 2010). Years of nursing experience was also determined as a significant factor affecting nurses' knowledge. Nurses with 6-10 years of experience had higher correct knowledge rates than the other groups in terms of "Prolonged immobilization predisposes to DVT in hospitalized patients", "Low body mass index may predisposes to DVT", "Advancing age may predisposes to DVT", "Previous DVT/VTE history may predisposes to DVT" and these differences were found significant statistically (P< 0.05).

6. CONCLUSION

Results of the present study showed high level knowledge of nurses only in general knowledge on DVT. Whereas nurses had inadequate knowledge on DVT risk factors and preventive measures, and poor practices of DVT prevention and this is unsatisfying finding. These results may be resulted from to absence of guidelines and poor of in-service training and lack of experience. This condition may inhibit for stuff improvement and development; also may prevent from motivations and increase incidences of VTE complications. Professional training program can affect for well outcome and reflect for inpatients services. It is necessary to give the chance of education to the nurses with higher opportunity to achieve and exposure to professional new in-service education related DVT. Continuous education including update theoretical knowledge about DVT preventions will be reflected to patients care. Sayed, et al (2011) documented that the nurses who had weak of knowledge and/or skills before attending to a training program had a significant improvement after the implementation of the program. They will have highest opportunities to understand strategy guidelines regard practices on DVT prevention because all of our participants mentioned that they need education about DVT.

7. FINDINGS AND RECOMMENDATIONS

7.1. Findings

Main findings of the study that was performed with the aim of determination of the knowledge and practices of DVT prophylaxis among nurses were listed as followings:

- The mean ages of the participants were 27.7 years. Majority of the participants were female (67.9%), while 32.1% of them were male. Majority of the nurses had bachelor degree (78.2%). Most of the nurses had experience less than five years as registered nurses (57.0%), in the hospital (66.1%) and in the unit (57.6) (Table 4.1).
- The majority of (58.8%) of the participants had not received DVT education. The school was higher percentage (35.3%) among the resources (Table 4.2).
- Regarding to general knowledge on DVT, it was found that; majority of the nurses had correct answers in most of the items (5 of 6 items) (Table 4.3).
- The total frequency of correct answers about knowledge on risk factors of DVT is 47.3% and the total frequency of wrong or "I don't know" answer is 52.7% (Figure 1). It was determined that; majority of the nurses had wrong or "I don't know" answers in majority of the items (13 of 20 items) (Table 4.4).
- The total frequency of correct answers about knowledge on prevention of DVT is 32.1% and the total frequency of wrong or "I don't know" answer is 67.9% (Figure 1). It was determined that; majority of the nurses had wrong or "I don't know" answers in majority of the items (6 of 8 items) (Table 4.5).
- Regarding to the reported practices of nurses on DVT prevention, it was determined that, majority of the nurses had "never" answers for all of the items on DVT prevention (Table 4.6).
- There were statistically significant differences in terms of educational levels and experiences of the nurses with different items at risk factor, prevention and practices on DVT. ($P< 0.05$)(Table 4.7, Table 4.8, Table 4.9, Table 4.10).

7.2. Recommendations

Based on the results of the study following recommendations were made;

- Implementation of comprehensive, systematic, and continuous educational programs in order to enhance the knowledge and practices of the nurses on DVT. Ongoing education should be focused on risks and prevention of DVT.
- Development of institutional protocols, establishment of guidance booklets to provide DVT information are required in order to improve nursing practices on DVT prevention. Establishment and active nursing evaluation assessment form and implementation of DVT prophylaxis strategy in health system with evidence-based practice would be useful for patient safety and best practice.
- Experimental studies are recommended with more expanded nursing groups that focusing nursing practices on DVT prevention.

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Appendix 1Hemşirelerin Derin Ven Trombozu (DVT) Riskleri ve Önlemlerine İlişkin Bilgi ve Uygulamaları

1. Hemsirelerin Özellikleri **No:**		
1. Yaş		
2. Cinsiyet	□ Erkek	□ Kadın
3. Eğitim	□ Lise □ Master	□ Lisans □ Doktora
4. Hemşire olarak çalışma deneyimi (Yıl olarak)		
5. Hastanedeki deneyimi (Yıl olarak)		
6. Birimde çalışma deneyimi (Yıl olarak)		
7. Halen çalışılan hastane birimi	□ Acil servis	□ Yoğun Bakım Unitesi
	□ Dahiliye	□ Kadın Hastalıkları Ve Doğum
	□ Onkoloji	□ Ameliyathane
	□ Rehabilitasyon	□ Diğer
8. Önceden DVT konusunda eğitim alma durumu	□ Evet	□ Hayır
9. (8. Soruya 'evet' yanıtı verilmişse) Eğitim alınan kaynak	□ Okul □ Kurslar □ İnternet	□ Hizmet içi eğitim □ Kongre/Konferans □ Diğer
10. (8. Soruya 'evet' yanıtı verilmişse) DVT eğitiminin kalitesine ilişkin görüşü	□ Mükemmel	□ Çok iyi
	□ İyi	□Orta
	□ Kötü	
11. DVT konusunda eğitime gereksinim duyma durumu	□ Evet	□ Hayır
12. Hastanenin DVT önleme protokolü bulunma durumu	□ Evet	□ Hayır

2. DVT, Risk Faktörleri ve Önlenmesi				
Soru No	**DVT Risk Faktörlerine İlişkin İfadeler**	**Doğru**	**Yanlış**	**Bilmiyorum**
1	DVT venöz staz, damar duvarı hasarı ve koagülasyondaki değişiklikler sonucu meydana gelir.			
2	Venöz thromboembolizm (VTE), DVT'nin ölümcül bir komplikasyonudur.			
3	VTE,hastanede yatan hastalarda ani ölümlerin önemli bir nedenidir.			
4	Cerrahi hastalar DVT/VTE gelişimine dâhiliye hastalarına göre daha yatkındır.			
5	DVT ençok alt eksremitlerde meydana gelir.			
6	DVT üst eksremitlerde sık sık meydana gelir			
7	Hastanede yatan hastalarda uzun süreli hareketsizlik DVT'ye yatkınlığı artırır.			
8	Santral venoz katater gibi intravenöz araçlar DVT ye yatkınlığıartırır.			
9	Paralizi, parezi ya da alteksremitlerdeki alçılar DVT ye yatkınlığı artırır.			
10	Obezite DVT'ye yatkınlığa artırır.			
11	Düşük beden kütle endeski DVT'ye yatkınlığı artırır.			
12	İleri yaş DVT'ye yatkınlığı artırır.			
13	Geçirilmiş DVT/VTE öyküsü DVT'ye yatkınlığı artırır.			
14	Kanser veya kanser tedavisinin DVT/VTE ile ilişkisi yoktur.			
15	Büyük ameliyatlar DVT'ye yatkınlığı artırır.			
16	Varisler DVT'ye yatkınlığı artırır.			
17	Egzersizler DVT'ye yatkınlığı artırır.			
18	Travma DVT'ye yatkınlığı artırır.			
19	Sigara DVT'ye yatkınlığı artırır.			
20	Alkol DVT'ye yatkınlığı artırır.			
21	Kalp hastalıkları DVT'ye yatkınlığı artırır.			
22	Göğüs hastalıklarıyla DVT arasında bir ilişki yoktur.			

23	Enfeksiyon veya enflamasyon DVT'ye yatkınlığı artırır.			
24	Gebelik ve gebelik sonrası dönemde DVT'ye yatkınlık artar.			
25	Oral kontraseptif veya hormon replasman tedavisi DVT'ye yatkınlığı artırır.			
26	Ailede DVT/VTE öyküsü ile DVT gelişimi arasında ilişki yoktur.			
27	Ayak ve bacak egzersizleri DVT yi önleyebilir.			
28	Ayakları yükseltmekDVT/VTE'yi önlemekiçin gereklidir.			
29	Ameliyat sonrası erken mobilizasyon DVT'nin gelişmesini engelleyebilir.			
30	Büyük ameliyatlardan sonra DVT'yi önlemek için yatak istirahatigereklidir.			
31	Heparin veya düşük moleküler ağırlıklı heparin tadavisi DVT nin gelişmesini önleyebilir.			
32	DVT'yi önlemek için sıvı kısıtlaması gereklidir.			
33	Varis çorabı DVT nin gelişmesini engelleyebilir.			
34	Havalı kompresyon cihazlarının kullanımı DVT' nin gelişmesini engelleyebilir.			

3. DVT 'nin Önlenmesine Yönelik Hemşirelik Uygulamaları			
Hemşirelik Uygulamaları	**Her zaman**	**Bazen**	**Hiç**
1. DVT'nin riskleri ve önlenmesi hakkında hasta ve hasta yakınlarına bilgi vermek.			
2. Hastaları ayak ve bacak egzersizleri için teşvik etmek; hastalar yapamıyorsa hasta yakınlarından yardım almak.			
3. Cerrahi hastalarını erken mobilizasyon için teşvik etmek.			
4. Hastaları DVT riskleri açısından düzenli olarak değerlendirmek.			
5. Klinikte önleyici antikoagülan tedavi uygulaması.			
6. Antikoagülan tedavisinin yan etkilerini izlemek.			
7. Hastalara antikoagülan tedavi hakkında bilgi vermek.			
8. Hastalara yaralanmayı önlemek için eğitim vermek.			
9. Hastaları bacaklarını yükseltmeleri için teşvik etmek			
10. Hastaları yeterli sıvı alımı konusunda eğitmek.			
11. Varis çorabı kullanmak.			
12. Varis çorabının doğru kullanımını hastalara öğretmek.			
13. DVT/VTE belirti ve bulguları açısından hastaları düzenli olarak değerlendirmek.			

Appendix 2Knowledge and Practices of Nurses on Deep Vein Thrombosis (DVT) Risks and Prophylaxis

1. Characteristics of Nurse Participants **Subject Number:**		
1.Age		
2.Gender	□ Male	□ Female
3.Education	□ High school □ Master degree	□ Bachelor's □ PhD
4.Working experience as registered nurse (As years)		
5.Working experience in the hospital (As years)		
6.Working experience in the unit (As years)		
7.Currently working unit of the hospital	□ ER/urgent care	□ ICU
	□ Medical	□ Obstetrics/gynecology
	□ Oncology	□ Surgical
	□ Rehabilitation	□ Other
8.Previous DVT education	□ Yes	□ No
9. (If you answered the item 8 as "yes") Educational resource	□ School □ Courses □ Web resources	□ In-service education □ Congress/conferences □ Other
10. (If you answered the item 8 as "yes") Perceived quality of the DVT education	□ Excellent	□ Very good
	□ Good	□ Fair
	□ Poor	
11.Need for education on DVT	□ Yes	□ No
12.Is there any protocol in hospital for prevention of DVT	□ Yes	□ No

2.Nurses Knowledge, Risks Factors and Prevention and Prophylaxis of DVT				
2.1 Nurses Knowledge of DVT				
Q No.	Statements about Nurses Knowledge of DVT	True answer	False answer	Don't know
1	DVT occur as a result of stasis of blood (venous stasis), vessel wall injury, and altered blood coagulation.			
2	Venous thromboembolism (VTE) is a fatal complication of DVT.			
3	DVT occurs most frequently in the veins of the lower extremities.			
4	There is no relationship between cancer or cancer treatment and DVT/VTE.			
5	There is no relationship between respiratory diseases and DVT.			
6	Deep vein thrombosis also occurs frequently in the upper limbs			
7	There is no relationship between family history of DVT/VTE and DVT.			
2.2 Prevention and Prophylaxis of DVT				
Q No.	Statements about Prevention and Prophylaxis of DVT	True answer	False answer	Don't know
1	Foot and leg exercises may prevent DVT			
2	Elevating legs is necessary to prevent DVT/ VTE.			
3	Early ambulation after surgery may prevent DVT development.			
4	Bed rest is necessary after major surgery to prevent DVT			
5	Heparin or low molecular weight heparin (LMWH) may prevent DVT development.			
6	Fluid restriction is necessary to prevent DVT.			
7	Elastic compression stockings may prevent DVT development.			
8	The use of intermittent pneumatic compression devices may prevent DVT development.			
2.3 Risks Factors of DVT				
Q No.	**Statements about Risks Factors of DVT**	**True answer**	**False answer**	**Don't know**
1	Prolonged immobilization predisposes to DVT in hospitalized patients.			
2	VTE is a major cause of sudden death in hospitalized patients.			
3	Surgical patients are more prone than medical patients to DVT/VTE.			
4	Indwelling intravenous devices such as central venous catheters may predisposes to DVT.			
5	Paralysis, paresis, or recent plaster cast on lower extremitiesmay predispose to DVT.			

6	Obesity may predisposes to DVT.			
7	Low body mass index may predisposes to DVT.			
8	Advancing age may predisposes to DVT.			
9	Previous DVT/VTE history may predisposes to DVT.			
10	Major surgery may predisposes to DVT.			
11	Varicose veins may predispose to DVT.			
12	Exercises may predisposes to DVT.			
13	Trauma may predisposes to DVT.			
14	Smoking may predisposes to DVT.			
15	Alcohol may predisposes to DVT.			
16	Cardiac diseases may predispose to DVT.			
17	Infections or inflammations may predispose to DVT.			
18	Pregnancy or post-partum may predispose to DVT.			
19	Oral contraceptives or hormone replacement therapy may predispose to DVT.			

3.Practices of Nurses on DVT Prevention			
Nursing practices on DVT prevention	**Always**	**Sometimes**	**Never**
1.Providing information to patients and/or relatives about risks and prevention of DVT.			
2.Encouraging patients to do foot and leg exercises by themselves or relatives help if patients are unable to do so.			
3. Encouraging early ambulation surgical of patients.			
4. Assessing the DVT risks of patients the regularly.			
5. Administering anticoagulants as preventive in clinic			
6. Monitoring the side effects of the anticoagulants.			
7. Educating the patients on anticoagulants.			
8.Educating the patients to avoid injury.			
9.Encouraging patients to do elevate legs.			
10.Educating the patients on sufficient fluid intake.			
11.Using of the graduated compression stockings.			
12.Teaching the patients about proper use of graduated compression stockings.			
13.Assessing the patients regularly for signs and symptoms of DVT/VTE			

Appendix3Ethical Approval Near East Institutional Reviews Board (IRB)

EK-512-2017

YAKIN DOĞU ÜNİVERSİTESİ
BİLİMSEL ARAŞTIRMALAR DEĞERLENDİRME ETİK KURULU

ARAŞTIRMA PROJESİ DEĞERLENDİRME RAPORU

Toplantı Tarihi : 25.05.2017
Toplantı No : 2017/47
Proje No : 413

Yakın Doğu Üniversitesi Sağlık Bilimler Fakültesi öğretim üyelerinden Prof. Dr. Nurhan Bayraktar'ın sorumlu araştırmacısı olduğu, YDU/2017/47-413 proje numaralı ve **"Knowledge and Practices of Nurses About Deep Vein Thrombosis (DVT) Risks and Prophylaxis"** başlıklı proje önerisi kurulumuzca değerlendirilmiş olup, etik olarak uygun bulunmuştur.

1. Prof. Dr. Rüştü Onur (BAŞKAN)
2. Prof. Dr. Nerin Bahçeciler Önder (ÜYE)
3. Prof. Dr. Tamer Yılmaz (ÜYE) KATILMADI
4. Prof. Dr. Şahan Saygı (ÜYE)
5. Prof. Dr. Şanda Çalı (ÜYE)
6. Prof. Dr. Nedim Çakır (ÜYE)
7. Prof. Dr. Kaan Erler (ÜYE)
8. Doç. Dr. Ümran Dal Yılmaz (ÜYE) KATILMADI
9. Doç. Dr. Eyüp Yaycı (ÜYE)
10. Doç. Dr. Nilüfer Galip Çelik (ÜYE)
11. Yrd. Doç.Dr. Emil Mammadov (ÜYE)

Appendix 4Informed Consent Form Participant

You are invited to participate in a research study conducted by **Prof. Dr. Nurhan Bayraktar and Khalid Al-Mugeed,** from the Near East University Faculty of Health Sciences, Nursing Department. This study was planned to determinate the knowledge and practices of DVT prophylaxis among nurses. You were selected as a possible participant in this study, because findings of the study may be useful in improving nurses' awareness and preventing this important public health problem. If you decide to participate, a questionnaire will be used as data collection tool in this study. The questionnaire contains questions regarding for demographics, knowledge and practices of nurses on DVT prevention with 3 choices (Always, sometimes, never). However, I cannot guarantee that you personally will receive any benefits from this research. Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Subject identities will be kept confidential by don't using the name, and using participant coding. Your participation is voluntary. Your decision whether or not to participate will not affect your relationship with Near East Hospital. If you decide to participate, you are free to withdraw your consent and discontinue participation at any time without penalty. If you have any questions about the study, please feel free to contact [05428857853-khaledjust@yahoo.com]. [0 533 839 8451 nurhan.bayraktar@neu.edu.tr]. If you have questions regarding your rights as a research subject, please contact the Near East Institutional Review Board. You will be offered a copy of this form to keep. Your signature indicates that you have read and understand the information provided above, that you willingly agree to participate, that you may withdraw your consent at any time and discontinue participation without penalty, that you will receive a copy of this form, and that you are not waiving any legal claims.

Participant
Name, Surname:
Address:
Phone:
Signature:
Witness
Name, Surname:
Address:
Phone:
Signature:
Interviewer:
Name, Surname:
Address:
Phone:
Signature: