KNOWLEDGE OF THE RISK FACTORS AND PREVENTION OF DEEP VEIN THROMBOEMBOLISM AMONG ADULTS ATTENDING FEDERAL MEDICAL CENTRE, ASABA, DELTA STATE

Okwudishu Marian Ngozi[1] and Ilo Ifeyinwa Clementine[2*]

[1]Federal Medical Centre, Asaba, Delta State.

[2]Department of Nursing Science, Nnamdi Azikiwe University, Nnewi Campus.

Corresponding Email: ci.ilo@unizik.edu.ng

ABSTRACT: *Deep vein thrombosis (DVT) is a significant public health issue affecting thousands of patients globally and is accountable for a high number of hospitalizations annually. This study assessed the knowledge of the risk factors and prevention of deep vein thromboembolism among adults attending Federal Medical Centre, Asaba, Delta State. Three research questions and two hypotheses guided the study. A sample size of 420 respondents was involved in this descriptive cross-sectional study. Data were collected using structured questionnaire. Research questions were answered using frequencies and percentages. Hypotheses were tested using X^2 test. Results showed that only 31.9% of participants had previous knowledge of DVT. Obesity/overweight (72.4%), long travel for more than 6 hours whether by car or plane (66.6%), and excess duration of sitting (55.7%) were the most well-known risk factors. Only about 37 (8.8%) of the respondents knew that DVT occurs when the patient relaxes most of the time in bed, and the most known symptoms were: pain and discomfort 272 (64.7%), local pain in the leg 244 (58.1%), or redness of the affected skin 213 (50.7%). The overall knowledge level of the risk factors of DVT among the respondents showed that only 2% had good knowledge, 30% had fair knowledge and 68% had no knowledge. Most of the respondents 217 (51.6%) knew that DVT is dangerous and may lead to death. The level of knowledge of the risk factors of DVT is highest among the younger aged, individuals who were employed and those who had higher level of education. Poor knowledge necessitates community education programmes about risk factors, signs and symptoms, and squeal of deep vein thromboembolism.*

KEYWORDS: Deep Vein Thromboembolism, Risk Factors, Hospitalizations.

INTRODUCTION

Deep vein thromboembolism refers to the formation of one or more blood clots (a blood clot is also known as a 'thrombus,' while multiple clots are called 'thrombi') in the veins of the lower leg or calf, and can extend to involve the large deep veins of the upper legs or thigh (Gibbs, Fletcher & Blombery, 2019). A blood clot in the legs can also develop when there is no movement for a long time, e.g., movement might be limited when traveling a long distance or when on bed rest due to surgery, an illness or an accident. The clot(s) can cause partial or complete blocking of circulation in the vein, which may lead to pain, swelling, tenderness, discoloration, or redness of the affected area, and skin that is warm to the touch (Ho, 2020). According to Agnelli and Becattini (2019), individuals experiencing their first deep vein thromboembolism remain at increased risk of subsequent episodes throughout the remainder of their lives.

Deep vein thromboembolism is a significant public health issue affecting thousands of patients globally and is accountable for a high number of hospitalizations annually (Riback & Wessels, 2019) and, at the same time, it can be easily avoided. Hospital-associated deep vein thromboembolism is a significant health problem and one of the leading causes of preventable deaths globally (Maynard, 2018; Riback & Wessels, 2019). Its development can occur during or after a hospital stay and it is a significant cause of morbidity and mortality during the perioperative period, post cardiovascular events such as myocardial infarction and stroke in patients who are at high risk (Elisha, Heiner, Nagelhout & Gabot, 2018).

Deep vein thromboembolism mainly affects the lower extremities; however, it can also affect the upper extremities. Demobilization from the legs' deep veins is the most common cause of thrombus in the pulmonary arteries and this happens in one-third of deep vein thromboembolism cases. Those in hospitals are more likely to develop deep vein thromboembolism than patients in the community (Badireddy & Mudipalli, 2022). According to Yohannes, Abebe, Endalkachew and Endesha (2022), deep vein thrombosis has become a serious public health concern affecting up to 35 percent of surgical inpatients in Western countries, 12 percent in Malaysia, 9.6 percent in Sudan, and 2.9 percent in Nigeria. The difference in incidence has been attributed to differences in genes, diet, fibrinolytic activity and climate (Kahn, 2019). This may have contributed to the less attention given to this problem in our environment. Deep vein thromboembolism is a common complication in adult patients with approximately 14 percent in gynecological surgery, 22 percent in neurosurgery, 26 percent in abdominal surgery, and 45 percent to 60 percent in patients who do not get thromboprophylaxis for hip and knee procedures (Kiflie, Mersha, Workie, Admass, Ferede & Bizuneh, 2022). As a result of this, adequate knowledge and prevention of the risk factors of deep vein thromboembolism is required in order to lower the occurrence and recurrence of deep vein thromboembolism in adult patients.

The risk factors for deep vein thromboembolism are multifactorial and can be classified as modifiable or non-modifiable. Modifiable risk factors include immobility, HIV infection, sepsis, malignancy, heart failure, renal failure, diabetes mellitus, obesity, long travel, trauma and surgery. Non modifiable risks include gender, age, race and hereditary risk factors. Thromboembolic events are major causes of morbidity and mortality in cancer patients and have been noted to be common among individuals taking the combined oral contraceptives (COCs). Other risk factors include: bed rest (>3 days) and extended immobility (air travel >8 hours). Several risk factors, both inherited and acquired, have been examined and linked to

venous thrombotic events, and their discovery can help improve diagnostic methods and, more critically, thrombotic event prevention. Deep vein thromboembolism does not have a gender preference, but men seem to be more likely to have recurring incidences and the risk rises as people get older, partly due to an increase in the prevalence of medical disorders and other risk factors in the aged population (Faria, Antunes, H., Pontes, Antunes, A., Martins & Carvalho 2019). Both smoking and obesity have been linked to an increased risk of deep vein thromboembolism.

Despite the development of many preventive regimes, deep vein thromboembolism prevention remains a concern owing to a lack of vital knowledge on the precise nature of the 'trigger mechanism' that initiates thrombosis in the leg, as well as the lack of a sensitive and accurate approach for monitoring the effects of prophylaxis with accuracy. However, to maximize the prevention of venous thrombosis in high-risk individuals and adult patients, a thorough understanding of the risk factors is required. The risk of deep vein thrombosis is the combination of both genetic and acquired risk factors. In order to reduce the occurrence of venous thromboembolism, persons at risk must first be identified and educated and the risk exposure either avoided or modified. If the risk exposure cannot be modified, then appropriate primary preventive measures must be provided to reduce the risk of venous thromboembolism.

Many reports (McLendon, Goyal & Attia, 2022; Labiche 2019) have shown evidence of increasing prevalence of the risk factors of deep vein thromboembolism and growing concern in the adult population. McLendon *et al.* (2022) therefore suggested awareness on the risk factors for deep vein thromboembolism in older adults as a routine on admission to the hospital during medical history taking and physical assessment and more frequently if any risk factors are present. This will go a long way in detecting any other abnormalities and other co-morbid conditions that could lead to deep vein thromboembolism. Increased awareness on the risk factors of deep vein thromboembolism for the adults and high risk individuals should be an integral component of the prevention programme (Simmons *et al.*, 2018). This will go a long way to determine and identify early those who are likely to benefit from prophylaxis. Therefore, determining the level of knowledge about these risk factors is of great importance for earlier or more intensive treatments to prevent the negative health outcomes associated with deep vein thromboembolism. In view of the above, the researcher reasoned that there is a need to assess the knowledge of the risk factors for deep vein thromboembolism in adults on admission to the hospital.

Patients' awareness of the risk factors of deep vein thromboembolism is essential for their safety. Unfortunately, there seems to be lack of information on this disease and the symptoms can be attributed to other disorders leading to delay in diagnosis. There is a need to assess the knowledge of the adults on the risk factors of deep vein thromboembolism and to raise public awareness on the consequences. Increased patient awareness may promote self-assessment and timely report by individuals, especially those with high risk of its development. The findings from this study may help to mitigate the increase in the mortality rate of adult patients. It may increase awareness on the demographic, prevalence, prevention, risk factors and clinical characteristics of deep vein thromboembolism in adult patients. Due to the difficult detection of suspected cases of deep vein thromboembolism who may be overlooked and the high economic burden and the serious complications associated with its development, focusing on primary prevention of deep vein thromboembolism is essential. This study was conducted to determine the knowledge of the risk factors and prevention of deep vein

thromboembolism among adults attending Federal Medical Centre Asaba, Delta State. The findings of this study may increase the awareness of relevant stakeholders such as the hospital management and policy makers, health workers, patients and caregivers on the magnitude of this health problem and its implications. This study will hopefully guide on the adequate provision of proper equipment and materials and proper implementation and wider coverage of health education concerning the risk factors and prevention of deep vein thromboembolism. This study may also serve as a point of reference for further research work in this and similar areas.

Research Objectives

1. Determine the knowledge of the risk factors of deep vein thromboembolism among adults attending Federal Medical Centre, Asaba, Delta State.

2. Determine the knowledge of prevention of the risk factors of deep vein thromboembolism among adults attending Federal Medical Centre, Asaba, Delta State.

Research Questions

1. What do adult patients attending Federal Medical Centre, Asaba, Delta State know about the risk factors of deep vein thromboembolism?

2. What is the knowledge of prevention of the risk factors of deep vein thromboembolism among adults attending Federal Medical Centre, Asaba, Delta State?

Research Hypothesis

There is no significant difference in the level of knowledge of the risk factors of deep vein thromboembolism among adults attending Federal Medical Centre, Asaba based on gender.

MATERIALS AND METHODS

A cross-sectional descriptive research design was used to conduct this study. This study was carried out among adults attending Federal Medical Centre, Asaba, Delta State, South-South Nigeria. The simple random sampling technique was used to select a sample size of 420 which was determined using the 'Taro Yamane' formula for finite population. Data were collected by a structured self-administered questionnaire. The questionnaire contained questions on socio-demographic data, knowledge of the DVT, risk factors, symptom, complication and relation to patient's activity and possible strategies for prevention of deep venous thromboembolism. The face and content validity of the researcher designed questionnaire was established by experts in the Medical-Surgical Nursing. Split-half reliability method was used to determine the reliability of the instrument which yielded a coefficient reliability test result of 0.89. Informed consent was obtained from the respondents and confidentiality was maintained. Institutional Ethical Clearance was sought for and obtained from the research and ethical committee of the Federal Medical Centre, Asaba, Delta State. The data collection lasted from January to March 2023 at the end of which a total of 420 adults were interviewed. The data were analyzed Statistical Package for Social

Science (SPSS version 21) for Microsoft Windows. Data were presented and described using frequency tables, bar chart, pie chart and simple percentage distribution. The null hypothesis was tested at 0.05 alpha level using Chi square statistical techniques.

RESULTS

Table 1: Socio-demographic characteristics of the study population   n=420

Items	Responses	Frequency	Percentage
Gender	**Males**	**163**	**38.8**
	Females	**257**	**61.2**
Age	**Young adults (20–39)**	**132**	**31.4**
	Middle aged (40–64)	**194**	**38.8**
	Elderly (≥65)	**94**	**22.4**
Educational Status	**No Formal Education**	**74**	**17.6**
	Primary	**98**	**23.3**
	Secondary	**118**	**28.1**
	Tertiary	**130**	**30.9**
Occupation	**Student**	**15**	**17.6**
	Unemployed	**274**	**45.2**
	Self Employed	**86**	**37.1**
	Employed	**45**	**10.7**
Marital Status	**Single**	**50**	**11.9**
	Married	**293**	**69.7**
	Divorced	**37**	**8.8**
	Widowed	**40**	**9.5**
Do you have chronic illness?	**Yes**	**146**	**34.7**
	No	**274**	**65.2**
Unit Admitted	**Medical**	**244**	**58.1**
	Surgical	**176**	**41.9**
	Total	**420**	**100**

Data in Table 1 indicated that majority of the study population were young adults (20–39 years) (46.2%) followed by the middle-aged adults (40–64 years) (31.4%). Respondents aged 65 years and above (the elderly) had the least frequency (22.4%). Majority of the respondents were females (61.2%) while (38.8%) were males. Most of the respondents (30.9%) had tertiary education, followed by respondents with secondary education (28.1%) while those with primary education were 23.3%. The least respondents were those with no formal education (17.6%). Regarding the occupation of the respondents, those that were employed had the highest frequency (45.2%), followed by those that were self-employed (37.1%) while those that were unemployed were the least (17.6%). Of all the respondents, 274 (65.2%) did not have any chronic diseases while 146 (34.7%) had one chronic disease. Most of the

respondents (244; 58.1%) were admitted in the medical unit while 176 (41.9%) were admitted in the surgical unit
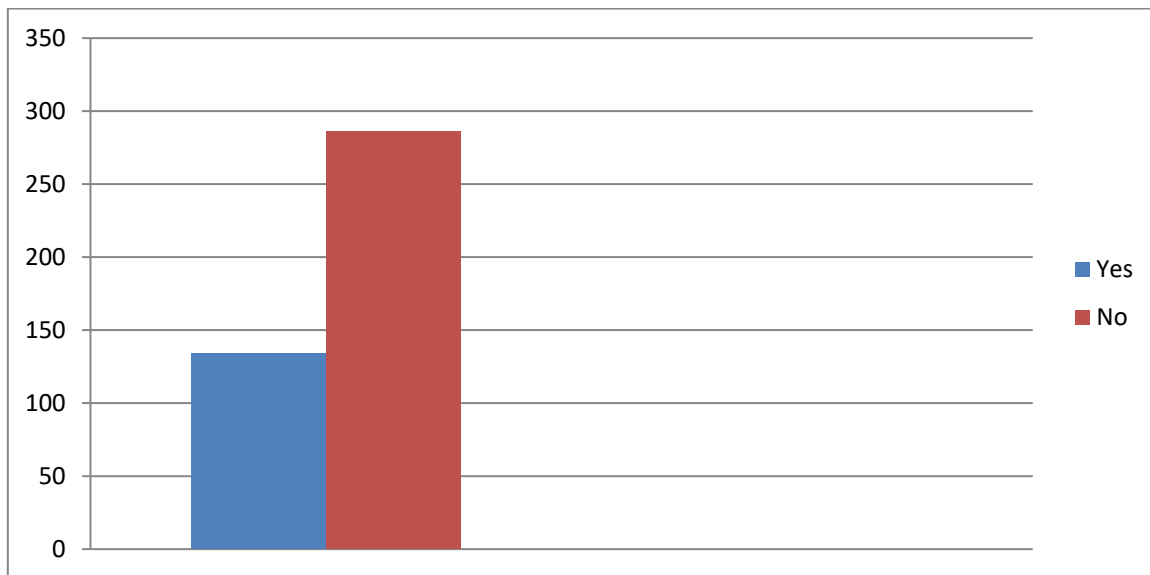

Figure 1: Knowledge of deep vein thromboembolism

Figure 1 shows that 134 (31.9%) of the participants had previous knowledge about deep vein thromboembolism while 286 (68.1%) had no knowledge.
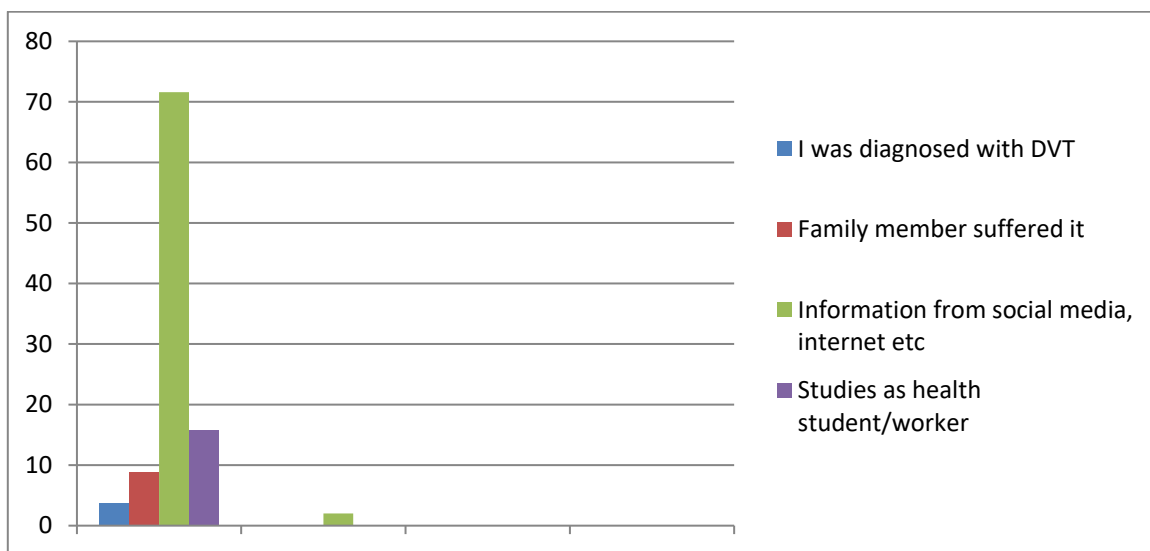

Figure 2: Source of knowledge of deep vein thromboembolism

Figure 2 shows that 134 (31.9%) of the participants had previous knowledge about deep vein thromboembolism. Most of them (96; 71.6%) got this knowledge from sources like social media, the internet and scientific books, while 21(15.7%) got the knowledge from studies.
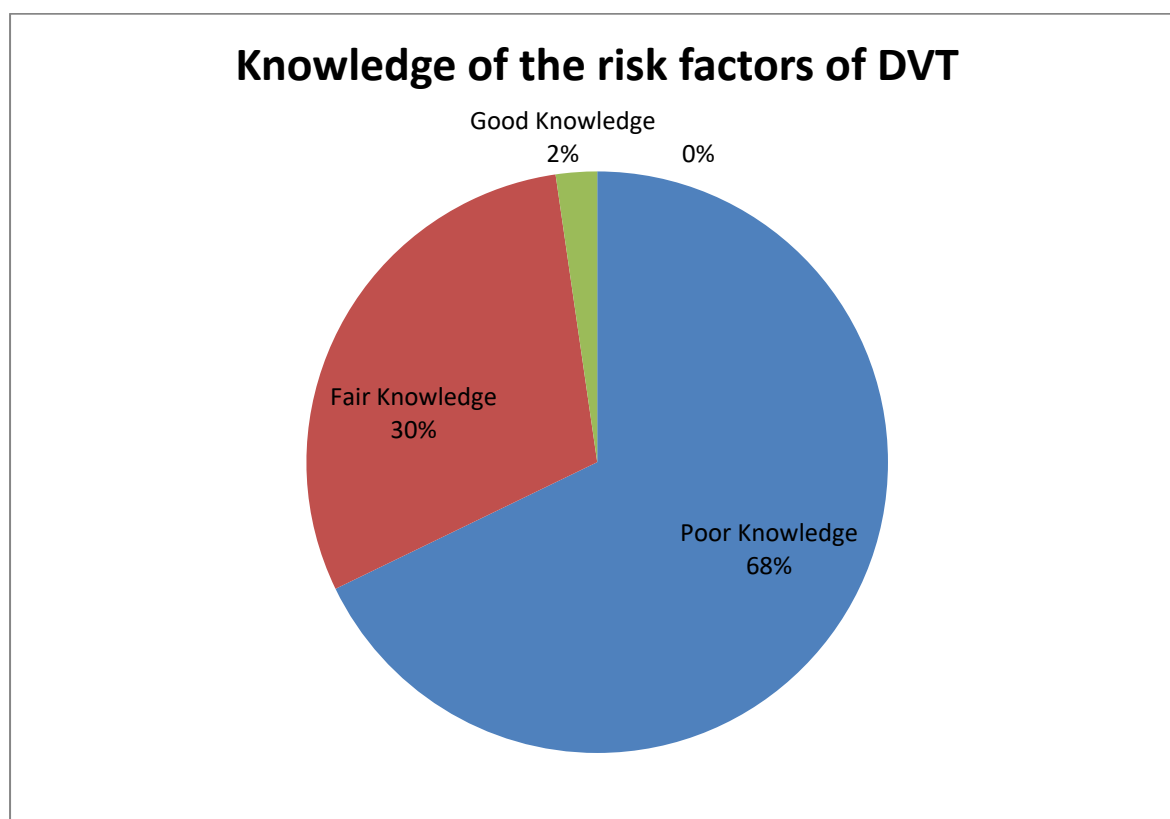
Figure 3: Percentage distribution to the participants according to their knowledge level regarding deep vein thromboembolism

The data in Figure 3 illustrates that few respondents (2%) had an excellent knowledge about deep vein thromboembolism, 30% had fair knowledge and 68% had poor knowledge.

Table 2: Distribution of the respondents according to responses to knowledge items regarding deep vein thromboembolism **(n = 420)**

Variable	Frequency	Percentages
Deep vein thromboembolism often occurs in		
Deep vein in the lowest extremities	**113**	**26.9**
Femoral vein	**45**	**10.7**
Popliteal vein (behind the knee)	**79**	**18.8**
Muscle vein	**31**	**7.4**
I don't know	**152**	**36.2**
In your own opinion which of the following causes deep vein thromboembolism (multiple answers)		
Smoking	**83**	**19.8**
Pregnancy/post partum period	**98**	**23.3**

A member of the family was previously injured	**144**	**34.3**
Birth control pills	**104**	**24.7**
Inflammatory bowel disease	**50**	**11.9**
Cancers	**32**	**7.6**
Overweight/Obesity	**304**	**72.4**
Chronic diseases (Diabetes Mellitus, Hypertension, Chronic heart disease, High Cholesterol)	**327**	**77.8**
Hereditary blood clothing disease	**135**	**32.1**
Excess sitting for long period	**234**	**55.7**
Long term travel (6 hours whether by car or plane	**280**	**66.6**
Performing previous surgery/ hospitalization for more than 2 days	**127**	**30.2**
I don't know	**64**	**15.2**
Mean number of known risks (Mean ±SD)	**4.37±3.58**	
Deep vein thromboembolism occurs according to the degree of patient activity if:		
The patient is very active	**32**	**7.6**
The patient uses a walking aid himself	**54**	**12.8**
The patient needs help from others	**40**	**9.5**
The patient relaxes most of the time in bed	**37**	**8.8**
I don't know	**257**	**61.2**
The most important symptoms of deep vein thromboembolism include: (multiple answer)		
Local pain in the leg	**244**	**58.1**
Pain and discomfort	**272**	**64.7**
Oedema (swelling of the lower limb)	**128**	**30.4**
Redness of the affected skin	**213**	**50.7**
High body temperature	**92**	**21.9**
I don't know	**333**	**79.3**
Mean number of known symptoms (Mean ±SD)	**1.29±1.8**	
DVT is dangerous and can lead to death		
Yes	**217**	**51.6**
No	**133**	**31.6**
I don't know	**70**	**16.6**

Table 2 shows that only 113 (29.6%) of the respondents knew that deep vein thromboembolism often occurs in deep veins in the lower extremities. The respondents identified the most known risk factors of DVT as chronic diseases (327; 77.8%) followed by obesity/overweight 304 (72.4%), long travel for more than 6hours whether by car or plane 280 (66.6%) and excess duration of sitting 234 (55.7%). Only about 37 (8.8%) of the respondents knew that DVT occurs when the patient relaxes most of the time in bed, and the most known symptoms of DVT were pain and discomfort (272; 64.7%), local pain in the leg (244; 58.1%), or redness of the affected skin (213; 50.7%) with the overall mean and standard deviation as 1.29±1.8. Most of the respondents (217; 51.6%) knew that DVT is dangerous and may lead to death. The overall knowledge level of the risk factors of DVT among the

respondents showed that only 2% had good knowledge, 30% had fair knowledge and 68% had no knowledge.

Research Question 2

What is the knowledge of prevention of deep vein thromboembolism among adults attending Federal Medical Centre, Asaba, Delta State?

Table 3: The level of knowledge of the prevention of DVT **n=420**

Items	Frequency Yes %	Frequency No %	Total
Walking or stretching of the legs may prevent DVT	**349(83.1)**	**71(16.9)**	**420(100)**
Elevating the legs is necessary to prevent DVT	**253(60.2)**	**167(39.7)**	**420(100)**
Washing or bathing regularly may prevent DVT	**314(74.7)**	**106(25.2)**	**420(100)**
Early ambulation after surgery may prevent DVT development	**342(81.4)**	**171(40.7)**	**420(100)**
Bed rest is necessary after major surgery to prevent DVT	**183(43.5)**	**237(56.4)**	**420(100)**
Use of drugs like heparin may prevent DVT development	**249(59.2)**	**78(18.5)**	**420(100)**
Maintaining adequate body weight may prevent DVT	**239(56.9)**	**181(43.1)**	**420(100)**
Foot and leg exercises may prevent DVT	**240(57.1)**	**180(42.8)**	**420(100)**
Drinking a lot of fluids may prevent DVT	**190(45.2)**	**230(54.7)**	**420(100)**
Eating lots of fiber may prevent DVT	**270(64)**	**150(35.7)**	**420(100)**
Total			

Table 3 shows that majority of the respondents (349; 83.1%) correctly identified the benefits of walking or stretching the legs for the prevention of deep vein thromboembolism. However, other prevention strategies correctly identified were early ambulation after a major surgery (342; 81.4%), elevation of the legs (253; 60.2%) and use of drugs like heparin (249; 59.2%). However, a relatively high percentage of activities like washing or bathing regularly (314; 74.7%), eating lots of fiber (270; 64%), and drinking a lot of fluids (190; 45.2%) were incorrectly identified as measures that may prevent deep vein thromboembolism.

Research Hypothesis

There is no significant difference in the level of knowledge of the risk factors of deep vein thromboembolism among adults attending Federal Medical Centre, Asaba based on gender.

Table 4: The level of knowledge of the risk factors of DVT based on gender n=420

Gender	Good Knowledge n (%)	Fair Knowledge n (%)	No Knowledge n (%)	Total n (%)	X^2	df	P- value
Males	2 (0.4)	54(12.8)	102 (24.2)	163 (38.8)			
Females	6 (1.4)	72(17.1)	179 (42.6)	257 (61.2)	1.62	1	0.20
Total	8 (1.9)	126(30)	286 (68)	420 (100)			

Table 4 shows the level of knowledge of the risk factors of DVT based on the gender of the respondents. The female respondents indicated the higher population with good knowledge (6; 1.4%) and fair knowledge (72; 17.1%) compared to the males who had (2; 0.4%) in the good knowledge and (54; 12.8%) in the fair knowledge category. Both the males and females had higher frequencies in the respondents that had no knowledge about the risk factors of deep vein thromboembolism. Chi-square test further indicated lack of significant association (p = 0.20) between gender and the level of knowledge of the risk factors of DVT among the respondents. The null hypothesis which states that there is no significant difference in the level of knowledge of the risk factors of DVT based on gender was accepted.

DISCUSSION

Socio-demographic Data of the Respondents

The findings of the study indicated that majority of the study population were young adults (20–39 years), more than half were females (61.2%), while 38.8% were males. Most of the respondents (30.9%) had tertiary education and many of them (45.2%) were students. More than half of the respondents (65.2%) did not have any chronic diseases, 244 (58.1%) were admitted in the medical unit while 176 (41.9%) were admitted in the surgical unit.

Knowledge Level of the Respondents about the Risk Factors of Deep Vein Thromboembolism

The findings of this study showed that less than half (134; 31.9%) of the respondents had previous knowledge about deep vein thromboembolism. Some of them got this knowledge from sources like social media, the internet, scientific books while 21 (15.7%) got the knowledge from studies. Few respondents had an excellent knowledge about deep vein thromboembolism, some had fair knowledge while a greater percentage (68%) had poor knowledge. Only 113 (29.6%) of the respondents knew that deep vein thromboembolism often occurs in deep veins in the lower extremities. The respondents identified the most known risk factors of DVT as chronic diseases (327; 77.8%), followed by obesity/overweight (304; 72.4%), long travel for more than 6 hours whether by car or plane (280; 66.6%) and excess duration of sitting (234; 55.7%). Only about 37 (8.8%) of the respondents knew that DVT occurs when the patient relaxes most of the time in bed, and the most known symptoms of DVT were pain and discomfort (272; 64.7%), local pain in the leg (244; 58.1%), or redness of the affected skin (213; 50.7%) with the overall mean and standard deviation as 1.29±1.8. Most of the respondents (217; 51.6%) knew that DVT is dangerous and may lead to death.

The overall knowledge level of the risk factors of DVT among the respondents showed that only 2% had good knowledge, 30% had fair knowledge and 68% had no knowledge.

The finding of this study is similar to the findings of previous studies done in this area. For example, the study carried out by Alhomayani *et al*. (2022), to assess the awareness level of deep vein thrombosis in the general population living in the Western region of Saudi Arabia, discovered a low grade of awareness of DVT. The most identified risk factors for DVT in their study were overweight/obesity followed by long-term travel (6 hours), whether by car/plane (85% and 67.1%, respectively). The finding is also similar to that of a study by Alyahya *et al*. (2020), that assessed the Saudi public awareness of venous thromboembolism in Riyadh city, Saudi Arabia, where immobility and older age (65+) were the most identified risk factors with a percentage of 54.40% and 43.80% respectively, and the respondents were less aware that PE is one of the most serious consequences of DVT.

Another study by Almodaimegh *et al*. (2017) at the King Abdul-Aziz Medical City in Riyadh, Saudi Arabia to assess the knowledge of venous thromboembolism and thromboprophylaxis among hospitalized patients also recorded that the degree of knowledge of DVT among hospitalized patients was low (15%) and the level of knowledge of signs and symptoms of DVT was relatively low (19%). Another research conducted in the United Kingdom revealed that overall understanding of DVT was low. Also, a Saudi study done on females who use oral contraceptive pills to assess their awareness about venous thromboembolism discovered that the knowledge of the DVT risk factors related to OCP use was low (Almegren *et al*., 2021). This is consistent with the discovering of the present study. This work revealed that no one of the participants had excellent knowledge about DVT, 30% had fair knowledge and 68% had poor knowledge. The lack of knowledge of deep vein thromboembolism is a common problem worldwide that is not limited to distinct patient nationalities or populations. Studies involving pregnant women, postnatal women, and cancer patients have reached similar conclusions (Kim & Kim, 2019).

Knowledge Level of the Respondents about Prevention of Deep Vein Thromboembolism

The findings of this study show that majority of the respondents (349; 83.1%) correctly identified the benefits of walking or stretching the legs for the prevention of deep vein thromboembolism. However, other prevention strategies correctly identified were early ambulation after a major surgery (342; 81.4%), elevation of the legs (253; 60.2%) and use of drugs like heparin (249; 59.2%). However, a relatively high percentage of activities like washing or bathing regularly (314; 74.7%), eating lots of fiber (270; 64%), and drinking a lot of fluids (190; 45.2%) were incorrectly identified as measures that may prevent deep vein thromboembolism. This finding is similar to the findings of Kim, E. and Kim, H. (2019) who carried out a study to identify knowledge, awareness, and risk of occurrence of venous thromboembolism among pregnant women. The result showed that the mean score of subjects' knowledge of venous thromboembolism was 4.47 (0–15), mean score of subjects' awareness of venous thromboembolism was 66.98 (25–100), and mean score of subjects' risk factor of venous thromboembolism was 0.98 (0–44). Increased patient awareness of the risk factors and prevention of DVT and thromboprophylaxis may promote patient safety by facilitating active participation in recommended activities such as early ambulation and calf-pumping exercises, education on healthy diet, weight control, brisk walking, regular monitoring of blood pressure, adequate fluid intake, smoking and alcohol cessation,

managing the side effects of estrogen, practice of static stretching exercises and follow up advice aimed at reducing the occurrence of deep vein thrombosis.

Level of Knowledge of the Risk factors of Deep Vein Thromboembolism Based on Gender

The study showed the level of knowledge of the risk factors of DVT based on the gender of the respondents. The female respondents indicated the higher population with good knowledge (6; 1.4%) and fair knowledge (72; 17.1%) compared to the males who had 2(0.4%) in the good knowledge and 54 (12.8%) in the fair knowledge category. Both the males and females had higher frequencies in the respondents that had no knowledge about the risk factors of deep vein thromboembolism. Chi-square test further indicated lack of significant association (p = 0.20) between gender and the level of knowledge of the risk factors of DVT among the respondents. The null hypothesis which states that there is no significant difference in the level of knowledge of the risk factors of DVT based on gender was accepted.

This finding was similar to the findings of another study carried in Saudi on females who use oral contraceptive pills to assess their awareness about venous thromboembolism. It was discovered that knowledge of the risk factors of DVT and PE related to Oral Contraceptive Pill use was low (Almegren *et al.*, 2021). On the contrary, a non-significant relationship was found between mean knowledge scores and participants' gender, marital status, nationality, residence, and having chronic diseases.

CONCLUSION

Deep vein thromboembolism is a multifactorial disease with both environmental and genetic related risk factors. Deep vein thromboembolism is a significant threat to individuals that causes various compilations leading to death as well as financial burden for community. Most risk factors of DVT were overweight/obesity and long-term travel for at least 6 hours. However, the most presenting symptoms were pain and discomfort. The study demonstrated that participants with an age of over 60 years, those of higher education and those who were working in any health specialty were among the respondents who reported having knowledge about DVT.

Implication of the Findings to Nursing

The patients' knowledge of the risk factors and prevention of deep vein thromboembolism is relatively low compared to other diseases internationally, and studies on venous thromboembolism have mainly been focused on nurses and medical staff. To the best of the researcher's knowledge, this is the first study on knowledge of the risk factors and prevention of deep vein thromboembolism among adult patients admitted in FMC, Asaba, Delta State and the finding showed that their knowledge of the risk factors and prevention of deep vein thromboembolism is significantly low. The implications of this finding to nursing practice, education, and/or policy is the necessity to offer a health education programme and to provide proper information and prophylaxis about venous thromboembolism. The findings of this study may also encourage healthcare providers to deliver more health education to

patients and public health organizations about DVT and the risk factors, signs and symptoms and preventive measures.

RECOMMENDATIONS

The researchers recommended that more attention must be paid to patient education to ensure safe and high-quality patient care. The low level of knowledge of the DVT risk factors revealed from this study necessitates community education campaigns about DVT risk factors, symptoms, and complications.

REFERENCES

Agnelli, G. and Becattini, C. (2019). "Acute pulmonary embolism," *The New England Journal of Medicine*, 363 (3), 210–274.

Alhomayani, F. K., Alsukhayri, D. A., Alnemari, S. M., Al-thubaiti, S. W., Alosaimi, M. M. and Alzahrani, K. T. (2022). Awareness level of deep vein thrombosis in the general population living in the Western region of Saudi Arabia. *Journal of Family Medicine and Primary Care,* 11(5), 1721-1727. Doi: 10.4103/jfmpc.jfmpc_1175_21

Almegren. M., Eid, A.B., Alsuhaibani, E., Albarrak, Y., Alfouzan, S., Alzahrani, A., et al. (2021). Awareness about venous thromboembolism among Saudi female who use oral contraceptive pills: A descriptive cross-sectional study. *International Journal of Medical Science and Diagnostic Research*.2021; 5:52–8.

Almodaimegh, H., Alfehaid, L., Alsuhebany, N., Bustami, R., Alharbi, S., Alkatheri, A. and Albekairy, A. (2017). Awareness of venous thromboembolism and thromboprophylaxis among hospitalized patients: A cross-sectional study. *Thrombosis Journal*, *15*(1), 19. https://doi.org/10.1186/s12959-017-0144-2.

Alyahya, K.I., Alangari, F.S., Saja, D.K., Alothaim, L.O., Albugami, S.J. and Alharbi, S.O. (2020). Public awareness of venous thromboembolism in Riyadh, Saudi Arabia. *International Journal of Advanced and Applied Sciences*.2020; 7:125–9.

Badireddy, M. and Mudipalli, V. R. (2022). Deep Venous Thrombosis Prophylaxis. In *Stat Pearls*. Stat Pearls Publishing. http://www.ncbi.nlm.nih.gov/books/NBK534865/

Elisha, S., Heiner, J., Nagelhout, J. and Gabot, M. (2018). Venous thromboembolism: New concepts in perioperative management. *AANA Journal,* 83(3), 211-223. Retrieved from http://ezproxy.acu.edu:4658/ehost/results.

Faria, C., Antunes, H., Pontes, T., Antunes, A., Martins, S. and Carvalho, S. (2019). Deep venous thrombosis of lower limbs in adolescents: A study in a tertiary hospital. *International Journal of Adolescent Medicine and Health*, *33*(2). https://doi.org/10.1515/ijamh-2018- 0137.

Gibbs, J. Fletcher, P. and Blombery, H. (2019). "Venous thromboembolism prophylaxis guideline implementation is improved by nurse directed feedback and audit," *Thrombosis Journal*, 9 (1), 7.

Ho, W. K. (2020) "Deep vein thrombosis risks and diagnosis," *Australian Family Physician*, 39 (7), 468–474.

Kahn, S. R. (2019). "The post thrombotic syndrome," *Thrombosis Research*, vol. 127, supplement 3, S89–S92.

Kiflie, A. M., Mersha, A. T., Workie, M. M., Admass, B. A., Ferede, Y. A. and Bizuneh, Y. B. (2022). Assessment of knowledge, attitude, practice and associated factors of venous thromboembolism prophylaxis among health professionals. A cross sectional study. *International Journal of Surgery Open*, *39*, 100436.

Kim, E. S. and Kim, H. Y. (2019). Knowledge, Awareness and Risk of Occurrence of Venous Thromboembolism of Perinatal Women. *Korean Journal of Women Health Nursing*. Jun; 25(2):154-168 https://doi.org/10.4069/kjwhn.2019.25.2.154pISSN 2287-1640·eISSN 2093-7695.

Labiche, E. A. (2019). Venous Thromboembolism Prevention Education for Practitioners in the Acute Care Setting: https://scholarworks.waldenu.edu/dissertation

Maynard G. (2018, August). Preventing hospital-associated venous thromboembolism: A guide for effective quality improvement (2nd Ed.). Agency for Healthcare Research and Quality. *AHRQ Publication No. 16-0001-EF*. https://www.ahrq.gov/sites/default/files/publications/files/DVTguide.pdf.

McLendon, K., Goyal, A. and Attia, M. (2022). Deep Venous Thrombosis Risk Factors. In *Stat Pearls*. Stat Pearls Publishing. http://www.ncbi.nlm.nih.gov/books/NBK470215/

Riback, W. and Wessels, P. (2021). The use of deep vein thromboembolism prophylaxis in relation to patient risk profiling – TUNE-IN Study. *South African Medical Journal,* 102(2),85-89.doi:10.7196/SAMJ.4859

Yohannes, S., Abebe, T., Endalkachew, K. and Endeshaw, D. (2022). Nurses' Knowledge, Perceived Practice, and their Associated Factors regarding Deep Venous Thrombosis (DVT) Prevention in Amhara Region Comprehensive Specialized Hospitals, Northwest Ethiopia, 2021: A Cross-Sectional Study. *Critical Care Research and Practice*, *2022*, 1– 9. https://doi.org/10.1155/2022/7386597.