

A STUDY TO ASSESS THE RISK FACTORS AND KNOWLEDGE OF DEEP VEIN THROMBOSIS AMONG PATIENTS ADMITTED IN A SELECTED TERTIARY CARE HOSPITAL

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ABSTRACT

Purpose: Assess the risk factors and knowledge of Deep Vein Thrombosis among patients admitted to a selected tertiary care hospital.

Methods: The present study adopted a descriptive design. 250 patients admitted in selected wards, who met the inclusion criteria, were recruited using a convenience sampling technique. In this study, DVT risk assessment score (Caprini) self-structured questionnaires were used to collect the data on patients' knowledge on deep vein thrombosis.

Major Findings: Study results shows that, (46%) of the participants have low risk of Deep Vein Thrombosis, around (39.2%) of participants have moderate risk of Deep Vein Thrombosis, and about (14.8%) of them have high risk of Deep Vein Thrombosis. The majority (78.80%) of the participants have inadequate knowledge, around (19.20%) of them have moderate knowledge, and about (2.00%) of them have adequate knowledge on Deep vein thrombosis. It revealed that there was no significant association between level of knowledge with background variables except for ward ($p < 0.05$)

Conclusion: The study concludes that the majority of the patients had inadequate knowledge on deep vein thrombosis. Furthermore, very good knowledge can be expected if the patients undergoes effective education on prevention and management on Deep vein thrombosis

Keywords: *risk factors, knowledge, deep vein thrombosis.*

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Introduction

Venous thromboembolism (VTE), encompassing deep vein thrombosis (DVT) and pulmonary embolism (PE), is a major global public health problem and a significant cause of morbidity and mortality. VTE occurs when a blood clot forms within the deep venous system, most commonly in the lower extremities, including the calf, thigh, and pelvic veins, although it may also occur in the upper extremities and other deep venous sites (World Health Organization [WHO], 2021; Mousa et al., 2022).

Deep vein thrombosis may present as an acute condition requiring urgent medical attention or as a chronic disorder resulting in progressive venous insufficiency and circulatory complications. Pulmonary embolism, the most serious complication of DVT, occurs when part of a thrombus dislodges and travels to the pulmonary arteries, potentially causing sudden death (Mousa et al., 2022). Common clinical manifestations of PE include dyspnea, chest pain, syncope, pre-syncope, and unexplained shortness of breath (Bosaeed et al., 2022).

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Venous thromboembolism is often referred to as a “silent killer” because many cases remain asymptomatic until serious complications develop. Delayed diagnosis remains a major concern, and approximately 10% of patients with pulmonary embolism die due to late recognition and treatment of the condition (Alhomayani et al., 2021). The burden of VTE is expected to increase globally owing to population aging, increasing prevalence of obesity, and growing numbers of high-risk individuals, particularly pregnant and postpartum women (Alhomayani et al., 2021).

The pathogenesis of VTE is primarily explained by Virchow’s triad, which consists of venous stasis, endothelial injury, and hypercoagulability. Numerous risk factors contribute to thrombus formation, including major surgery, prolonged hospitalization, immobilization, advanced age, obesity, trauma, stroke, malignancy, inflammatory bowel disease, pregnancy, long-distance travel, smoking, indwelling venous catheters, estrogen therapy, family history of thrombosis, and inherited thrombophilic disorders (Bosaeed et al., 2022; Shah et al., 2022). The risk is particularly elevated among patients hospitalized with acute medical illnesses due to pre-existing comorbidities, sepsis, trauma, and post-admission complications (Shah et al., 2022).

Globally, VTE is recognized as the third leading cause of death among hospitalized trauma patients. Despite the use of thromboprophylaxis, the reported incidence ranges from 5% to 20%, reflecting variations in patient characteristics, prophylactic strategies, and methods of VTE detection (Modi et al., 2016). Among patients with traumatic fractures of the lower extremities and spine undergoing surgical intervention, the incidence of VTE has been reported to range from 45% to 84% in Western populations, with approximately 1–2% developing fatal pulmonary embolism (Gupta, 2013).

In India, studies have reported DVT incidence rates ranging from 8% to 20% following major lower-limb surgery. Malignancy has been identified as a contributing risk factor in approximately 31% of affected patients (WHO, 2022). Furthermore, DVT occurs in approximately 15–20% of hospitalized patients, and pulmonary embolism remains a potentially fatal complication. It has been estimated that approximately 1% of adults over 50 years of age in India are affected by DVT (Antony et al., 2016).

The incidence of VTE in the general population is estimated to be approximately 1 per 1,000 persons annually, with DVT accounting for nearly two-thirds of cases and PE for the remaining one-third (Cushman, 2008). The annual incidence of DVT alone is estimated at 80 cases per 100,000 population, with a prevalence of

approximately 1 per 1,000 individuals (Huang, 2022). In the United States, more than 200,000 individuals develop venous thrombosis each year, and approximately 50,000 of these cases are complicated by pulmonary embolism (Huang, 2022). However, because many cases are asymptomatic and remain undiagnosed until autopsy, the true burden of disease is likely underestimated.

Travel-related VTE has also emerged as a recognized health concern. The incidence of traveler-associated VTE is estimated to range from 0.4 to 3 per 10,000 population annually, while the incidence of flight-related DVT has been reported as 1–2.5 per 10,000 travelers (Fowkes et al., 2003).

The long-term consequences of DVT contribute substantially to the disease burden. Post-thrombotic syndrome develops in approximately 43% of patients within two years following DVT, including 30% with mild disease, 10% with moderate disease, and 3% with severe manifestations. Recurrence rates may reach 25%, highlighting the chronic and relapsing nature of the condition (WHO, 2021). Mortality remains considerable, with approximately 6% of patients with DVT and 10–12% of patients with PE dying within one month of diagnosis (WHO, 2021; Cushman, 2008).

Public awareness regarding VTE remains inadequate despite its significant health impact. A study conducted among elderly patients and caregivers following hip fracture surgery reported that although 80% had heard of DVT, knowledge regarding risk factors varied considerably. Prolonged immobility, trauma, long-distance air travel, and cancer were identified as important risk factors by participants, indicating persistent gaps in understanding and awareness (Alhomayani, 2022).

Given the substantial morbidity, mortality, recurrence risk, and preventable nature of VTE, improving awareness, early recognition, risk assessment, and implementation of evidence-based thromboprophylaxis remains a critical priority for healthcare professionals and healthcare systems worldwide.

Methodology

A quantitative research approach with a descriptive study design was adopted to assess the risk factors and knowledge of deep vein thrombosis (DVT) among hospitalized patients. The study was conducted at Sri Ramachandra Hospital, Porur, Chennai, among patients admitted to the orthopaedic, oncology, and surgical wards. A total of 250 patients were recruited using a convenience sampling technique.

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Data were collected using the Caprini DVT Risk Assessment Tool and a self-structured questionnaire to assess patients' knowledge regarding DVT. Knowledge scores were interpreted as inadequate (<50%), moderate (51–75%), and adequate (76–100%).

Data collection was conducted after obtaining the necessary institutional and ethical approvals. Participants were informed about the purpose of the study, and written informed consent was obtained prior to participation. Confidentiality and anonymity of the participants were maintained throughout the study. Ethical approval for the study was obtained from the Institutional Ethics Committee of Sri Ramachandra Institute of Higher Education and Research (Ref. No. CSP/23/APR/127/339), and permission was secured from the respective ward authorities before commencement of the study.

Results

The study findings showed that majority (78.80%) of the participants had inadequate knowledge, around (19.20%) of the participants had moderate knowledge, and about (2.00%) had adequate knowledge on Deep vein thrombosis.

There was a no statistically significant association found between attitude towards risk factor and patient knowledge on deep vein thrombosis except for the ward.

Table 1 Frequency and distribution of participants based on demographic variables

Demographic variables	Frequency (n)	Percentages (%)
Age in years		
21-30	30	12.00
31-40	30	12.00
41-50	65	26.00
51-60	64	25.60
60 & above	61	24.40
Gender		
Male	133	53.20
Female	117	46.80
Marital Status		
Married	226	90.40
Unmarried	24	9.60
Religion		
Hindu	224	89.60

Muslim	18	7.20
Christian	8	3.20
Education Qualification		
Primary	91	36.40
Secondary	92	36.80
Higher Secondary	43	17.20
Undergraduate	23	9.20
Postgraduate	1	0.40

Table 1 shows that, the majority (26.00%) of the participants were in the age group of 41-50 years, most(53.20%)of them were males, majority (90.40) of were married, most(89.60) of them were Hindus, majority(36.80%) of them have secondary education.

Table 2 Descriptive analysis of clinical variable in the study population (N=250)

Clinical variables	Frequency(n)	Percentages (%)
Ward		
Oncology	67	26.80
Orthopaedics	97	38.80
Surgical	86	34.40
Co Morbidities		
Diabetis mellitus	85	34.00
Hypertension	67	26.80
Others	98	39.20
Length of Hospital Stay		
<One week	119	47.60
>One week	131	52.40
Previous History of DVT		
Yes	12	4.80
No	238	95.20
Habit of Smoking		
Yes	44	17.60
No	206	82.40
Habit of Alcohol		

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Yes	59	23.60
No	191	76.40
Previous History of Surgery		
Yes	64	25.60
No	186	74.40
BMI		
<18.5	18	7.20
18.5 - 24.9	126	50.40
30 - 34.9	92	36.80
35- 39.9	9	3.60
>40	5	2.00

Table 2 shows that, majority(38.80%) of the participants were admitted in the orthopaedics ward, most(34.00%) of them co morbidities were diabetis mellitus, most(52.40%) of their length of stay were more than one week, most(95.20%) of them not having previous history of DVT, majority(82.40%)of them not having the habit of smoking, most(76.40%) of them not having the habit of consuming alcohol,majority974.40%) of them not having previous history of surgery, most (50.40%) of their BMI were 18.5-24.9.

Table 3 Comparison of DVT risk score interpretation across knowledge (N=250)

Dvt Score Interpretation	Knowledge			Chi square	P value
	Inad equate Know led ge (N=197)	Mod erate Know led ge (N=48)	Ade quat e Know led ge (N=5)		
Low Risk	93 (47.21%)	18 (37.5%)	4 (80%)	4.108	0.392
Moderate Risk	76 (38.58%)	21 (43.75%)	1 (20%)		
High Risk	28 (14.21%)	9 (18.75%)	0 (0%)		

Table 3 shows that, majority (47.21%)of the low risk participants had inadequate knowledge, around(38.58%) of the moderate risk participants had moderate level of knowledge and about (14.21) of the high risk

participants had adequate knowledge on Deep vein thrombosis.

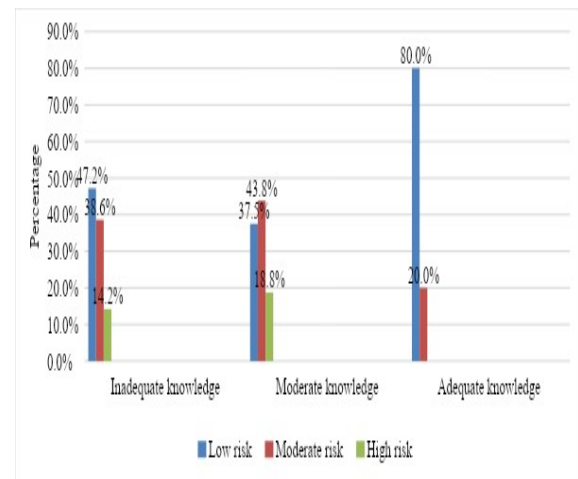


Figure 1 Cluster bar chart of comparison of DVT score interpretation across knowledge (N=250)

Table 4 Frequency and percentage distribution of participants based on knowledge of DVT (N=250)

Knowledge	Frequency(n)	Percentages(%)
Inadequate knowledge	197	78.80%
Moderate knowledge	48	19.20%
Adequate knowledge	5	2.00%

Table 4 shows that, majority (78.80%) of the participants have inadequate knowledge, around(19.20%)of them have moderate knowledge ,about (2.00%)of them have adequate knowledge on Deep vein thrombosis.

Table 5 Mean and Standard deviation of knowledge on Deep Vein Thrombosis among Patients (N=250)

Paramet er	Mea n ± SD	Medi an	Minim um	Maxim um
Deep Vein Thromb osis	34.86 % ± 19.28 %	36.00 %	0.00%	88.00%

Table 6 Association between the level of Knowledge on Deep Vein Thrombosis with selected Background variables

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Demographic variables	Levels of Knowledge						Chi square	p value
	Inadequate Knowledge		Moderate Knowledge		Adequate Knowledge			
	n	%	n	%	n	%		
Age in years							3.986	0.858 (N S)
21-30	23	11.68	6	2.5	1	20		
31-40	21	10.66	8	6.67	1	20		
41-50	52	26.4	11	2.92	2	40		
51-60	51	25.89	13	7.08	0	0		
60 & above	50	25.38	10	0.83	1	20		
Gender							4.873	0.087 (N S)
Male	101	51.27	52	6.25	5	100		
Female	96	48.73	21	3.75	0	0		
Marital Status							1.302	0.521 (N S)
Married	180	91.37	42	7.5	4	80		
Unmarried	17	8.63	6	2.5	1	20		
Religion							5.974	0.201 (N S)
Hindu	175	88.3	45	9.375	4	80		

Muslim	16	8.12	2	4.17	0	0	10.349	0.241 (N S)
Christian	6	3.05	1	2.08	1	20		
Education Qualification								
Primary	76	38.58	15	31.25	0	0		
Secondary	76	38.58	14	29.17	2	40		
Higher Secondary	28	14.21	3	7.08	2	40		
Undergraduate	16	8.12	6	12.5	1	20	10.349	0.241 (N S)
Postgraduate	1	0.51	0	0	0	0		

Clinical variables	Levels of Knowledge						Chi square	p value
	Inadequate Knowledge		Moderate Knowledge		Adequate Knowledge			
	n	%	n	%	n	%		
Ward							24.767	<0.001(S)
Oncology	59	29.95	8	16.67	0	0		
Orthopaedics	61	30.96	32	66.67	4	80		
Surgical	77	39.09	8	16.67	1	20		

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Co Morbities								
Diabetes Mellitus	71	36 · 04	13	27 · 08	1	20		
Hypertension	58	29 · 44	8	16 · 67	1	20	8.856	0.065 (S)
Others	68	34 · 52	27	56 · 25	3	60		
Length of Hospital Stay								
<One Week	95	48 · 22	23	47 · 92	1	20	1.560	0.458 (N S)
>One Week	102	51 · 78	25	52 · 08	4	80		
Previous History of Dvt								
Yes	9	45 · 7	3	62 · 5	0	0	0.496	0.780 (N S)
No	188	95 · 43	45	93 · 75	5	100		
Habit of Smoking								
Yes	40	20 · 3	3	62 · 25	1	20	5.277	0.071 (N S)
No	157	79 · 7	45	93 · 75	4	80		

Habit of Alcohol								
Yes	45	22 · 84	13	27 · 08	1	20	0.422	0.810 (NS)
No	152	77 · 16	35	72 · 92	4	80		
BMI								
<18.5	14	71 · 11	3	62 · 25	1	20		
18.5 - 24.9	99	50 · 25	25	52 · 08	2	40	5.511	0.702 (N S)
30 - 34.9	70	35 · 53	20	41 · 67	2	40		
35- 39.9	9	45 · 7	0	0	0	0		
>40	5	25 · 4	0	0	0	0		

(p<0.05-significant level, s:significant, NS:non significant)

Table 6 shows the association between the level of knowledge on Deep Vein Thrombosis with selected background variables among participants. chi-square test was computed find the significant association. It revealed that, there was no significant association between level of knowledge with background variables except for ward (p<0.05)

Discussion

This study assessed the risk factors and knowledge regarding deep vein thrombosis (DVT) among patients admitted to orthopaedic, oncology, and surgical wards. The findings revealed that nearly half of the participants (46%) were at low risk for DVT, while 39.2% were at moderate risk and 14.8% were at high risk. These findings indicate that a considerable proportion of

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hospitalized patients are vulnerable to developing DVT and require regular risk assessment and preventive interventions.

The present study also demonstrated that the majority of participants (78.8%) had inadequate knowledge regarding DVT, whereas only 19.2% had moderate knowledge and 2% had adequate knowledge. The poor level of knowledge observed among patients highlights the need for effective educational strategies to improve awareness of DVT risk factors, symptoms, complications, and preventive measures.

The findings are consistent with those reported by Faisal et al. (2022), who found that most participants had poor knowledge of DVT despite awareness of certain risk factors and symptoms. Similarly, Adam Boulton et al. (2015) reported limited public knowledge regarding DVT, its complications, and preventive measures, emphasizing the need for increased patient education and awareness programs.

The association analysis revealed that knowledge regarding DVT was significantly associated with the ward of admission ($p < 0.05$), whereas no significant association was found between knowledge and other selected demographic and clinical variables. This finding suggests that differences in exposure to health information and patient education across clinical settings may influence patients' understanding of DVT.

Overall, the study findings indicate that although many patients were at risk of DVT, their knowledge regarding the condition was inadequate. Therefore, routine DVT risk assessment and structured educational interventions should be incorporated into patient care to enhance awareness and promote early prevention of DVT-related complications.

Conclusion

The study concludes that the majority of the patients had inadequate knowledge on Deep vein thrombosis. Minimal number patients had moderate knowledge and very less patients had adequate knowledge on Deep vein thrombosis.

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