

# Awareness, knowledge, and attitude toward venous thromboembolism among Aseer Population, Saudi Arabia

Ali Al Bshabshe<sup>1</sup>, Wesam Faried Mousa<sup>2</sup>, Mohammed Sultan Alshehri<sup>3</sup>,  
Mazen Mohammed Saeed Alshahrani<sup>3</sup>, Omar Mohammed Alamri<sup>3</sup>,  
Fayez Saeed Alshehri<sup>3</sup>, Mohammed Ali AlFlan<sup>3</sup>, Afnan Sultan Alshehri<sup>3</sup>

<sup>1</sup>Department of Medicine/adult Critical Care Division, College of Medicine, King Khalid University, Abha, Kingdom of Saudi Arabia, <sup>2</sup>Anesthesia and ICU, Colleague of Medicine, University of Tanta, Egypt, <sup>3</sup>Medical Student, Department of Medicine, College of Medicine, King Khalid University, Abha, Kingdom of Saudi Arabia

## ABSTRACT

**Objectives:** Calls to carry efforts to increase awareness about venous thromboembolism (VTE) as a preventable major healthcare problem with serious consequences has been upraised. This study was planned to get an overview of the awareness, knowledge, and attitude toward VTE among Aseer population, Saudi Arabia and the need for an education plan. **Materials and Methods:** Questionnaire composed of 35 questions based cross-sectional study was conducted online via Google documents to public in Aseer that included both genders aged more than 18 years who agreed to be involved in the study, to assess knowledge and attitude toward VTE. The collected data were presented as numbers, percentages, and were analyzed using Statistical Package for Social Sciences version 24. **Results:** The results of the data showed that awareness knowledge and attitude toward VTE were lacking and unsatisfactory. **Conclusion:** Diligence to spread knowledge and awareness of VTE among public in Aseer is required. Further surveys involving other populations are warranted.

**Keywords:** Aseer, attitude, awareness, knowledge, questionnaire, Saudi Arabia, thromboembolism, venous

## Introduction

Worldwide, VTE is a leading cause of morbidity and mortality<sup>[1]</sup> with considerably high economic burden.<sup>[2]</sup> VTE-related morbidity and mortality can be vetoed by proper use of thromboprophylaxis in at risk patients.<sup>[3,4]</sup> Hard work to prevent VTE has extended from focusing on hospitalized at-risk patients to raise public awareness about VTE<sup>[5]</sup> with adoption of healthy lifestyles<sup>[6]</sup> and implementation of pre-emptive strategies.<sup>[7,8]</sup> Insightful data about the level of knowledge and awareness among population are essential for future projects for prevention.

**Address for correspondence:** Dr. Ali Al Bshabshe, Department of Medicine/Adult Critical Care Division, College of Medicine, King Khalid University, Abha, Kingdom of Saudi Arabia. E-mail: albshabshe@yahoo.com

Received: 09-12-2020

Revised: 21-02-2021

Accepted: 23-02-2021

Published: 02-07-2021

### Access this article online

#### Quick Response Code:



Website:  
www.jfmpc.com

DOI:  
10.4103/jfmpc.jfmpc\_2430\_20

The aim of this study was to assess awareness for causes, risk factors, signs, symptoms, prevention, and treatment options toward VTE among Aseer population, Saudi Arabia.

## Methods

After approval by the local ethical committee, a questionnaire based cross-sectional study composed of a total of 35 questions was conducted online via Google documents that was sent through social media to public in Aseer region, Saudi Arabia from 01 December till 31 December 2018.

Our study included both genders aged more than 18 years who agreed to be involved in the study. Participants working or studying in the medical field were excluded. Consecutive sampling technique was used in which every subject meeting

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow\_reprints@wolterskluwer.com

**How to cite this article:** Al Bshabshe A, Mousa WF, Alshehri MS, Saeed Alshahrani MM, Alamri OM, Alshehri FS, *et al.* Awareness, knowledge, and attitude toward venous thromboembolism among Aseer Population, Saudi Arabia. J Family Med Prim Care 2021;10:2411-5.

the criteria of inclusion is selected until the required sample size is achieved.

Nine questions were included to assess the degree of awareness of population toward the most common VTE-related medical illnesses namely pulmonary embolism (PE), deep vein thrombosis (DVT), stroke, hypertension (HTN), heart attack, breast cancer, blood clotting, AIDS, and prostate cancer. A Likert scale of 1–5 was employed to assess degree of worries about the aforementioned medical concerns as well as five more additional questions assessing the level of public worries toward occurrence of VTE in people under age of 40 years, probabilities of VTE anticipated prevention, likelihood VTE progression to PE, far-seeing VTE as a medical emergency and its possibility of causing death. When responding to a Likert item, respondents specify their level of worries on a symmetric worried-unworried scale for a series of statements. Thus, the range captures the intensity of their worry for a given item. Additionally, we assessed the opinion of the participants about the best treatment of VTE whether it is medications, surgery, or herbal medicine.

Eight questions were included to assess awareness about likely symptoms of PE namely shortness of breath (correct), slow shallow breathing (wrong), chest pain that worsens with deep breath (correct), rapid heart rate (correct), light headedness or passing out (correct), pain radiating down the arm [wrong, coughing blood (correct)], and frequent headaches (wrong).

Three questions were included to assess included questions about DVT in legs that assessed awareness, knowledge of its description (a blood clot in the vein or lack of oxygen in the vein or unsure), symptoms in the legs namely swelling (correct), itching (wrong), pain or tenderness (correct), noticeable changes in color (correct) and warmth on touch (correct), and risk factors namely hospital stay (correct), surgery (correct), cancer (correct), not moving for long time (correct), pregnancy or just having childbirth (correct), using estrogen based medications (correct), family history of blood clotting (correct), older age (65+) (correct), too much exercise (wrong) and high blood cholesterol (wrong) and, last, we assessed the main sources of information that public got their medical knowledge about VTE from: Friend, specialist, internet, or television

Statistical Package for Social Science version 24 (SPSS Japan Inc., Tokyo, Japan) was used for statistical analysis. Descriptive statistics were presented in the form of numbers, percentages, means, and standard deviation. Statistical significance was considered at  $P < 0.05$ . The study was approved from the REC of the King Khalid University (REC#05-59) date of approval was 23-10-2018.

## Results

A total of 409 questionnaires were answered and returned back. Sixteen of them were excluded as they were answered by medical students or persons working in medical fields

whereas 396 answered questionnaire were included in the study. Participants' age extended from 18 to 39 ( $n = 175$ , 44.2%), 40–65 ( $n = 215$ , 54.3%), and above 65 years ( $n = 6$ , 1.5%). Male gender constituted 216 of participants (54.5%) while females were 180 (45.5%). Participants' level of education ranged from primary school ( $n = 3$ , 0.8%), secondary school ( $n = 118$ , 29.8%), university degree ( $n = 246$ , 62.1%), and postgraduates ( $n = 29$ , 7.3%).

**Table 1: Likert scale**

Worries	Likert scale					Mean
	1.00	2.00	3.00	4.00	5.00	
PE						
Frequency	153	67	102	25	49	2.15
Percent	38.60	16.90	25.80	6.30	12.40	
DVT						
Frequency	132	78	104	37	45	2.70
Percent	33.30	19.70	26.30	9.30	11.40	
Stroke						
Frequency	102	79	97	45	73	3.20
Percent	25.80	19.90	24.50	11.40	18.40	
HTN						
Frequency	65	59	120	57	95	3.00
Percent	16.40	14.90	30.30	14.40	24.00	
Heart attack						
Frequency	75	59	124	65	73	2.70
Percent	18.90	14.90	31.30	16.40	18.40	
Breast cancer						
Frequency	216	43	29	69	39	2.45
Percent	54.50	10.90	7.3	17.4	9.9	
Blood clotting						
Frequency	92	76	111	57	60	1.90
Percent	23.20	19.20	28.00	14.40	15.20	
AIDS						
Frequency	227	62	44	15	48	2.30
Percent	57.30	15.70	11.10	3.80	12.10	
Prostate cancer						
Frequency	180	59	36	72	49	1.20
Percent	45.50	14.90	9.10	18.20	12.40	
People <40 y should worry about VTE?						
Frequency	120	72	113	54	37	2.53
Percent	30.30	18.20	28.50	13.60	9.3	
Most of VTE cannot be prevented						
Frequency	94	79	140	37	46	2.65
Percent	23.70	19.90	35.40	9.30	11.60	
DVT cannot progress to PE						
Frequency	110	73	150	30	33	2.50
Percent	27.80	18.40	37.90	7.60	8.30	
VTE is not a medical emergency						
Frequency	219	53	71	18	35	1.98
Percent	55.30	13.40	17.90	4.50	8.80	
VTE can cause death						
Frequency	27	17	69	51	232	4.12
Percent	6.80	4.30	17.40	12.90	58.60	

### Awareness, knowledge, and attitude of population toward the most common VTE-related medical illnesses

“Yes” answers for the nine awareness questions about medical illnesses were more than “No” answers in all questions, but significance was detected in questions concerning awareness about heart attack, breast cancer, blood clotting, AIDS, stroke, prostate cancer ( $P < 0.05$ ) but was not in questions about PE and DVT [Figure 1]. Mean Likert scale for worries about the same aforementioned medical illnesses as well as for public worries toward occurrence of VTE in people under age of 40 years, probabilities of VTE anticipated prevention, likelihood VTE progression to PE, far-seeing VTE as a medical emergency and its possibility of causing death were shown in Table 1.

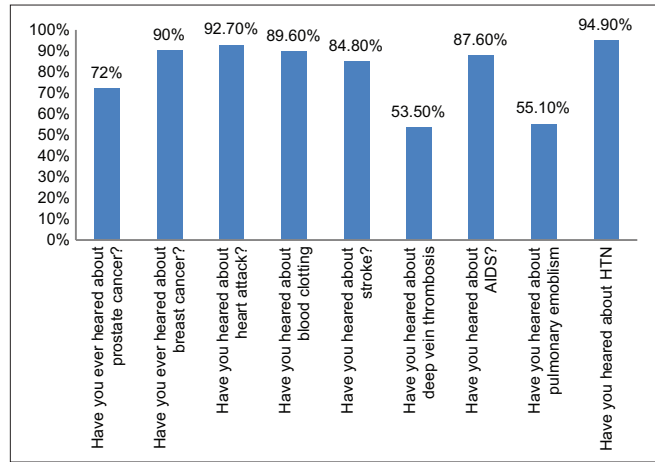


Figure 1: Knowledge about medical illnesses, Yes alone

### Knowledge and awareness about the best treatment of VTE

Significantly correct answer was obtained for participant’s opinion regarding the best treatment of VTE showed that medication was their first choice (73.5%), surgery (24.5%) then herbal medications (2%). The source of information for participants was internet (55.8%), specialist (39.9%), television (4.1%), and friends (0.3%).

### Awareness about symptoms and signs of PE

Significantly ( $P < 0.05$ ) low number of participants had picked correct answers for symptoms of PE namely shortness of breath (25%), chest pain that worsens with deep breath (23%), rapid heart rate (15%), light headedness or passing out (4%), and coughing of blood (11%). On the other hand, significantly low number of participants ( $P < 0.05$ ) picked the “wrong” choices as correct answers for symptoms of PE namely slow shallow breathing (13%), pain radiating down the arm (5%), and frequent headaches (4%) [Figure 2].

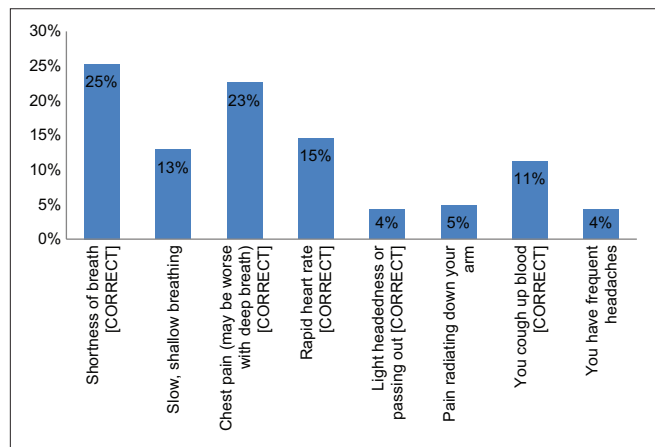


Figure 2: Symptoms and signs of PE

### Awareness about symptoms and signs of DVT

Similarly, 77% of participants were unaware of DVT ( $P < 0.05$ ) but, however, 68% of participants had a correct answer describing it (blood clot in a vein) while 10% described it as lack of oxygen in the leg and 22% were unsure of its description. For symptoms and signs of DVT, significantly low number of participants had picked “correct” choices as correct answers for symptoms of DVT namely swelling of the leg (26%), pain or tenderness in the leg (28%), noticeable changes in the skin color of the leg (27%), and the leg feels warm to the touch. On the other hand, significantly low number of participants picked the “wrong” choice of itching of the leg as a correct answers (3%) [Figure 3].

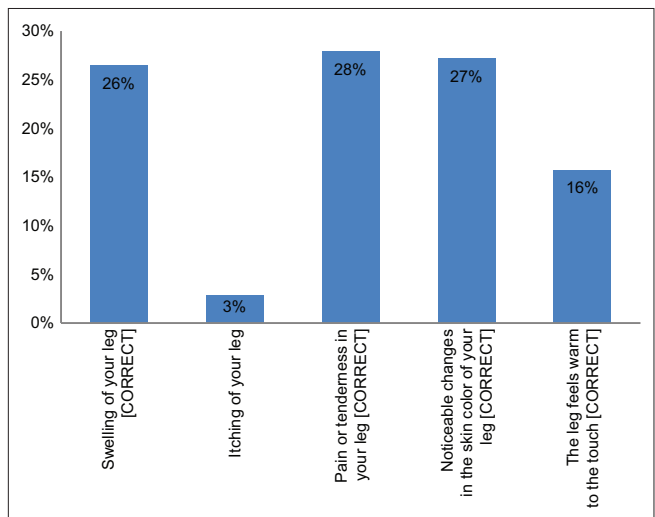


Figure 3: Symptoms and signs of DVT

For DVT risk factors, significantly ( $P < 0.05$ ) low number of participants had picked “correct” choices as correct answers namely; hospital stay (8%), surgery (1%), cancer (1%), not moving for long time (29%), pregnancy or just having childbirth (9%), using estrogen based medications (22%), family history of blood

clotting (12%), and older age (65+) (9%). On the other hand, significantly low number of participants picked the “wrong” choices as correct answers for symptoms of DVT namely too much exercise (5%) and high blood cholesterol (5%) [Figure 4].

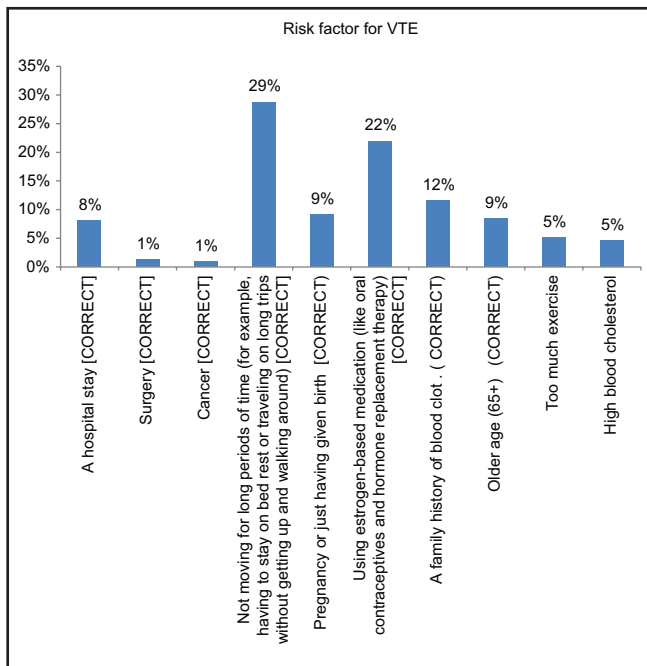


Figure 4: DVT risk factors

## Discussion

Thrombosis is a major cause of morbidity and mortality worldwide and significantly funds the economic disease burden.<sup>[9]</sup> Thrombophylaxis in hospitalized patients markedly decreased the incidence of VTE in that group of patients but, however, lack of public awareness and knowledge of use of thrombophylaxis in at-risk, no hospitalized patients, still contribute to high morbidity and mortality<sup>[10]</sup> with multiple calls to enhance public awareness of VTE.<sup>[11]</sup> This study provides an overview of awareness and knowledge toward VTE in Aseer region, KSA. It demonstrated significantly poor awareness and deficient knowledge about heart attack, breast cancer, blood clotting, AIDS, stroke, prostate cancer among Aseer population but was not significant about PE and DVT. A previous global survey<sup>[5]</sup> demonstrated lack of public awareness toward thrombotic disorders in general, VTE in particular. The relative more awareness and knowledge for PE and DVT in this survey compared to the global survey may be attributed to high education level and young age of the public enrolled in our survey and the probable increased awareness because of the 4-year difference between the two surveys.

Consistent with previous studies,<sup>[12,13]</sup> degree of worries about the aforementioned medical illnesses was considerably high along with the other questions assessing the public worries toward VTE occurrence under age of 40 years, probabilities of VTE anticipated prevention, likelihood VTE progression to PE, far-seeing VTE as a medical emergency and its possibility of causing death. Likewise, the public in our survey was also able to significantly identify the best way of treating VTE (i.e., medications). Those encouraging outcomes may reflect, as demonstrated in our results, the easy and fast ways to obtain information through internet and television as well as easier

communication with specialists. Also this may be, in part, due to disparate educational efforts of different regional health care providers.

Our survey revealed significantly poor awareness about PE symptoms. This shrunk awareness was also shown previously to be prevailing in outpatient settings,<sup>[14]</sup> among medical students,<sup>[15]</sup> hospital staff,<sup>[16]</sup> and hospitalized patients.<sup>[12]</sup> Decreased awareness found in this survey is consistent with the results of previous country-specific studies in United States of America,<sup>[17]</sup> Australia,<sup>[18]</sup> and Italy<sup>[19]</sup> as well as a global study.<sup>[5]</sup> Although the differences across the countries surveyed in terms of culture, language, and access to the Internet are inherent limitations for comparison, yet, the use of reliable methodology, consistency in the results can trust this appraisal. Lack of awareness of symptoms of PE made it one of the most underrated diseases.<sup>[20]</sup> Conditionally and in epidemiology terms, awareness about symptoms of PE is needed and crucial to carry out actions to decrease its prevalence.<sup>[5,21]</sup>

Similarly, our survey demonstrated significantly decreased awareness toward DVT of public in Aseer as well as to its symptoms and risk factors but, still, significant number of participants could correctly described it as a “blood clot in a vein” and this can be attributed to Labeling the disease by the name “deep venous thrombosis” and not because of real awareness. This is consistent with a previous street survey<sup>[22]</sup> that assessed public knowledge of DVT in Birmingham, UK using open questions that showed that knowledge of DVT was poor. In 2014, a survey<sup>[5]</sup> was conducted about public awareness and knowledge of the causes, signs, symptoms, and prevention of VTE in nine countries, including: U.S., U.K., Canada, Germany, Argentina, The Netherlands, Thailand, Australia, and Japan. On a global level, public awareness about thrombosis overall, and VTE in particular, is low. The highest awareness of DVT was in The United Kingdom (86%), while the lowest levels of awareness were in Japan (13%) and The Netherlands (20%).

In our survey, we chose to use closed-ended questions that was made up of pre-prepared answer choices for the respondent to choose from without allowing them to provide unique or unanticipated answers. This choice was used as our participants aren't mostly interested in our survey topic and we need to obtain quantifiable data and to categorize respondents. The potentially leading nature of closed-ended questions may artificially inflate awareness in our survey that was overcome by including incorrect options for many questions.

Our study is not without limitations. Although we aimed to make our survey descriptive of the overall population but, however, because the survey was conducted online, those without Internet access were not included who are possibly representing older ages and lower level of education. So, our results are likely to overestimate the extent of awareness. Our survey revealed significantly poor awareness about PE symptoms, 77% of participants were unaware of DVT, diligence to spread



knowledge, and awareness of VTE among public is required. This article emphasizes the importance of need of education and public awareness about VTE.

## Conclusion

We concluded that there is a lack of awareness and knowledge toward VTE among public in Aseer, KSA and there is strong need to improve their awareness and knowledge to achieve better VTE prophylaxis.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

## References

- Lyman GH, Culakova E, Poniewierski MS, Kuderer NM. Morbidity, mortality and costs associated with venous thromboembolism in hospitalized patients with cancer. *Thromb Res* 2018;164(Suppl 1):S112-8.
- Grosse SD, Nelson RE, Nyarko KA, Richardson LC, Rascob GE. The economic burden of incident venous thromboembolism in the United States: A review of estimated attributable healthcare costs. 2016;137:3-10.
- Agno W, Haas S, Weitz JI, Goldhaber SZ, Turpie AG, Goto S, *et al.* Characteristics and management of patients with venous thromboembolism: The GARFIELD-VTE registry. *Thromb Haemost* 2019;119:319-27.
- Schünemann HJ, Cushman M, Burnett AE, Khan SR, Westendorf JB, Spencer FA, *et al.* American society of hematology 2018 guidelines for management of venous thromboembolism: Prophylaxis for hospitalized and nonhospitalized medical patients. *Blood Adv* 2018;2:3198.
- Wendelboe AM, McCumber M, Hylek EM, Buller H, Weitz JI, Rascob G. Global public awareness of venous thromboembolism. *J Thromb Haemost* 2015;13:1365-71.
- Goldhaber SZ. Risk factors for venous thromboembolism. *J Am Coll Cardiol* 2010;56:1-7.
- Spyropoulos AC, McGinn T, Khorana AA. The use of weighted and scored risk assessment models for venous thromboembolism. *Thromb Haemost* 2012;108:1072-6.
- Brenner B, Hull R, Arya R, Westendorf JB, Douketis J, Elalamy I, *et al.* Evaluation of unmet clinical needs in prophylaxis and treatment of venous thromboembolism in high-risk patient groups: Cancer and critically ill. *Thromb J* 2019;17:6.
- Raskob GE, Angchaisuksiri P, Blanco AN, Buller H, Gallus A, Hunt BJ, *et al.* Thrombosis: A major contributor to global disease burden. *Semin Thromb Hemost* 2014;40:724-35.
- Kahn SR, Diendéré G, Morrison DR, Piché A, Filion KB, Klil-Drori AJ, *et al.* Effectiveness of interventions for the implementation of thromboprophylaxis in hospitalized patients at risk of venous thromboembolism: An updated abridged Cochrane systematic review and meta-analysis of randomised controlled trials. *BMJ Open* 2019;9:e024444.
- Bikdeli B. When the game demons take real lives: A call for global awareness raising for venous thromboembolism. *Thromb Res* 2012;129:207.
- Almodaimegh H, Alfehaid L, Alsuhebany N, Bustami R, Alharbi S, Alkatheri A, *et al.* Awareness of venous thromboembolism and thromboprophylaxis among hospitalized patients: A cross-sectional study. *Thromb J* 2017;15:19.
- Xu Y, Wang W, Zhao J, Wang J, Zhao T. Knowledge, attitude, and practice of healthcare professionals toward clinically applying graduated compression stockings: Results of a Chinese web-based survey. *J Thromb Thrombolysis* 2019;47:102.
- Spencer F. Venous thromboembolism in the outpatient setting. *Arch Intern Med* 2007;167:1471-5.
- Urbanek T, Wołkowski M, Zembura M, Witkowska J, Wojciechowska E, Kuczmik W. Venous thromboembolism awareness among medical students – intervention needed. *Phlebological Review* 2018;26:29-35.
- Tang X, Sun B, Yang Y, Tong Z. A survey of the knowledge of venous thromboembolism prophylaxis among the medical staff of intensive care units in North China. *PLoS One* 2015;10:e0139162.
- Beckman MG, Hooper WC, Critchley SE, Ortel TL. Venous thromboembolism: A public health concern. *Am J Prev Med* 2010;38:S495-501.
- Gaston S, White S. Venous thromboembolism (VTE) risk assessment: Rural nurses' knowledge and use in a rural acute care hospital. *Int J Nurs Pract* 2013;19:60-4.
- Gensini GF, Di Pasquale G, Vaccaro CM, Riva L, Iori I, Nozzoli C, *et al.* A census survey on atrial fibrillation awareness in the general population and among general practitioners and affected patients in Italy. *G Ital Cardiol (Rome)* 2014;15:37-43.
- Tomkowski WZ, Dybowska M, Kuca P, Andziak P, Jawień A, Ziaja D, *et al.* AVTERS investigators. Effect of a public awareness campaign on the incidence of symptomatic objectively confirmed deep vein thrombosis: A controlled study. *J Thromb Haemost* 2012;10:2287-90.
- Morrison R. Venous thromboembolism: Scope of the problem and the nurse's role in risk assessment and prevention. *J Vasc Nurs* 2006;24:82-90.
- Boulton A, Fenton M, Loka T, Sharif Z, Greenfield S. Public knowledge of deep vein thrombosis (DVT): A street survey in the suburbs of Birmingham, UK. *Qual Prim Care* 2015;23:40-6