

## General Population's Awareness of PE and DVT and its Risk Factor in Asir region, Saudi Arabia

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### ABSTRACT

**Study Design:** Cross-Sectional study

**Background:** Pulmonary embolism (PE) and deep vein thrombosis (DVT), often referred to as a single condition named venous thromboembolism (VTE), is a major reason for illness, disability, and sometimes even death. DVT is a medical condition characterized by formation of blood clots (thrombus) in deep veins, especially in the legs, e.g., in calf veins, femoral vein, or popliteal vein

**Results:** Total 801 respondents, respond the questionnaire, of which 81.8% belong to Aseer region, while 18.2% belongs to other regions. 64.8% belong to the 30-60 years age group, 31.3% were belongs to the age group of 18-30 years while under 18 were 2.4% and 1.5% were above 60. Only 11.5% have health carrier, 48.4% were employed, 20.8% were students, 21.7% were unemployed, while 9% were retired. 97.% have high-school level of education, 2.9% less than that, while 0.1 % have higher education

**Conclusion:** To conclude, the study demonstrates a mixed awareness among residents of Aseer region about of PE and DVT as well as its risk factors, symptoms and preventive measures. Although most respondents have basic knowledge about the disease, there is alarming level of misconceptions and ignorance among a significant chunk of the population.

**Keywords:** Pulmonary Embolism (PE) , Deep Vein Thrombosis, Awareness, Preventive

### BACKGROUND

Pulmonary embolism (PE) and deep vein thrombosis (DVT), often referred to as a single condition named venous thromboembolism (VTE), is a major reason for illness, disability, and sometimes even death. DVT is a medical condition characterized by formation of blood clots (thrombus) in deep veins, especially in the legs, e.g., in calf veins, femoral vein, or popliteal vein<sup>1</sup>. These clots can restrict, completely or partially, the blood circulation, which leads to pain, swelling, changes in skin, and local skin warming. Sometimes the fragmented particles of the clots travel through the veins to the lung, potentially obstructing the pulmonary vasculature. This condition is called pulmonary embolism or PE, which is the most significant complication of DVT that causes mortality.

Aziz et al (2020) identifies the major risk factors for DVT as recent surgical procedures, malignancy, physical trauma, immobilization, obesity, smoking, hormonal contraceptives, pregnancy and post-partum state, anti-phospholipids antibody syndrome, and some genetic disorders like deficiencies of anti-thrombin, protein C, and protein S, and factor V Leiden mutation.

Treatment of VTE starts with short-term use of a parenteral anticoagulant (and sometimes thrombolytic therapy), following which a vitamin K antagonist, most commonly warfarin, is used. The therapy's duration largely depends on whether the patient's continuing risk factors for recurrence of the condition. A lot of efforts have been made to quantify the risk of recurrent thrombosis. In case the patient continues to have a risk factor for thrombosis, anticoagulant therapy is often resumed, sometimes for lifelong. Such a patient is also kept away from exposure to any modifiable risk factors. Mechanical or pharmacological means are used to prevent thrombosis at high-risk times, for example, during hospitalization or pregnancy.

It is reported that worldwide about 1 in every 1000 people suffer from VTE every year<sup>4</sup>. The incidence rises at the age of 45 years and increases further after sixty. Only in the USA, per year approximately 60,000-100,000 deaths are caused by VTE<sup>1</sup>. The high morbidity and mortality associated with PE and DVT is largely attributed to the difficulty in its diagnosis as doesn't appear on clinical screening. Its prevention becomes even more difficult as the symptoms are not universal. Therefore, there is a need for the patients and the common

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people being educated about the condition so that its incidence can be reduced. A survey conducted on the streets of the UK demonstrated that women know more about DVT than men and that people over 70 years are less aware about it than any other age group<sup>2</sup>. Another study conducted worldwide on general people’s awareness of VTE has shown that less knowledge about the disease was associated with younger age and masculine gender<sup>3</sup>. Another study, conducted in a pre-operative assessment clinic in the UK, confirmed that most patients already have some knowledge about VTE. However, they lacked specific awareness regarding its risk factors and how to prevent them<sup>5</sup>.

In the context of Saudi Arabia, a quantitative observational cross-sectional study was conducted between September 2018 to March 2019 to determine awareness of VTE among residents in Riyadh, and to see if there is a difference in the level of awareness regarding gender and age<sup>6</sup>. The study showed that women have a significantly higher awareness of DVT and PE than men, while there was no remarkable difference in awareness as regard to age. The study highlighted the urgent need for structured awareness promotion programs on DVT for the residents. Another cross-sectional survey was conducted among patients hospitalized at the King Abdulaziz Medical City, Riyadh, Saudi Arabia, which aimed to evaluate the patients' awareness of VTE and their perceptions of thromboprophylaxis<sup>7,8</sup>. The study found that awareness of DVT or PE was significantly higher among those with a personal or family history of the condition.

Overall, the study demonstrates lack of awareness of VTE, DVT, and PE among hospitalized patients. However, no such study has so far been undertaken in the context of the Aseer region of the Southern Saudi Arabia. The present study, therefore, undertakes to determine the awareness about the PE and DVT, their symptoms, risk factors and preventive measures among common people in the southern region of Aseer in Saudi Arabia.

## METHODS

In this cross-sectional study, data were collected by the purposely constructed questionnaire. A questionnaire composed of the demographic items and items related to PE, DVT and risk factors. A questionnaire was constructed after the series of discussions between the panel of experts this panel was composed of a subject specialist, researcher, language expert. Cronbach alpha of the questionnaire was calculated. The study was conducted in the Aseer region of Saudi Arabia.

After collection of data, data were coded and entered in the SPSS ver.20 software for analyses descriptive statistics (mean standard deviation, frequencies, and %s were computed), to measure the significance differences chi-square test was used at 5% level of significance. Ethical approval was obtained from King Khalid University, Saudi Arabia. The study duration was from July-2021 to October-2021.

## RESULTS

Total 801 respondents, respond the questionnaire. Out of 801 , 81.8% were belongs to Aseer region , while 18.2% belongs to the other regions. 64.8% were belongs to the 30–60 years age group, 31.3% were belongs to the age group of 18-30 years while under 18 were 2.4 and 1.5% were only above 60 , only 11.5% belongs to the health carriers, 48.4% were employed , 20.8% were students, 21.7% were un employed while 9% were retired, 97.% were belongs to high school,2.9% less than high school while .1 % have higher education (table -1)

**Table 1: Demographics**

<b>Are you from Aseer region?</b>		
	Frequency	Percent
Yes	655	81.8
No	146	18.2
<b>Age Category (years)</b>		
	Frequency	Percent
under 18	19	2.4
18-30	251	31.3
30-60	519	64.8
Above 60	12	1.5
<b>Health carrier?</b>		
	Frequency	Percent
Yes	92	11.5
No	709	88.5
<b>Occupation</b>		
	Frequency	Percent
Unemployed	174	21.7
Student	167	20.8
Employee	388	48.4
Retired	72	9.0
<b>Education Level</b>		
	Frequency	Percent
Less than high school	23	2.9
High school	777	97.0
Higher education	1	.1

Table 2. depicted that only 2.2% were having the personal history of DVT or PE, while 66.0% believed that the formation of a blood clot in a deep vein is DVT, while 23.3% believed that blockage in one of the pulmonary arteries in your lungs is DVT, and 10.6% believed that Twisted, enlarged of any of superficial veins is DVT (table 2)

**Table 2: Information about DVT**

<b>Personal History of DVT or PE</b>		
	Frequency	Percent
Yes	18	2.2
No	747	93.3
Unknown	36	4.5
Total	801	100.0
<b>What is DVT?</b>		
	Frequency	Percent
Blockage in one of the pulmonary arteries in your lungs	187	23.3
The formation of a blood clot in a deep vein	529	66.0
Twisted, enlarged of any of superficial veins	85	10.6
Total	801	100.0

Figure 1 depicted that 65% believed that Edema was a symptom, 62.% believed that Leg pain, 44.0% leg paralysis, 31.0% leg warm, 31.0% leg redness, 12.0% leg sweating, while 9.00 believed that leg bleeding was a symptoms (Figure 1).

As for risk factors, about 84.00% believed that long sitting, 60.0% believed that age, 46.0% believed that previous surgery, 32.0% opted smoking, 29.0% opted pregnancy while 2% opted vomiting and diarrhea as the risk factors for the conditions.

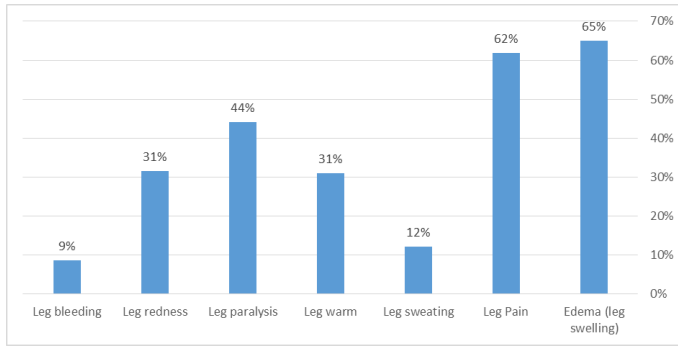


Figure 1: Symptoms

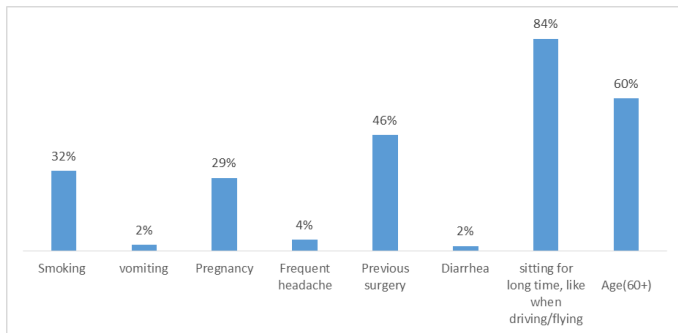


Figure 2: Risk Factors

As per (figure 2) 84.00% believed that long sitting , 60.0% believed that age , 46.0% believed that previous surgery , 32.0% opted smoking , 29.0% opted pregnancy while 2.00 opted vomiting and diarrhea were the risk factors.

Table 3: Preventive measures

Preventive measures	%
Walking	93%
weight loss	71%
Decrease glucose intake	47%
Drink more water	56%
Put legs in warm water	35%

As per table 3.00 93.0% opted walking as a preventive measure , while 71.% considering weight loss, 47.00% decrease Glucose level intake , 56.0% more water intake while 35% put legs in a warm water considered as a preventive measures (table 3).

Figure 3 depicted that 89.00% opted to go emergency department if he or someone in his family suffered from DVT.

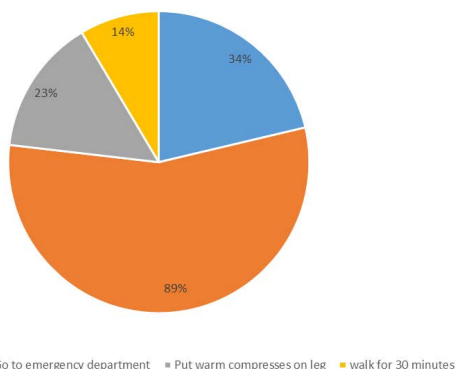


Figure 3: What would you do if you or someone of your family suffered from DVT

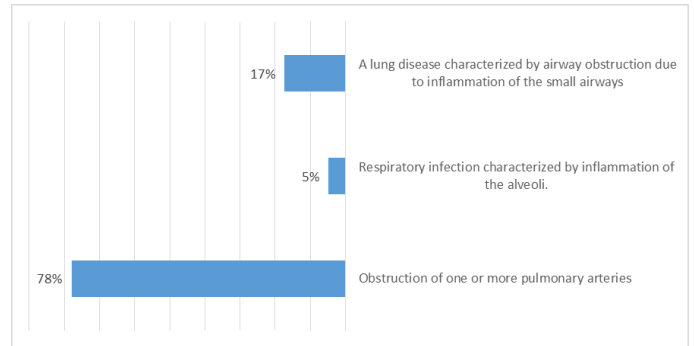


Figure 4: Pulmonary Embolism

Figure 4 depicted that 78.00% believed that pulmonary embolisms is Obstruction of one or more pulmonary arteries while 5.00 opted that Respiratory infection characterized by inflammation of the alveoli is embolism while 17.00% opted that A lung disease characterized by airway obstruction due to inflammation of the small airways is embolism

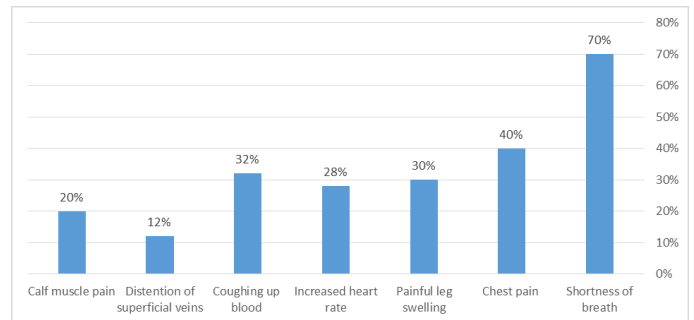


Figure 5: Signs/symptoms of pulmonary embolism

Figure 5 depicted that 70.0% considering shortness of breath is a symptom of PE, 40% considering chest pain, 32 % blood coughing, 30.0% painful swelling, 28.00% increased heart rate, 20.% Muscle pain, 12.00% distention of superficial veins.

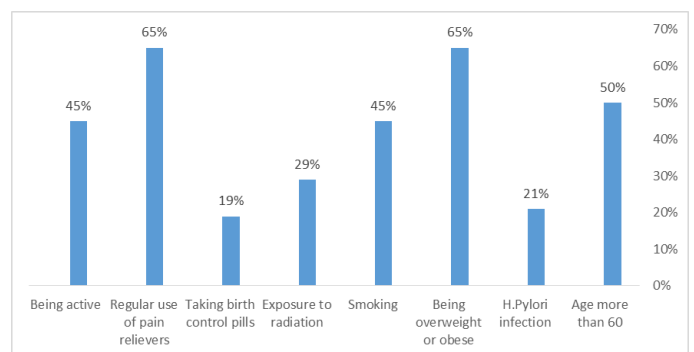


Figure 6: Risk factors for PE

As per figure 6, age above 60 (50%), overweight (65%), and regular use of pain relievers (65%) are the major risk factors for PE

As per figure 7 hearing problems (40%) , heart failure (35%) death of the part of a lung ( 39% and nerve damage (36%) were the major complication of PE.

As per figure 8 regular exercise (80%) stop smoking (75%) and weight reductions (65%) are the major preventive methods.

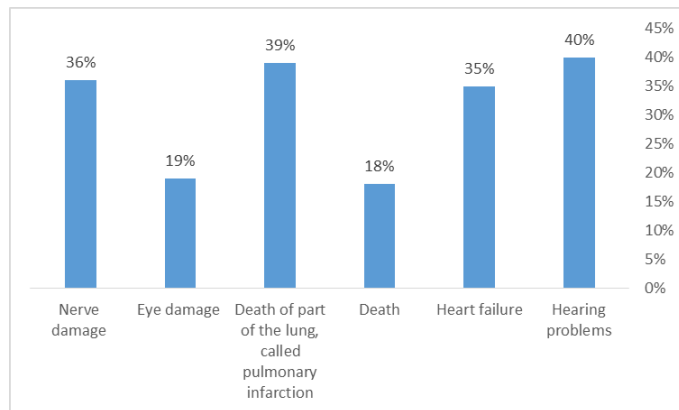


Figure 7: What complications may arise from Pulmonary embolism?

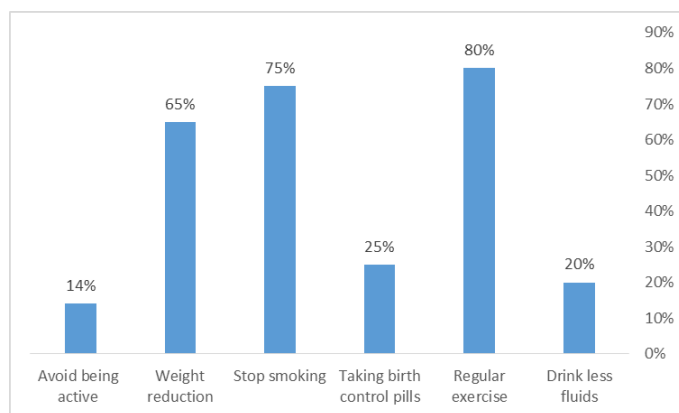


Figure 8: Preventive measures for pulmonary embolism

Table 4: Age Category (years) \* Personal History of DVT or PE

Count		Personal History of DVT or PE			Total
		Yes	No	Do not know	
Age Category (years)	under 18	1	18	0	19
	18-30	0	236	15	251
	30-60	16	482	21	519
	Above 60	1	11	0	12
Total		18	747	36	801

p=0.045

Table 04 depicted that we have observed significant differences while comparing age with personal history of DVT or PE.

## DISCUSSION

PE and DVT together is a major reason for morbidity and mortality globally. It also contributes to the financial burden on hospitals and a country’s healthcare budget. Therefore, public awareness is an important way not only prevent the disease but to lessen the burden in the hospitals. The present study gives an overview of people’s knowledge and awareness about the condition.

The sample size of 801 respondents, of which 655 (81.8%) are from Aseer region, is big enough to portray a reliable and valid picture of the population’s awareness of PE and DVT. Moreover, 96.9% respondents belong to the age group of 18-60 and 97% of them have at least high-school level of education. A huge majority (93.3%) of the participants

have no personal history of PE and DVT though, 18 of them have the experience of the disease.

The survey revealed that a significant portion of the population have wrong knowledge about DVT. A total of 187 (23.3%) participants believe that it is blockage in one of the pulmonary arteries in the lungs, whereas 85 of them (10.6%) think it is twisting and enlarging of any of the superficial veins. However, majority of them (529 or 66%) rightly believe it is the formation of a blood clot in a deep vein, which may simply be a guess work rather than real awareness, as the very name of the disease is “deep venous thrombosis.” These findings are consistent with the global awareness about thrombosis overall, and VTE in particular. The highest level of awareness of DVT was found in The United Kingdom (86%), while the lowest levels of awareness were in Japan (13%) and

The Netherlands (20%). Regarding awareness of pulmonary embolism, however, over three fourth (78%) of the respondents rightly defined it as obstruction of one or more pulmonary arteries.

Similarly, the survey showed flawed awareness of symptoms of DVT and its risk factors. About 44% consider leg paralysis as one of its symptoms, whereas 12% and 9% believe leg sweating and leg bleeding as the symptoms, respectively. Again, a good number of them also consider leg swelling and leg pain (65% & 62% respectively). As for risk factors, however, a good number of respondents showed a good understanding; about 84% believed that sitting for a long time is one of the reasons for the condition, whereas 60% believed that advancing age is a risk factor. The study also showed the respondents have a reasonably good knowledge about the preventive measures. Almost all of them (93%) think regular walking is a good way to prevent DVT. The participants have mixed knowledge about preventive measures for PE. Eighty percent of them consider regular exercise as one of the ways to prevent the disease.

## CONCLUSION

Finally, in this study we are looking for the prevalence of laser corneal refractive surgery laser vision correction LVC among medical students at King Khalid University who perform these procedures and to assess their level of satisfaction.

**Authorship Contribution:** All authors share equal effort contribution towards (1) substantial contributions to conception and design, acquisition, analysis and interpretation of data; (2) drafting the article and revising it critically for important intellectual content; and (3) final approval of the manuscript version to be published. Yes.

**Potential Conflict of Interest:** None

**Competing Interest:** None

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