

ORIGINAL ARTICLE

Occupational Determinants of Varicose Veins: Insights from a Cross-Sectional Study at a Tertiary Care Hospital in Islamabad

S H Waqar*, Mohiba Khaliq, Fahad Akhtar, Kanza Farrukh, Qaisar Mahmood, Fatima Shahzad

ABSTRACT**Objective:** To identify the occurrence varicose veins in relation to occupation.**Study Design:** Cross-sectional study.**Place and Duration of Study:** This study was conducted at the Department of General Surgery, Pakistan Institute of Medical Sciences (PIMS), Islamabad, Pakistan from January 2023 to December 2023.**Methods:** All adult patients of either gender who presented to the outpatient department with varicose veins were enrolled after taking consent by convenience sampling. Patients with chronic diseases like Diabetes Mellitus, Hypertension, Liver disease and Kidney disease were excluded from the study. The patient's demographic details, occupation, anthropometric measurements, smoking status, duration of symptoms, and other medical data were recorded. Data was collected on the proforma, and analysis was done using SPSS version 22.**Results:** There were eighty patients with an overall mean age of 38.62 ± 4.68 years (15-60 years). Among these, there were 38 (47.5%) males and 42 (52.5%) females. The majority of varicose vein patients were caused by standing or sitting for prolonged durations. The mean duration of standing or sitting per day and per week was 5.82 ± 3.64 hours and 55.6 ± 8.45 hours, respectively. It has been observed that varicose veins were significantly associated with age, family history, and standing/sitting time. The mean duration of symptoms was 20.3 ± 8.47 months or (1.667 ± 0.67) years).**Conclusion:** The study emphasized that certain occupational activities involving prolonged standing or sitting are associated with an increased risk of varicose veins. The findings suggest that occupational factors, such as prolonged periods of standing or sitting, play an essential role in the onset and progression of varicose veins.**Keywords:** Incidence, Occupation, Varicose Veins.**How to cite this:** Waqar SH, Khaliq M, Akhtar F, Farrukh K, Mahmood Q, Shahzad F. Occupational Determinants of Varicose Veins: Insights from a Cross-Sectional Study at a Tertiary Care Hospital in Islamabad. Life and Science. 2025; 6(4): 536-541. doi: <http://doi.org/10.37185/LnS.1.1.1026>

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Introduction

Varicose veins are twisted, enlarged veins that are typically blue or dark red in color and are usually found in the legs. They occur when the muscles are weak and the muscles are not functioning correctly.

Department of General Surgery

Pakistan Institute of Medical Sciences (PIMS), Islamabad,
Pakistan

Correspondence:

Dr. S H Waqar

Professor, General Surgery

Pakistan Institute of Medical Sciences (PIMS), Islamabad,
Pakistan

E-mail: waqardr@yahoo.com

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Valve dysfunction, arterial pressure, genetics, and mutations are significant causes of varicose veins. Visible muscle spasms, soreness or pain, swelling, and heaviness are symptoms of muscle weakness. Exercise, maintaining a healthy weight, and avoiding prolonged standing or sitting are possible treatments. Varicose veins can be a significant cause of severe lower extremity pain and other complications in patients. This condition may require surgery and other administrative measures, increasing healthcare costs and ultimately reducing employee productivity.^{1,2} Veins of the lower extremities have valves that prevent backflow of blood in these venous channels, so that blood always flows in one direction. When these valves become

incompetent, blood can pool in these veins, leading to their dilatation.³

Varicose veins (VV) are far more common in women than in men, with a prevalence of 25–55% in women and 10–30% in men.⁴ An earlier research in Saudi Arabia revealed that 48.2% of teachers have VV.⁵ The population density among nurses in Egypt is 18.2%.⁶ Over 23% of adults in Europe suffer from varicose veins, of which 80% are affected women, typically around age 40.⁷ Physical characteristics such as age, menstruation, pregnancy, and obesity are linked to a higher risk of VV in women than in men.⁸ Lower extremity weakness caused by varicose veins is a common condition that places a significant cost on society.⁹ While some individuals experience no symptoms or mild discomfort, some experience pain or discomfort, which can significantly affect their quality of life. Over time, varicose veins tighten and cause skin discoloration, fractures, superficial thrombophlebitis, hemorrhage, loss of skin tissue, lipodermatosclerosis, or vascular lesions. In addition to causing complications, varicose veins are a risk factor for blood vessel disease. Bleeding is dysfunctional, which can cause major psychological and physical issues and ultimately affect work efficiency.¹⁰

Age, sex, family history, obesity, diet, and postural factors are among the many risk factors for the development of varicose veins. Nowadays, women are more likely than men to have varicose veins.¹¹ Physical condition and work history are linked to the severity of varicose veins.¹² The physical demands of some occupations are considered important risk factors for the development of soft tissue. Work that requires prolonged sitting or standing can increase the prevalence and severity of muscle weakness. However, very few studies in Pakistan have investigated the risk factors for varicose veins as an occupational disease. This study aimed to identify the relationship between varicose veins and occupation.

Methods

This observational cross-sectional study investigated 80 patients with varicose veins from different occupations at the General Surgery Department of Pakistan Institute of Medical Sciences (PIMS), Islamabad from January 2023 to December 2023 after taking approval from FMTI Ethical Research

Review Board of PIMS vide letter no: FMTI ERRB/06/15, dated: 15th March 2022. All adult patients of either gender who presented to the outpatient department were enrolled after taking informed consent by convenient sampling using the WHO formula for calculating sample size. The study's detailed objectives and procedures were explained to the patients, and consent forms were obtained from them before proceeding with the examination and data collection. Patients were evaluated for multiple symptoms associated with varicose veins, including those from various occupations with a history of prolonged standing. Patients with chronic diseases such as diabetes mellitus (DM), hypertension (HTN), cardiovascular disease, liver disease, and kidney disease were excluded. A detailed questionnaire used for data collection and entails the following questions: (i) What is your occupation? (ii) When did you first feel the appearance of a dilated lower limb vein? (iii) What is the nature of your job (standing/sitting/walking)? (iv) What was your duration of employment? (v) Your working hours per day? (vi) Your working hours per week? (vii) What is the total duration of your symptoms? The patient's demographic details, anthropometric measurements, smoking status, duration of symptoms, and other medical data were recorded.

Data analysis was done using SPSS version 22. Mean and standard deviation were used to express the numerical variables such as age, body mass index, and duration of symptoms. Categorical variables such as age group, gender, family history, smoking status, and symptoms were presented as frequency and percentages.

Results

The overall mean age was 38.62 ± 4.68 years (15–60 years). Among 80 cases, there were 38 (47.5%) male. The majority of varicose vein patients were caused by standing or sitting for prolonged durations. The mean duration of standing or sitting per day and per week was 5.82 ± 3.64 hours and 55.6 ± 8.45 hours, respectively. It has been observed that varicose veins were significantly associated with age, family history, and standing/sitting time. The mean duration of symptoms was 20.3 ± 8.47 months or (1.67 ± 0.67) years). Demographic details and baseline characteristics shown in Table 1.

Table 1: Demographic details of patients (N=80)	
Variables	Value N (%)
Age (years)	40.18±4.93
Gender	
Male	38 (47.5%)
Female	42 (52.5%)
BMI (kg/m ²)	
<25	25.88±4.47
25.0 to 29.9	26.39±3.87
30.0 to 34.9	27.21±4.56
≥35	27.68±3.54
Risk Factors	
Family History	20 (25%)
Obesity	26 (32.5%)
Smoking	12 (15%)
Number of Pregnancies	
Never been pregnant	13 (16.25%)
Once	09 (11.25%)
Two or more	20 (25%)
Mean duration of Standing/sitting	
Per day	5.82±3.64
Per week	55.6±8.45
Duration of Employment	10.8±2.88
Working hours per day	
<8 hours	56 (70%)
>8 hours	24 (30%)
Duration of Symptoms (years)	1.67±0.67 years
Limb affected	
Right	32 (40%)
Left	24 (30%)
Both	24 (30%)

Figure.1 illustrates the different age groups of patients of Varicose Veins in relation to different occupations illustrated in Figure.2.

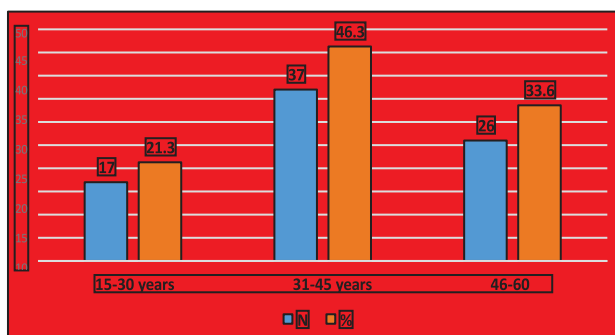


Fig.1: Age groups (N=80)

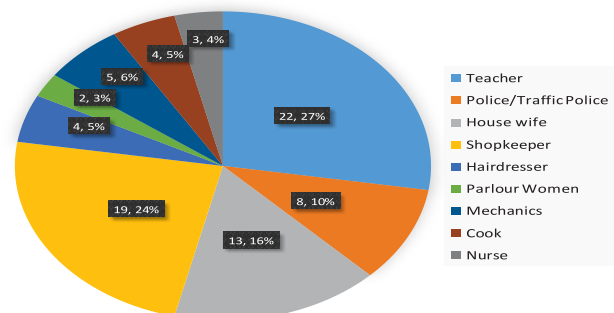


Fig.2: Varicose veins in relation to occupations (N=80)

Discussion

The present study mainly focused on the association of varicose veins (VV) with different occupations

among 80 cases and reported that teachers and shopkeepers suffered the most from the illness. Additionally, varicose veins were significantly associated with age, family history, blood pressure and standing time. Different occupations that entail prolonged standing, walking, and sitting are more prone to varicose veins. Varicose veins are sometimes viewed as a cosmetic issue until they cause pain and discomfort. However, they are a major concern for patients with acute pain and associated complications. Varicose veins can also cause other bleeding-related problems.¹³ Treatment options vary depending on the severity of the condition, the age of the patient, and the amount of physical activity. Treatment ranges from self-care strategies aimed at managing symptoms to more invasive surgery to contain or remove tissue damage. The variation in prevalence of VV indicates that people's lifestyles may be one reason. An earlier study reported that prevalence of VV was 19%.¹⁴ The prevalence of varicose veins in adults in Saudi Arabia was 14%.¹⁵ In contrast, the prevalence is 13.5% in Finland, 15% in the US. and 36.7% in Turkey.¹⁶⁻¹⁸ The previous study revealed that the prevalence of varicose veins among female nurses was found to be 65.3%.¹⁹ Another study reported a 73.9% prevalence among nurses, with 78% of female nurses affected.⁴ Earlier study showed that higher body mass index (BMI) was significantly associated with increased lean muscle mass. Many studies showed that obesity and weight gain were well- established risk factors for developing varicose veins.^{4,20,21} An Egyptian study found a significant association between weight gain and the risk and severity of lower limb fibrosis but many of these studies have used a single variable or did not consider important risk factors such as age in their models.²²

Epidemiological studies have shown that patients with abdominal obesity have increased venous insufficiency (CVI) and decreased venous thromboembolism (VTE).²³ Central weight gain, which creates greater abdominal pressure, is particularly associated with a higher prevalence of varicose veins. This is consistent with the findings of the present study, which showed a higher progression of fibrosis in patients with higher BMI. In addition, intra-abdominal pressure was higher in overweight patients, which accounts for

revascularization.²⁴

In addition to age and gender, smoking is another important factor associated with vascular dysfunction in all age groups.²⁵ Evidence suggests that smoking is associated with the development of vascular thrombosis.²⁶ One study showed that epidemiological studies reveal an association between smoking and atherosclerosis in adults.

Prolonged standing is an established, modifiable occupational risk factor for varicose veins. Jobs that require long hours of standing are a known risk factor for developing or worsening this condition. Earlier study observed that 50 of 273 traffic police officers (18.3%) reported muscle spasms.²⁷ In contrast, in another study, the numbers were much lower, with only 4.17% of traffic police officers having muscle spasms in their legs and 2.91% in their hands while reporting a high degree of extension.²⁸ The reason for the study can be attributed to the long hours that traffic police officers have to endure. This study also showed that varicose veins are more common among teachers, traffic policemen, house wives and shopkeepers who has prolonged standing.

A study of 203 nurses, using a questionnaire and physical examination based on CEAP criteria, found evidence of varicose veins (VV) in 145 nurses (71.4%). The percentage suggests that long working hours per task may lead to the development of varicose veins, irrespective of gender.²⁹

This study has several limitations that should be acknowledged. Being a cross-sectional study, it can only demonstrate associations between occupational factors and varicose veins rather than establish a causal relationship. The use of convenience sampling and data collection from a single tertiary care hospital may limit the generalizability of the findings to the broader population. Additionally, the study relied on self-reported occupational information such as the duration of standing or sitting, which may introduce recall bias and affect accuracy. Although certain chronic diseases were excluded, potential confounding factors such as genetic predisposition, body mass index, and hormonal influences were not fully controlled, which could have influenced the observed outcomes. Furthermore, the relatively small sample size and absence of objective measurements of occupational exposure may

reduce the statistical power and precision of the results. Future studies with larger, multicentric samples and longitudinal designs using objective measurement tools are recommended to validate and extend these findings.

Future research should focus on multicenter studies with larger, more diverse populations to enhance the generalizability of the findings. Longitudinal or cohort designs are recommended to establish better causal relationships between occupational factors and the development or progression of varicose veins. The inclusion of objective measurement tools—such as activity trackers, workplace ergonomic assessments, or digital occupational monitoring—would provide more accurate data on standing and sitting durations. Further studies should also explore the role of additional risk factors, including body mass index, hormonal variations, lifestyle habits, and genetic predisposition, to better understand the multifactorial nature of varicose veins. Moreover, intervention-based studies evaluating workplace modifications, periodic rest breaks, and preventive strategies can help formulate evidence-based guidelines to reduce occupational risk and improve vascular health among workers.

Conclusion

The study emphasized that certain occupational activities that involve standing or sitting for long periods are associated with an increased risk of varicose veins, such as in teachers (27%), traffic policemen (10%), housewives (16%), and shopkeepers (24%) who have prolonged standing. The findings suggest that occupational factors, such as prolonged periods of standing or sitting, play an essential role in the onset and progression of varicose veins. To reduce the risk of developing varicose veins, individuals who work long hours are advised to take periodic sitting or walking breaks.

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Author Contributions

SHQ: Conception and design of the work

MK: Manuscript writing for methodology design and investigation

FA: Data acquisition, curation, and statistical analysis

KF: Validation of data, interpretation, and write-up of results

QM: Revising, editing, and supervising for intellectual content

FS: Writing the original draft, proofreading, and approval for final submission