RISK ASSESSMENT OF CHRONIC VENOUS INSUFFICIENCY AND VARICOSE VEINS AMONG TEACHERS: PREVALENCE, PATTERNS, AND PERSPECTIVES IN SAHIWAL DIVISION, PAKISTAN

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ABSTRACT

Background: The prevalence of varicose veins in the legs is commonly observed across the global population. However, the specific prevalence of varicose veins and the associated risk factors within the Sahiwal division are not clearly known. **Objective:** This study aimed at clarifying the risk factors for varicose veins among teachers in Sahiwal division. This study's objective was to evaluate the risk of varicose veins among teachers Sahiwal division, Pakistan. **Methodology:** Distributions of frequency and percentage were used to summarize the data. The t-test and chi-square test were used to assess statistical significance. This cross-sectional survey was carried out during February to April 2025 among teachers of both genders working in Sahiwal division's Primary, elementary, and high schools. **Results:** Mean age of both gender were 42.2 ± 2.06 years, 306 (51%) of the 600 participating instructors were male, while the remaining teachers were female. Pain in the legs increase especially during work (20.5%). The majority of participants (31.0%) had been employed for more than 15 years, and (41.0%) had been standing for fewer than five hours each day. Spider leg-shaped veins were the most noticeable symptom (24.2%). Swelling in the leg or ankle, was the common indicator (40.5%). 179 instructors in all had a family history of varicose veins; 84 of them (14.0%) had already received a varicose vein diagnosis. **Conclusion:** Obesity, family history, more than five hours standing is associated risk factor of chronic venous insufficiency and varicose veins among teachers that are above 45 years old. In summary, female educators who have a family history of varicose veins are at a higher risk of chronic venous insufficiency and varicose veins disease. Teachers in the Sahiwal division have a significant prevalence of varicose veins. This study indicates that teachers are far more likely to develop the disorder because of the way they work, which accelerates the condition's advancement.

INTRODUCTION

The healthcare professionals frequently ignore chronic venous disease (CVD) because to a lack of understanding of the scope and severity of the issue, as well as an insufficient understanding of the different ways that primary and secondary venous illnesses show.[1] The number of people affected by CVD and the socioeconomic effects of its more severe symptoms are connected to the disease's

importance. The venous system of the lower extremities is affected by a disorder known as chronic venous insufficiency (CVI) which leads towards varicose vein problem.[2] The World Health Organization (WHO) describes varicose veins as long, dilated, and tortuous veins that typically appear in the legs. They may result in pain, discomfort, edema, heaviness, and occasionally problems such as blood clots or ulceration.[3] Though they are frequently seen as a cosmetic issue, they can also be an indication of underlying venous insufficiency, a condition in which the valves of veins are incompetent, causing blood to pool and internal pressure to rise. In the adult population, the estimated prevalence of varicose veins ranges from 5% to 30%. The male to female ratio is 3:1, while a more recent study suggests that the male prevalence may be higher.[4]

The Framingham Study provides an estimate of the growth rate of varicose veins, reporting a yearly incidence of 1.9% for men and 2.6% for women.[5-8] Varicose veins are more common in advanced, developed nations than in developing nations. Age, sex, obesity, pregnancy, a family history of varicose veins, phlebitis, and a history of leg injuries are risk factors that have been linked to CVI.[3] Varicose veins affect between 10% and 60% of people worldwide. As opposed to up to 30% in the West, this prevalence is higher in the Asian region.[9] The research study indicates that up to 62% of Saudi Arabians are affected, with a yearly increase in frequency of roughly 5% for women and 2% for men.[10]

According to a Mangalore study, 170 patients with varicose veins were admitted to tertiary medical facilities between May 2011 and April 2014.The age range of 41 to 50 years old accounted for the majority of cases (31.2%). There were 127 men (74.7%) and 101 unskilled workers (59.4%) in the majority. In 123 cases (72.4%), superficial veins were implicated.[11] The studies [11-14] also suggested that teachers had a 37.8% frequency of varicose veins, with a higher prevalence in female teachers. One possible cause of varicose veins in teachers could be long standing and insufficient sitting intervals.[13] in their study suggested that foam Sclerotherapy for chronic venous ulcers administered under ultrasound guidance has been linked to a high rate of healing and a low risk of recurrence.

The study based on the patients in Pakistan was conducted by[15] in surgical ward of the Mayo Hospital, Lahore. Most of the patients in our study were men; the male to female ratio for those with varicose veins was 3:1, and the majority of the men had either class 2 or class 5.

The p-value for the class of varicose veins and gender was 0.25, indicating that there was no significant association between the two variables. In their study they concluded that male patients in their study group had greater suffering than female patients. The incidence rate was similar for individuals of all ages. Our motivation to investigate the etiology of varicose veins came from the study of[16-18] Further investigation into the risk factors associated with female gender and career is necessary. In addition, we

now have more patients with varicose vein issues from Lahore, Rawalpindi, and Multan. We also collect data from people who have particular skin diseases and are dealing with varicose ulcers.

This study uses a multifaceted method that incorporates qualitative interviews, epidemiological data, and cultural assessments in order to provide a comprehensive picture of varicose vein. The ultimate goal of this research project is to improve the general health and quality of life for people in Punjab and beyond by providing evidence-based techniques for the prevention, diagnosis, and management of varicose.

Material and Methods

Study design: Observational, cross-sectional, and quantitative research design based on primary data collected through a face-to-face of the adult teacher's population

Setting: Sahiwal division

Duration: February to April of 2025

Sampling technique: study was carried out at 32 randomly chosen schools between (primary level 10, middle level 8, and High level 14)

Sample size: A total of 610 school instructors were selected to participate in the study. The participants included 310 men and 300 women.

Sample selection criteria

- **Inclusion criteria**

  Male and female instructors working in Sahiwal division, teaching any level age 25-59 years old.

- **Exclusion criteria**

Teachers who have taught for less than three years.

Data collection procedure

The study was started after approval from approval of Ethical committee of the Government College University's Research and Ethics Committee GCU-IIB-471]. Informed consent was obtained from all subjects involved in the study. The participants were given the questionnaire in person along with a leg examination. After gaining their consent, 610 school instructors in all were chosen for the study. Every participant received an explanation of the study's purpose. They had all of their questions and concerns answered before the questionnaire was given out. Six hundred and 610 subjects (310 men and 300 women) aged between 25-59 years were recruited. After excluding 10 subjects due to missing data, we analyzed the data of 600 participants (306 men and 294 women). This cross-sectional study was designed to examine the determinants of VV. The authors constructed a structured questionnaire based on the available literature regarding attitudes, perceptions, and behaviors for varicose veins; the questionnaire was divided into three parts:

Participants' age, gender, height, weight, and other personal and demographic data were gathered in the first section. The second section collected information about the workplace, such as employment responsibilities and length of service. Information about varicose veins, including symptoms and results from a physical examination of the legs, was covered in the third section.

Participants completed the questionnaire during in-person sessions. Following each completion, researchers probed their comprehension of the survey items to evaluate the instrument's face validity. After completing the questionnaire, the participants were also asked which questions they found unclear and the reasons for their confusion. Feedback from this pretesting phase was used to update and refine the questionnaire. The actual data collection was then carried out during February to April 2025 by three interviewers who were trained in face-to-face survey methodology. These interviewers used the updated questionnaire to conduct the interviews. Since the survey participants were volunteers recruited during the sampling stage, a total of 610 adults ultimately took part in the survey. This represented a very high response rate of 98%

Measurement of risk factors

The study evaluated several known risk factors for varicose veins, including sex, age, body mass index (BMI), family history, smoking, and prolonged upright standing posture at work. Through the questionnaire, the participants were asked about the number of hours they spent standing during their workday, as well as their occupation. Based on the duration of standing, the jobs were categorized into two groups: those where workers stood for 6 or more hours per day, and those where workers stood for less than 5 hours per day (with 5 hours being the median standing duration). Using these job categories, the study subjects were then divided into three groups based on their working conditions:

- Subjects who stood upright for prolonged periods (5 or more hours) without substantial movement.
- Subjects who stood for prolonged periods (5 or more hours) with substantial movement.
- Subjects who did not stand for prolonged periods (less than 5 hours).

This categorization allowed the researchers to assess the potential association between prolonged standing posture and the risk of developing varicose veins.

Statistical analysis

Distributions of frequency and percentage were used to summarize the data. The t-test and chi-square test were used to assess statistical significance. A multivariate logistic regression analysis was carried out to look more closely at the relationships. This made it possible to calculate odds ratios along with 95% CI. The p-value was deemed statistically significant if it was less than 0.05. The data was extracted, edited,

coded, and then imported into IBM SPSS Statistics version 29.0 for Windows[19] Teachers' body mass index (BMI), years of teaching experience, teaching grade, standing hours, and demographics were all included in the descriptive analysis. Additionally, data was compiled on instructors' smoking habits, medical history, and family history of varicose veins. The association and distribution of varicose vein symptoms along with years of teaching experience and standing hours were evaluated using cross-tabulation. This made it easier to determine the teachers' risk factors for varicose veins.

Results

Table-1demonstrates that 600 teachers who met the inclusion criteria in total filled out the survey questionnaire. The average age of teachers was 42.2 ± 2.06 years old, with a range of 25 to 59 years. Of these, 185 (30.8%) were primary school instructors, 212 (53.3%) were middle or intermediate school teachers, and 203 (33.8%) were high school teachers. 294 (49.0%) of the teachers were female, while 306 (51.0%) were male. In terms of years spent teaching, 103 (17.2%) had been teaching for three to six years, 137 (22.8%) for seven to ten years, 174 (20.0%) for eleven to fourteen years, and 186 (31.0%) for fifteen years and beyond. 354 people (59.0%) stood for six or more hours a day, compared to 246 people (41.0%) who stood for five hours or less. An exact of 253 (42.2%) were overweight and 182 (30.3%) were overweight. **Table 2** represents the medical and family history of varicose veins among teachers in Sahiwal division, Pakistan. A total of 179 (29.8%) teachers had a family history of varicose veins, 209 (34.8%) were diagnosed with varicose veins previously and 163 of teachers (27.2%) were smokers. **Table 3** shows that participants' reported symptoms of varicose veins include leg pain, which is more common during work (20.5%), leg cramps at night (18.5%), a heaviness in the legs (22.2), leg pain that is only relieved by medication (17.8%), and itching around the veins in the legs (28.5%). Total of (31.2%) teachers did not exhibit any indications of varicose veins. **Table 4** displays the indications of varicose veins found during the clinical evaluation of Sahiwal Division teachers. Spider leg-shaped veins were the most common sign (15.0%), followed by leg vein swelling and limp (28.3%), leg scar (21.7%), and change in leg skin color (35.2%). Other signs included eczema or rash on the legs (27.8%), leg or ankle swelling (40.5%), and pain when touching the leg veins (31.7%).

Table 5 shows that the most commonly reported sign/symptom among teachers who stood for less than 5 hours per day was pain in the legs, especially during work, occurring in 32.1% of this group. This was found to be statistically significant.

In comparison, the most prevalent signs/symptoms among teachers who stood for 6 or more hours per day were swelling and visible varicose veins in the legs, reported by 22.9% and 22% of this group respectively. These findings were also statistically significant.

In summary, the distribution of varicose vein signs and symptoms differed based on the duration of standing during work. Teachers who stood for shorter durations (<5 hours) were more likely to experience leg pain, while those who stood for longer periods (≥6 hours) more commonly reported swelling and visible varicose veins in the legs. These differences were statistically significant. **Table 6** revealed several factors that were associated with the prevalence of varicose veins among the teachers, varicose veins were diagnosed in 23% of female teachers, compared to 14.8% of male teachers. This difference was statistically significant (p=0.037). Years of teaching experience: 24.5% of teachers who had been teaching for 12-15 years were diagnosed with varicose veins. This was significantly higher than the 8.8% rate observed among those who had been teaching for 4-7 years (p=0.048). Family history: 31.4% of teachers with a family history of varicose veins were found to have the condition themselves. This was substantially higher than the 11.6% rate among those without a family history. In summary, female sex, longer teaching experience, and a family history were identified as factors significantly associated with a higher prevalence of varicose veins among the teachers in the study.

Table 7 shows our research finding, in the older group (≥45 years old), having a family history of VV was a risk factor; however, in the younger group (<45 years old), the effect was not statistically significant. In the older group, we observe that a significant risk factor for lower limb VV is having a family history. According to our research, the older group's(≥45 years old) prolonged standing at work did not have a statistically significant effect until they were standing for more than five hours every day. Standing for longer than five hours a day was similarly linked to an increased risk in the older group (OR = 2.31).

Table-1: Participant personal information

Personal Info.	Frequency	Percentages %
Grade		
Primary	185	30.8%
Middle	212	53.3%
High	203	33.8%
Age in Years		
25-34	74	12.3%
35-44	79	29.8%
45-54	182	30.3%
55 and above	265	44.2%
Gender		
Male	306	51.0%
Female	294	49.0%
Teaching Years		
3-6 years	103	17.2%
7-10	137	22.8%

11-14	174	29.0%
15 and above	186	31.0%
Standing Hours		
Less or equal than 5	246	41.0%
Greater or equal than	354	59.0%
Body Mass Index		
Normal	165	27.5%
Overweight	253	42.2%
Obese	182	30.3%

Table-2: Varicose veins in the participants' medical and family histories

Information	Frequency	Percentage %
Diagnosed with VV		
No	391	65.2%
Yes	209	34.8%
Smoking		
No	437	72.8%
Yes	163	27.2%
Family History of VV		
No	421	70.2%
Yes	179	29.8%

Table-3:Participants' reported varicose vein symptoms

Symptoms	Frequency	Percentage %
Leg pain that is only treated with medication	107	17.8%
Itching around the vein in the legs	171	28.5%
Heat or itching around the legs	89	14.8%
A feeling of heaviness in the legs	135	22.5%
Legs cramps at night	111	18.5%
Pain in the legs increase especially during work	123	20.5%
None of these	187	31.2%

Table-4: Clinical examination findings for varicose veins in the participants

Clinical analysis	Frequency	Percentage %
Leg Ulcer	130	21.7 %
Leg Scar	105	17.5 %
Swelling and limp in legs vein	170	28.3 %
Spider legs shaped veins	145	24.2 %
Change in the leg skin color	211	35.2 %
Swelling in the leg or ankle	243	40.5 %

Pain when touching the leg vein	190	31.7 %
No Signs Detected	213	35.5 %
Eczema or rash	167	27.8 %

Table-5: Information about standing hours and varicose vein symptoms

Teachers Standing Hours in a day					
Assessment	≤ 5 Hours	%	> 6 Hours	%	P Value
No signs detected	137	22.8%	107	17.8%	0.001
Leg pain that only goes away by taking pain killers	110	18.3%	124	20.7%	<0.001
A feeling of heaviness in legs	93	15.5%	155	25.8%	0.014
Legs Cramps at night	140	23.3%	189	31.5%	0.052
Pain in the legs increases especially during work	193	32.1%	210	35%	0.001
Symptoms of VV teachers had	56	9.3%	71	11.8%	0.045
Eczema or rash on the legs	121	20.7%	187	31.2%	0.014
Leg Ulcers	103	17.1%	201	33.5%	0.002
Swelling in the legs or ankle	147	24.5%	233	38.8%	0.087
Pain when touching the legs vein	151	25.1%	245	40.8%	0.061
Change in the leg skin	122	20.3s%	213	35.5%	0.004
None of these	170	28.3%	101	16.8%	0.004

Table 6: Varicose vein-related factors among the subjects

varicose veins Diagnostic					
Varicose Vein associated Factors	No	%	Yes	%	P Value
Age In years					
25-34 years	21	3.5%	0	0%	0.021
35-44 years	34	5.6%	23	3.8%	
45-54 years	198	33.0%	45	7.5%	
55 and above	211	35.1%	68	11.3%	
Gender					
Male	219	36.5%	87	14.5%	0.045
Female	245	40.8%	49	8.1%	
Teaching in years					

3-6 years	35	5.8%	14	2.3%	0.077
7-10 years	177	29.5%	29	4.8%	
11-14 years	128	21.3%	33	5.5%	
15 and above years	124	20.6%	60	10.0%	
Standing Hours					
Less than or equal to 5	174	29.0%	19	3.1%	0.004
Greater than 6	290	48.3%	117	19.5%	
Body Mass Index					
Normal	74	12.3%	14	2.3%	0.007
Overweight	157	26.1%	55	9.1%	
Obese	233	38.8%	67	11.2%	
Family History					
Yes	132	22.0%	48	8.0%	0.014
No	332	55.3%	88	14.7%	
Smoking					
Yes	274	45.6%	55	9.17%	0.001
No	190	31.6%	81	13.5%	

Table7: Multivariate logistic regression among the factors of subjects related VV

Factors	Frequency	Odd Ratio	95% Confidence I	P value
Daily Standing Hours				
Less than or equa	174	1.02	0.8-11.6	0.459
Greater than 6	290	2.31	1.6-9.3	0.018
Teaching in Years				
3-6 years	35	7.4	4.3-18.1	0.237
7-10 years	177	6.3	2.7-19.2	0.411
11-14 years	128	11.9	5.4-23.7	0.013
15 and above yea	124	9.6	6.1-23.5	0.021
Age in years				
25-34 years	21	9.1	3.2-21.8	0.681
35-44 years	34	11.7	6.7-28.8	0.237

45-54 years	198	8.2	2.3-24.5	0.002
55 and above	211	7.6	2.7-19.8	0.007
Gender				
Male	219	10.9	5.4-26.3	0.074
Female	245	12.0	6.1-29.5	0.032
Family History				
Yes	132	1.8	0.2-8.4	0.001
No	332	5.3	1.8-13.7	0.089
Body Mass Index				
Normal	74	2.8	0.4-10.7	0.187
Overweight	157	4.3	1.9-17.5	0.041
Obese	233	5.9	2.4-21.6	0.002

DISCUSSION

The prevalence of varicose veins, a prominent sign of vascular problems, is rising as a result of a number of factors, including age, sex, and extended standing. In this study, instructors from several schools in the Sahiwal division were asked to rate their risk of varicose veins. The study employed a cross-sectional design with questionnaires. The results showed that 30.3% of the participants were in the 45-54 age group, representing a relatively older population. In terms of gender, 51.0% were male and 49.0% were female. The majority of the participants (>15 years) had extensive teaching experience. Additionally, more than three-fourths of the teachers had a high body mass index (BMI). Previous diagnosis of varicose veins was reported by 18.5% of the participants. However, the study found a higher prevalence of varicose veins among teachers in the Sahiwal division compared to previous reports. This difference might be attributed to lifestyle and environmental factors that vary between different cities.

The study found that among the 21 teachers aged 25-34 years, none had been previously diagnosed with varicose veins (VV). In contrast, out of the 265 teachers aged 55 years and above who participated in the study, 211 (35.1%) were diagnosed with VV. The prevalence of VV diagnosis was slightly lower (33.0%) among the 45-54 age group, but the total number of teachers in the older age groups (45 years and above) was the highest in the study population. These findings align with the understanding that older age is a well-established risk factor for developing venous diseases. As individuals age, the calf muscles weaken, leading to increased pressure on the superficial veins. Additionally, the gradual deterioration of the vessel walls over time contributes to the higher prevalence of venous disorders in the elderly.[12] Supporting this,

a previous study in the United States found that the prevalence of VV was less than 1% in men and less than 10% in women younger than 30 years of age.[13]

Regarding the diagnosis of VV, there was a substantial difference in the current study between male and female professors. The proportion of male teachers with a diagnosis was 36.5%, while the for female teachers was 40.8%. In the study, female gender was thought to be a risk factor for VV.[13] According to multiple earlier researches, women are more likely than men to acquire VV.[14, 15] Pregnancy is a significant factor that raises the frequency of VV in women.[16]

The majority of teachers (124) had more than 15 years of teaching experience.20.6% of these long-serving teachers were diagnosed with varicose veins (VV). In contrast, only 5.8% of teachers with 3-6 years of experience were diagnosed with VV, the lowest percentage. However, the overall relationship between teaching years and VV diagnosis was not statistically significant. 48.3% of teachers who stood for more than 6 hours per day were diagnosed with VV. This was significantly higher than the 29% VV prevalence among those who stood for less than 6 hours per day.55.3% of teachers with a family history of VV were themselves diagnosed with the condition. This was substantially higher than the 22% VV rate among those without a family history Family history is an established risk factor for venous diseases, though the specific genetic links are not yet fully identified. The study found a statistically significant association between high body mass index (BMI) and the diagnosis of VV among the teachers.

In summary, while teaching experience did not show a significant link, other factors like prolonged standing, family history, and high BMI were identified as important risk factors for varicose veins in this population of teachers. The study did not include every school in the Sahiwal division, so the findings may not be fully representative of all teachers in the region. The measurement of standing hours and weight was based on self-reporting by the participants, which could lead to over- or underestimation of these factors. The participants did not undergo Doppler ultrasound examinations, which is an important objective method to diagnose vascular conditions like varicose veins.

CONCLUSION

Varicose veins are a common condition, with a higher prevalence observed in females compared to males. Teachers, who spend extensive hours standing during their work, are particularly vulnerable to developing this condition. these findings, further actions are needed to address this issue. Increase education and awareness among teachers about varicose veins through mass media campaigns and targeted outreach. Conduct additional research studies to gain a deeper understanding of the prevalence

and risk factors for varicose veins in the teaching profession. Explore interventions and preventive measures that can be implemented to reduce the incidence and complications of varicose veins among teachers. By taking these steps, the goal should be to decrease the burden of varicose veins and improve the overall health and well-being of teachers in the Sahiwal division and beyond.

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