Prevalence and Awareness of Varicose Veins (VV) among Teachers and the General Population of Taif City, Saudi Arabia

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Abstract

Background: The prevalence of Varicose Veins (VV) varies among individuals in different occupations with high prevalence reported among teachers due to long standing periods. Besides standing for long periods, several risk factors of VV were mentioned in the literature but with discordance between the studies about the significance of some of these factors. The research on the general population and teachers' awareness of VV, is limited in Taif city, Saudi Arabia.

Aim: This study aimed to investigate the prevalence and awareness of VV among teachers and the general population of Taif city and find out the correlation and differences between teachers and other Taif residents with VV along with socio-demographic characteristics.

Methods: A cross-sectional web-based study was conducted in Taif, Saudi Arabia. A self-administered questionnaire was used to collect the participants' socio-demographic characteristics, employment status, medical history, awareness, and knowledge about VV. SPSS was used to analyze the results. Chi-square test and unpaired t-test at a 0.05 level of significance were used to assess the association of different factors and the participant's diagnosis with VV.

Results: A total of 1,754 individuals (993 females) participated in the study. The most frequent age groups were 25-29 years (22.6%) and 40-44 years (20.5%). Most participants (85.6%) had a university degree or higher. More than half of the participants (58.4%) were in the education field. The prevalence of VV among all participants was 10% and 13.1% among the teachers. The Chi-square test indicated that the significant risk factors of VV among the participants were being a female ($p<0.001$), older age ($p<0.001$), lower educational level ($p<0.001$), smoking ($p<0.001$), lower exercise level ($p<0.001$), long duration of standing at work ($p=0.002$), being a teacher ($p<0.001$), having received prior hormonal treatment ($p=0.002$), family history with VV ($p<0.001$), longer duration of household chores ($p<0.001$), and being at menopause ($p<0.001$). Unpaired t-test results indicated that those with higher BMI, number of pregnancies, and number of children had a significantly higher prevalence of VV.
Conclusion: The prevalence of VV in the current study is comparable to previous studies. Many significant modifiable VV risk factors were identified. The participants' awareness and knowledge about VV causes, symptoms, and prophylactic measures were not adequate in some aspects. Increasing the general population's awareness about VV using simple methods is warranted in an attempt to reduce the prevalence of VV and its complications.

Keywords: Varicose veins, teachers, Saudi Arabia

Introduction

Varicose veins (VV) or varices are defined as palpable, distended, often with tortuosity of subcutaneous veins for more than three millimeters in diameter (computed in an upright posture), which present mainly in the lower limb including great saphenous and small saphenous veins, tributaries of saphenous, and other superficial leg veins(1). Advanced age, female sex, pregnancy, family history of VV, chronic constipation, increased height, obesity, deep vein thrombosis, arteriovenous shunting, and congenital valvular dysfunction are considered risk factors for VV(1–3). In addition, occupation-related factors were mentioned in several studies including standing for long hours and heavy lifting (4,5).

Patients with VV are often asymptomatic. Despite that, VV can cause various symptoms, including swelling, aching, throbbing, leg fatigue, and night cramps, but the cosmetic issue remains the main concern of the patient.(6,7). At the global level, several studies have estimated the prevalence of VV. In the United States, VV disease occurred in 23% of adults with a higher incidence in women(2,3). Another study done in Brazil showed the VV prevalence was 47.6% (8). Another Russian study reported the VV prevalence as 29% among the population (9). Locally, a study was performed in Riyadh city that calculated the VV prevalence as 47.6% among female adults(10). Also, a study on school teachers in Abha showed the VV prevalence to be 42%, with a high prevalence among females , while 5% of VV patients were unaware of their illness(11).

In the Kingdom of Saudi Arabia (KSA), several studies have estimated the prevalence of VV and the awareness of this illness, but most of this research was directed to selected populations. In addition, no study compared the prevalence of VV between the general population and school teachers who are considered at a high-risk occupation to develop VV(11–13). Moreover, the research in the general population and teachers' awareness of VV is limited. Such research is particularly important as many of the VV risk factors are modifiable which means that the individual awareness of these factors may reduce his/her risk of having VV. Furthermore, unawareness of VV symptoms may delay the seeking of treatment which can cause serious consequences such as hemorrhage, progressive skin changes that can lead to ulceration(14), and blood clots(15).

In view of the above, this study aimed in to investigate the prevalence and awareness of varicose veins (VV) among teachers and the general population of Taif city and find out the correlation and differences between teachers and other Taif residents with VV along with their socio-demographic characteristics.

Methods

This was a cross-sectional, observational, survey-based study conducted in Taif city, Saudi Arabia, from July 2021 to October 2021. Study ethical approval was obtained from Taif University's Institutional Research Board.

2.1 Study instrument

An electronic structured self-administered questionnaire was constructed using Google Forms. The questionnaire link was distributed to school teachers and the general population of Taif city. The enrolled participants were males and females aged between 25 and 60 years, excluding pregnant females.

The questionnaire included a brief introduction describing study objectives and emphasized the confidentiality of the participants. Participants were informed that completing the questionnaire represents consent to participate in the study.

The questionnaire was developed based on two previously validated questionnaires used in studies assessing the prevalence of VV among 366 nurses in Riyadh, Saudi Arabia, and VV awareness among 50 dental students in Tamil Nadu, India(16).

The first part of the questionnaire gathered data on the socio-demographic characteristics of the participants, including gender, age, marital status, educational level, and nationality. The second part collected information about the participants' behavior and health, including exercise, smoking habits, weight, height, comorbidities, gravidas/parities numbers, and hormonal therapy and contraceptive pills. Additionally, the participants were asked about work hours, hours of standing and sitting, and lifting heavy objects. Also, the participants were asked if they had previously been diagnosed with VV. Finally, the questionnaire evaluated the participants' awareness of VV, including the knowledge source, signs/symptoms, etiology, and preventive methods.

2.2 Sample size

The sample size required for this study was calculated using the calculation equation. The minimum sample size was estimated to be 384 from the general population and 376 from schoolteachers with a confidence level of 95% (CI-95%) and a 5% margin error. However, the number of participants involved in this study was 1,754. A simple random sampling method was used in this study.

2.3 Statistical analysis

Data analysis was conducted using SPSS version 28. Descriptive statistics were used to present the data, where numerical data were presented as mean and standard deviation with a 95% confidence interval. In contrast, categorical data were presented as count and percentage. Chi-square test and unpaired t-test at a 0.05 level of significance were used to assess the association of different factors and the participant's diagnosis with VV.

Results

A total of 1754 individuals (993 females) participated in the study (Table 1). About one-fifth of the participants (22.6%) were aged 25-29 years old, and another fifth (20.5%) were aged 40-44 years old. The nationality of 97.3% of the participants was Saudi, and the majority of the participants were married (72.1%). Most participants (85.6%) had a university degree or higher. Regarding smoking status, 82.9% of the participants were smokers, and 3.9% were past smokers.

Employment data of the participants were collected. The majority of the study sample was employed (84.5). More than half of the participants (58.4%) were in the education field. A high percentage of the participants (60%) work 4 to 8 hours per day, and the period of standing at work ranges from 1 to 3 hours (35.8%), 4 to 6 hours (34.2%), and 7 hours or more (4.4%).

The most common disease among the participants was diabetes mellitus (8.2%), followed by hypertension (5.4%). About one-tenth of the participants (9.4%) have received hormonal therapy. Female-specific medical history was also collected, and it was found that 18% of female participants use contraceptives, and 16.8% are in menopause. The majority of the female participants gave birth either naturally (41.8%), cesarean (14.1%), or both (16.1%). About half of the female participants (46.9%) reported working 1 to 3 hours on household chores, and 72.8% said they had help doing chores.

As shown in Figure 1,176 participants (10%) said they had been diagnosed with VV, and 491 participants (28.0%) said that at least one of their family members had been diagnosed with VV.

Table 2 presents the participants' knowledge about VV. More than half of the participants' (64.7%) knowledge source was a doctor. Regarding the main reason for VV, standing for an extended period was the most reported reason (60.8%), and about a fifth of the participants (19.8%) did not know the main reason. The most known symptoms of VV among the participants were bluish lumps in the leg (54.6%), swelling in the ankle and foot (25.8%), and heaviness in the legs (22.9%). Avoiding standing for long periods as a prophylactic measure against VV was recognized by 58.9% of the participants. Thirteen participants (0.7%) believed that VV could not be prevented.

The prevalence of VV among the different subgroups was studied and compared to identify patients' characteristics and lifestyles that could significantly increase the risk of developing VV, as shown in Table 3 and Table 4.

The prevalence of VV among females (15.9%) was significantly higher (p< 0.001) than that among males (2.4%).

Regarding participant's age groups, the highest prevalence of VV was reported among patients aged 55 years and more (21.1%) and those aged 50 to 54 years (15.2%), which is significantly higher (p<0.001) than the rates reported among younger patients (2.5% to 12.3%). The prevalence among widowed and divorced patients (30.8% and 12.8%, respectively) was significantly higher (p<0.001) than that reported among single (2.9%) and married (11.6%) participants.

In addition, educational level was found to significantly affect VV prevalence, where the prevalence among participants with primary education (39.1%) and non-educated participants (20.0%) was significantly higher (p<0.001) compared to participants with intermediate, secondary, and University or higher education (10.7%, 8.9%, and 9.7% respectively).

Smokers reported a significantly higher (p< 0.001) prevalence of VV (11.3%) compared to non-smokers (3.9%) and past smokers (2.9%).

Weekly exercising was also found to significantly affect the prevalence of VV, where the prevalence among participants who do not exercise (12.3%) was significantly higher (p=0.021) than the prevalence among participants who exercise for less than 150 minutes weekly (8.6%) and those who exercise for more than 150 minutes weekly (7.7%).

Long duration of standing at work (4 hours or more) was associated with a significantly higher prevalence rate of VV (p=0.002), where the prevalence of VV among participants who stand for one to three hours at work, those who stand for four to six hours, and those who stand for seven or more hours daily was 7.8%, 13.9%, and 14.1%, respectively.
A significantly higher rate of VV was reported among teachers (p<0.001) compared to other participants (6.1%), p<0.001.

Patients who had previously received hormonal treatment reported a significantly higher prevalence of VV (17.1%) compared to those who have not received hormonal therapy (9.3%), p=0.002.

Participants with a family history of VV reported a significantly higher prevalence of the disease (19.3%) compared to those with no family history (6.4%), p<0.001.

Longer duration of household chores (7 hours or more) was associated with a significantly higher prevalence of VV (31.1%) compared to shorter durations (11% to 18.1%), p<0.001.

Women in menopause reported a higher prevalence of VV (29.3%) compared to other women (13.2%), p<0.001.
Patients with VV reported a significantly higher mean± SD BMI (29.8±5.2 kg/m2) compared to those without VV (27.4±6.0 kg/m2), p<0.001.

In addition, the mean± SD number of pregnancies reported among women with VV (5.2± 2.8 pregnancies) was significantly higher than that among women without VV (3.2± 2.8 pregnancies), p<0.001. Similarly, the mean± SD number of children of women with VV (4.2± 2.3 children) was significantly higher than that among women without VV (2.6± 2.3 children), p<0.001.

On the other hand, participants' nationality, number of working years, number of daily working hours, number of sitting and rest hours at work, lifting heavy things regularly at work or home, employment status, and using contraceptives were found to have no significant effect on the prevalence of VV (p>0.05). More details are provided in Table 1.

Table 1: Baseline Characteristics of participants (n=1754)

Study variables	Frequency	Percent (%)
Age (years)		
25 to 29 years	397	22.6
30 to 34 years	152	8.7
35 to 39 years	201	11.5
40 to 44 years	359	20.5
45 to 49 years	268	15.3
50 to 54 years	282	16.1
55 to 60 years	95	5.4
Gender		
Male	761	43.4
Female	993	56.6
Nationality		
Saudi	1707	97.3
Not Saudi	47	2.7
Marital Status		
Divorced	78	4.4
Married	1265	72.1
Single	385	21.9
Widowed	26	1.5
Educational Level		
Intermediate	28	1.6
Not educated	10	0.6
Primary	23	1.3
Secondary	192	10.9
University or higher	1501	85.6
Are you a smoker?		
Yes	1454	82.9
Past Smoker	68	3.9
No	232	13.2
For how long do you exercise weekly?		
I don't exercise	746	42.5
Less than 150 minutes	723	41.2
More than 150 minutes	285	16.2

Figure 1 Varicose veins history among study participants

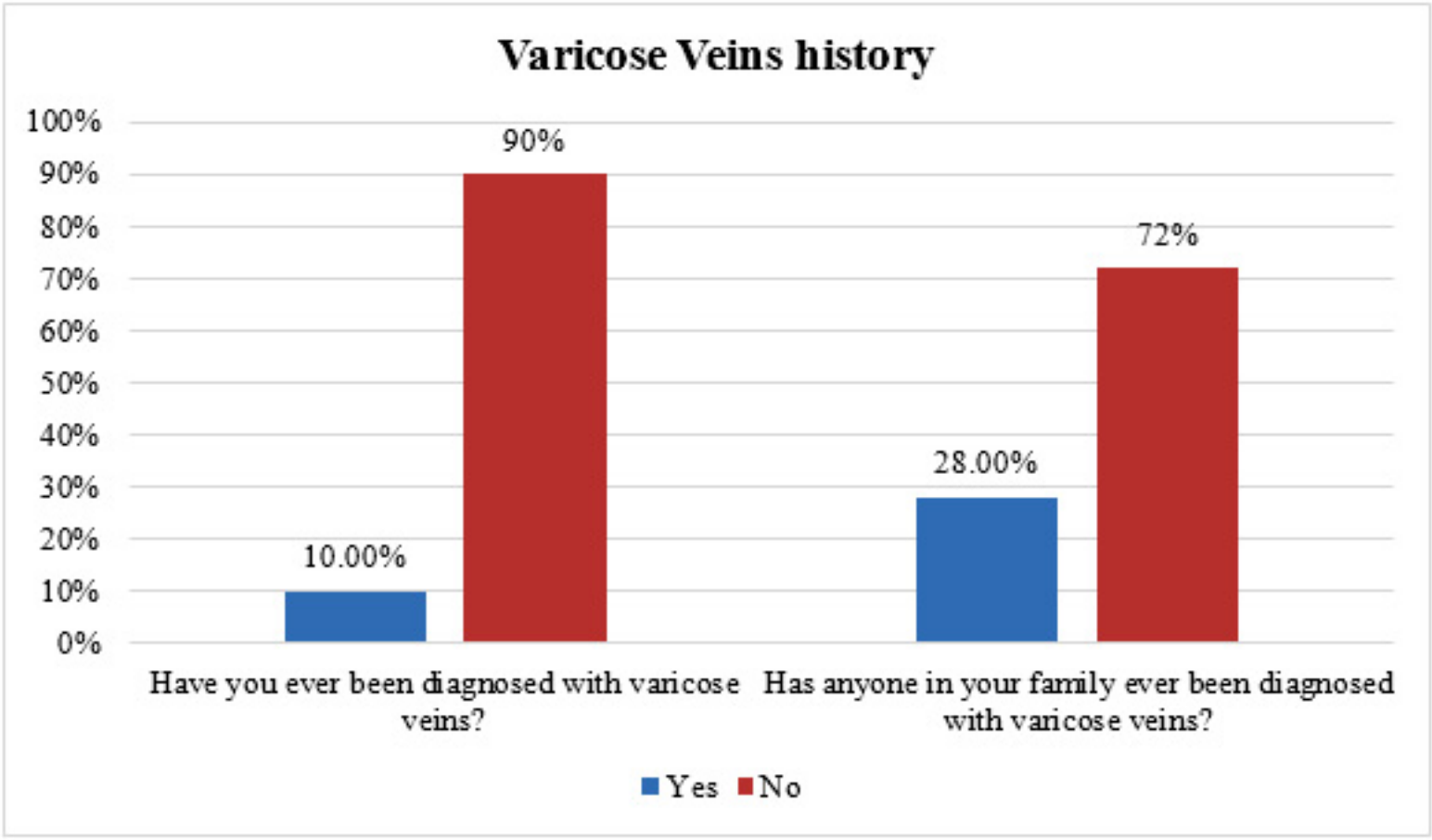

Table 2: Participants' knowledge about varicose veins (n=1754)

Study variables	Frequency	Percent (%)
What is the source of your knowledge of varicose veins?		
Doctor	1135	64.7
Varicose veins patient	155	8.8
Friends/ colleagues	117	6.7
Social media	91	5.2
Medical books and journals	69	3.9
Other	64	3.6
Family member with VV	53	3.0
Medical campaigns	41	2.3
What do you think is the main reason for varicose veins?		
Standing for a long period	1066	60.8
I don't know	347	19.8
Obesity	201	11.5
Hereditary	86	4.9
Aging	46	2.6
Previous injury	8	0.5
What do you think are the symptoms of varicose veins?		
Bluish lumps in the leg	962	54.8
Swellings in the ankle and foot	453	25.8
Heaviness in legs	402	22.9
Skin discoloration around the varicose veins	321	18.3
Feeling of discomfort	289	16.5
Leg pain and itching	247	14.1
Ulcer around the varicose area	103	5.9
I don't know	378	21.6
What do you think are the prophylactic measures against varicose veins?		
Avoid standing for long periods	1033	58.9%
Exercise to strengthen leg musdes	857	48.9%
Maintaining a healthy body weight	745	42.5%
Elevating legs while resting or sleeping	420	23.9%
Wearing compression stockings	283	16.1%
The disease can't be prevented	13	0.7%
I don't know	279	15.9%

Table 3: Patients' characteristics that could impact the prevalence of varicose veins (n=1754)

Have you ever been diagnosed with varicose veins?		Yes		No		Total	P-value
		Count	%	Count	%		
Gender	Female	158	15.9	835	84.1	176	<0.001
	Male	18	2.4	743	97.6	1578	
Age (years)	25 to 29	10	2.5	387	97.5	397	<0.001
	30 to 34	11	8.0	141	92.8	152	
	35 to 39	16	12.0	185	92.0	201	
	40 to 44	43	7.2	316	88.0	359	
	45 to 49	33	12.3	235	87.7	268	
	50 to 54	43	15.2	239	84.8	282	
	55 to 60	20	21.1	75	78.9	95	
Nationality	Saudi	172	10.1	1535	89.9	1707	0.725
	Not Saudi	4	8.5	43	91.5	47	
Marital Status	Divorced	10	12.8	68	87.2	78	<0.001
	Married	147	11.6	1118	88.4	1265	
	Single	11	2.9	374	97.1	385	
	Widowed	8	30.8	18	69.2	26	
Educational Level	Intermediate	3	10.7	25	89.3	28	<0.001
	Not educated	2	20.0	8	80.0	10	
	Primary	9	39.1	14	60.9	23	
	Secondary	17	8.9	175	91.1	192	
	University or higher	145	9.7	1356	90.3	1501	
Are you a smoker?	Yes	165	11.3	1289	88.7	1454	<0.001
	Past Smoker	2	2.9	66	97.1	68	
	No	9	3.9	223	96.1	232	
For how long do you exercise weekly?	I don't exercise	92	12.3	654	87.7	746	0.021
	Less than 150 minutes	62	8.6	661	91.4	723	
	More than 150 minutes	22	7.7	263	92.3	285	
Number of working years	1 to 5	9	5.8	145	94.2%	154	0.051
	11 to 15	18	9.7	167	90.3	185	
	16 to 20	18	10.1	161	89.9	179	
	21 to 25	27	10.1	241	89.9	268	
	26 to 30	34	17.1	165	82.9	199	
	6 to 10	25	11.6	190	88.4	215	
	> 30	12	11.4	93	88.6	105	
Number of daily working hours	4 to 8 hours	118	11.2	935	88.8	1053	0.298
	Less than 4 Hours	4	5.5	69	94.5	73	
	More than 8 hours	21	11.7	158	88.3	179	
How many hours do you stand at work	1 to 3 hours	49	7.8	579	92.2	628	0.002
	4 to 6 hours	83	13.9	516	86.1	599	
	7 or more	11	14.1	67	85.9	78	
How many hours of sitting and rest at work?	1 to 3 hours	115	11.1	917	88.9	1032	0.911
	4 to 6 hours	25	10.3	217	89.7	242	
	7 or more	3	9.7	28	90.3	31	
Does your job require heavy lifting on a regular basis?	Yes	11	10.3	96	89.7	107	0.815
	No	132	11.0	1066	89.0	1198	
Are you a teacher?	Teacher	130	13.1	866	86.9	996	<0.001
	Other	46	6.1	712	93.9	758	
Are you employed	Employed	146	9.9	1336	90.1	1482	0.552
	Unemployed	30	11.0	242	89.0	272	

Table 3: Patients' characteristics that could impact the prevalence of varicose veins (n=1754) (continued)

Have you ever been diagnosed with varicose veins?		Yes		No		Total	P-value
		Count	%	Count	%		
Have you received any hormonal treatment?	Yes	28	17.1	136	82.9	164	0.002
	No	148	9.3	1442	90.7	1590	
Has anyone in your family been diagnosed with varicose veins?	Yes	95	19.3	396	80.7	491	<0.001
	No	81	6.4	1182	93.6	1263	
Are you aware of varicose veins?	Yes	101	16.3	518	83.7	619	<0.001
	No	75	6.6	1060	93.4	1135	
Does anyone help you with household chores?	Yes	119	16.5	604	8305	723	0.440
	No	39	14.4	231	85.6	270	
Household chores hours	1 to 3 hours	55	11.8	411	88.2	466	<0.001
	4 to 6 hours	62	18.1	280	81.9	342	
	7 or more	32	31.1	71	68.9	103	
	None	9	11.0	73	89.0	82	
Does your work at home require carrying heavy things regularly?	Yes	39	18.2	175	81.8	214	0.296
	No	119	15.3	660	84.7	779	
Do you use contraceptives?	Yes	32	17.9	147	82.1	179	0.427
	No	126	15.5	688	84.5	814	
Did your period stop (menopause)?	Yes	49	29.3	118	70.7	167	<0.001
	No	109	13.2	717	86.8	826	
Type of previous delivery	Both	34	21.3	126	78.8	160	<0.001
	Cesarian	17	12.1	123	87.9	140	
	Natural	98	23.6	317	76.4	415	
	No previous pregnancy	9	3.2	269	96.8	278	

*Chi-square test at a 0.05 level of significance.

Table 4: Factors affecting the prevalence of varicose veins

Have you ever been diagnosed with varicose veins?	Yes		No		Total	P-value*
	Mean	SD	Mean	SD		
BMI (kg/m^2)	29.78	5.15	27.43	5.98	1754	<0.001
Number of pregnancies	5.21	2.84	3.22	2.83	993	<0.001
Number of children	4.16	2.25	2.58	2.29	993	<0.001

*Unpaired t-test at a 0.05 level of significance.

Discussion

Prevalence among the general population

One-tenth of the study participants reported that they were diagnosed with VV. A similar percentage (11%) was reported by Al-Ghamdi et al., who studied the prevalence of VV among the general population in Saudi Arabia (17). Compared with the findings of studies conducted in the Middle East, the prevalence of VV in the current study was lower than that reported in an Iraqi study that assessed the VV among different occupational backgrounds (19.5%)(18). Likewise, a higher prevalence of VV was observed among Women of Childbearing Age Attending a Primary Health Care Unit in Cairo, Egypt (51.1%)(19).

VV risk factors

In line with several other studies(12,20,21), the current study results indicated that being a female can significantly increase the risk of having VV compared to males. The researchers attribute this association to the female sex hormones, progesterone, and estrogen, which affect the vascular smooth muscle(22). The hypothesis of hormonal involvement in the increased risk of VV can be supported by this study's results, as those who received hormonal treatment before reported a significantly higher prevalence of VV.

Moreover, the number of pregnancies and children was significantly associated with a higher prevalence of VV among females. So, it may contribute to the greater predominance of VV in females. The association between the number of pregnancies and VV is supported by the findings of a systemic review and meta-analysis conducted by Ismail L. et al. that analyzed nine studies enrolling 17,109 women(23).

Another well-known risk factor of VV that the current study confirmed is older age(21,24–26). Age-related increases in the risk of VV can be linked to calf muscle weakness, a decline in vein matrix components(27), and a decrease in physical activity(28).

The heritability component for VV predisposition has been proposed for decades(24,29–31). Among the participants of this study, those with a family history of VV had a significantly higher prevalence of VV. Similarly, a significant relationship was observed in a study conducted in India, where out of 216 VV patients, 132 patients had a family history of VV(32). However, reporting VV family history is subject to bias(33), which casts doubt on the credibility of such findings and warrants more studies in this area.

Despite having many non-modifiable risk factors, a healthy lifestyle can decrease the risk of developing VV. A significant increase was observed in the prevalence of VV in those who do not exercise regularly compared to those who exercise more or less than 150 minutes per week. Several studies have assessed the protective role of regular exercise against VV. In line with this study, Abelyan G et al. reported that regular exercise in the form of walking for five days or more weekly might decrease the odds of having VV(34). On the contrary, there was no significant correlation between exercise and the development of VV in the study of Yun et al. (35). This contradiction may be attributed to the differences in the definition of regular exercise among these studies.

However, regular exercise can lead to weight loss and a decrease in BMI, which was found to be a significant risk factor for VV in this study. Obesity can lead to systemic inflammation, which is a proposed cause of VV(36). This can be supported by the research that declares VV as the most advanced disease among obese patients(37) and the established significant correlation between the BMI value and VV clinical severity (38).

Similar to obesity, smoking can cause systemic inflammation in addition to venous endothelial injury and increase the risk of VV(36). In accordance with this, in the current study, the smokers reported a significantly higher VV prevalence than non-smokers and past smokers. Likewise, a study conducted on a sample of the Egyptian population reported 2.53 times higher odds of lower limb VV for smokers than ex-smokers/non-smokers(39).

In literature, standing for long periods is the most mentioned risk factor for VV(17,37,39–42). In the current study, the duration of standing for 4 hours or more was significantly associated with a higher prevalence of VV. A threshold of 3 to 4 hours of standing was mentioned in a systemic review that assessed the relationship between lower limb VV and occupational constraints among working adults(41). In a more in-depth analysis of the correlation, a cross-sectional conducted in Dhulikhel hospital reported that the odds of having VV increase 27 times for every hour increase in standing time per day(40).

The participants' knowledge about VV

More than half of the participants were aware that standing for long periods is the main reason for VV, and about one-fifth did not know the main reason. As it is a modifiable risk factor, the significant role of standing for long periods should be more known.

The participants' knowledge about the VV symptoms was not satisfactory regarding bluish lumps in the leg. VV symptoms were known by less than one-third of the participants. As VV can get worse if not treated and the VV symptoms may vary from one patient to another, the awareness of all VV symptoms may lead the patient to seek treatment earlier and prevent the VV complications(14).

In light of these results, educational campaigns are warranted. These campaigns should be targeted to spread knowledge about the VV risk factors and how to improve them. Several easy-to-apply prevention methods were mentioned in the literature, including regular exercise for 15–20 mins a day, uplifting leg regularly, maintaining an ideal weight, and consuming a healthy diet including high fiber and low salt diet(37). As a guideline for such campaigns, the structured teaching program implemented in Chennai, India, can be followed as it was found to be

highly effective in improving the participating teachers' knowledge about VV prevention and management.

According to the current study results, it is worth noting that easy-to-understand language should be used in addressing the general population as VV is more prevalent in the lower education class. Additionally, as doctors were the main source of information about VV for the participants in this study, healthcare professionals should activate their roles in increasing awareness about VV and its risk factors.

Prevalence among teachers

Even though a school teachers' job is a stressful profession with a large workload(43), to date, only a few studies have been done to assess the schoolteachers' health. In terms of VV, of which school teachers may have many of its risk factors, the studies that have addressed this problem are much fewer.

Teaching involves a long duration of standing with limited free time to exercise, which are both proven risk factors for VV. Among the current study participants, school teachers had a significantly higher VV prevalence than other professions. However, the prevalence is lower than the one reported among teachers in Abha, Saudi Arabia (13.1% vs. 42%)(11). Likewise, Ilyas et al. reported a 37.8% prevalence among teachers in Lahore, Pakistan(44).

Regarding participants with different occupations, the nurses in Riyadh, Saudi Arabia, had a lower prevalence of VV (11%)(16). Similarly, the observed prevalence among traffic police in Nepal was 12%(45). On the other hand, female hairdressers had a much higher prevalence of VV (47.7%)(46). The common contributor between these occupations is long-standing hours. Such high rates can be reduced by trying to improve other risk factors like smoking and BMI and minimize the periods of standing as much as possible.

Limitations

The study data results are based on a self-administered questionnaire, which may result in recall and social desirability bias. Additionally, only those interested in the topic participated in the study, which may result in a selection bias. However, the enrolled sample size is much larger than the minimum required sample size which might minimize the effect of such limitations.

Conclusion

The current study results are consistent with previous studies regarding the prevalence of VV among the general population; the higher prevalence among school teachers, and the VV significant risk factors. We recommend education programs for the general population about the risk factors and how to prevent the development of VV. Additionally, the risk of VV can be minimized by improving work conditions for those who have to work standing for long hours, especially school teachers.

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