

## Research Article

# Risk Assessment of Varicose Vein among School Teachers of Dhulikhel Municipality

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## Abstract

**Background:** Varicose veins are abnormally dilated, tortuous superficial veins caused by incompetent venous valves. It is most common in prolonged standing professionals such as teachers, nurses, traffic police, shopkeepers, and bus conductors who have to stand daily for long. Likewise, teachers are also of those occupations requiring prolonged standing which puts them at risk of varicose veins.

**Objective:** To assess the risk of varicose veins among school teachers of Dhulikhel Municipality and its associations with independent variables.

**Methods:** A cross-sectional study was conducted among 135 teachers working in different schools of Dhulikhel municipality. Convenience sampling technique was used for data collection. Data were collected with the questionnaire developed by Robin Man Karmacharya used in the varicose veins risk assessment study 2 and collected by an interview technique. Statistical Package for Social Science (SPSS) Version 25 was used for data analysis. Socio demographic data are presented in frequency and percentage and Chi square test was applied to find out the association of independent variables with risk of varicose veins.

**Results:** Nearly half percent (43.7%) of the responders belong to the age group of 20 to 30. The highest percentages (78.5%) of responders were female. The highest percentage of responders had occasional tingling sensation in legs (45.2%). More than half 76(56.3%) were identified as at the risk of varicose veins. Risk of varicose veins was statistically significant with age, BMI and working experiences.

**Conclusion:** More than half of the teachers are at the risk of developing varicose veins. School teachers with increasing age, high BMI and work experience are associated with the risk. Concerned authority need to take timely action to prevent varicose vein among these groups of teachers.

**Key words:** Varicose vein; Teacher; Assessment; Risk

## Introduction

Varicose Veins (VV) are abnormally dilated, tortuous superficial veins caused by incompetent venous valves. This condition commonly occurs in the lower extremities, the saphenous veins, though it can also occur elsewhere in the body such as esophagus [1,2]. In the global scenario, the incidence of varicose veins varies between 10% and 60% and is termed to be higher in the Asian region as compared to up to 30% in the Western world [3]. Likewise, Among Pakistani teachers it is found that the prevalence rate of varicose veins was 37.8% [4]. According to the Annual report of the Department of Health Services (DOHS) of Nepal for 2071/72) Nepal, Varicose vein incidence is (70.77%) in male and (29.23%) in female.

Prolonged standing and advancing age are the important factors for the development of varicose vein [3]. It is most common in professions which require prolonged standing such as teachers, and nurses [2]. Likewise age, sex, obesity, pregnancy, smoking, history of leg injury or deep venous thrombosis and family history are other risk factors. Once the valve is damaged, there is a reversal of blood flow from deep to superficial vein. The condition gets more severe with the duration of standing hours leading to several complications such

as ulcers, bleeding, blood clots, edema, dermatitis, ulceration and thromboembolism if left untreated [2,4-6].

Teachers in our settings are compelled by the nature of their profession to stand or sit for long hours during lecture, and other academic works, placing them at the risk for venous insufficiency which makes them prone to Chronic Venous Insufficiency (CVI) and varicose veins [3,4-7]. Which in the longer run causes significant impact on the quality of life of the teachers. Standing and walking becomes very uncomfortable and heaviness accompanied with dull aching pain increases in intensity [5]. Moreover, the protective factors for varicose veins includes lifestyle modifications such as maintaining healthy weight, regular moderate physical exercises, elevating legs to ease the blood flow to lower limbs [6]. Therefore, there is a need to increase the awareness and educate the teaching faculties regarding varicose veins to maintain a good quality of life. This study aims to find out the risk of varicose veins among teachers and find out association of risk of varicose veins with selected independent variables.

Varicose vein of the lower limb is the most common and underestimated peripheral vascular disease, though the number of patients with varicose vein admitted in the ward of DH per week has almost reached the count of 100 [8]. Most of the Previous study shows that, varicose veins literacy score was high among 52.4% (more than 50% score) and low (less than 50% score) among 47.6%. Patients admitted for varicose vein surgery had less than 50% knowledge in different components of varicose vein [9]. Varicose veins, is a common disease with a major socioeconomic effect, the cost of chronic venous disorders includes its investigations, its management, and the loss of working days of the affected patients [10,11]. In the context of Nepal, teaching is an occupation requiring prolonged standing which puts them at risk of varicose veins which is suggested by both theoretical and practical evidence [12]. In Nepal, there is no evidence of research

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conducted about risk assessment of varicose veins among teachers. Different studies show they are unaware of this condition. Most of the patients visit hospitals only after they develop complications [13-15]. So, there is a need to assess risk of varicose veins among teachers to sensitize them for early identification of risk and follow preventive measures to prevent it and also seek medical advice on time. We aimed to identify the risk of varicose veins among school teachers and its association with independent variables.

## Methodology

A cross sectional observational study was conducted among school teachers working in the schools of Dhulikhel Municipality. There are a total of 38 schools with 550 teachers. Total five private schools were selected randomly for the study purpose. In addition, conducting research in this area is accessible and feasible to the researcher for data collection. The teachers who were already diagnosed with varicose veins were excluded. Sample size was determined *via* the following formula  $n = z^2 pq/d^2$  where P was obtained from a similar study conducted in Lahore, Pakistan [4]. Total of 135 school teachers who consented to participate in the study were selected with a convenience sampling method.

Researchers used the questionnaire developed and used in the varicose veins risk assessment study [2]. The first section includes self-structured socio demographic questionnaire characteristics of teachers and includes 10 questions. The second section includes 2 parts consisting of 21 questions. Rating scales for Symptoms of varicose veins including 11 questions with 3 choices (Never, Sometimes, Always). Checklists for signs of varicose veins including 10 questions with 2 choices (yes and no). Pilot testing of the instrument was done with 10% of the participants. Ethical approval was obtained from the Institutional Review Committee, KUSMS. Permission was obtained from the Section Officer, Education, Youth and Sports Department, Dhulikhel Municipality and the principals of the selected schools. Informed consent was obtained from the participants. Socio demographic data and symptoms of varicose veins were collected by a self administered questionnaire whereas; signs of varicose vein risk were assessed by the trained researcher. Total duration for data collection was 20 to 30 minutes per participant. Collected data was analyzed with Statistical Package for Social Science (SPSS) Version 25. Socio demographic and health related information were presented in frequency and percentage and Chi- square test was used to find out association of independent variables with the risk of varicose veins. Ap value<0.05 was considered statistically significant.

## Results

The data obtained was analyzed according to the objective of research. Data were analyzed by using Statistical Package for Social Science (Version 25). Frequency and percentage of the variables were calculated. Descriptive and inferential statistics were used Table 1. Shows that 43.7% of the participants belonged to the age group of 20 to 30 years. Among them, 78.5% were female and 50.4% of the participants were overweight. Standing hours were less than 6 hours per day for 73.3%. Most of the patients had no history of varicose veins and had no habit of smoking and regular exercise. Out of total, 76.3% of responders were primary level teachers.

Table 2 summarizes the distribution of symptoms of varicose veins. Among different symptoms, the highest percentage of responders had occasional tingling sensation in legs (45.2%) followed by nocturnal cramps (38.5%) and heavy feelings in leg (37%). Table 3 summarizes the signs of varicose veins among 135 school teachers.

12.6 % of responders had dilated tortuous veins/ prominent veins followed by ankle swelling (3%). Table 4 Based on the operational definition of risk of varicose veins, 76 responders (56.3%) had a risk of developing varicose veins. Table 5 shows the association between risk of varicose vein and different study variables. Risk of varicose vein was statistically significant with certain variables like age, BMI and working experiences. However, there were no significant association between risk of varicose vein and certain variables like sex, standing hours, family history, smoking, regular exercise and level of teaching.

**Table 1:** Socio-demographic information of the respondents (n=165).

Characteristics	Frequency	Percentage (%)
<b>Age</b>		
<20 years	13	9.6
20-30 years	59	43.7
30-40 years	45	33.3
>40 years	18	13.3
<b>Sex</b>		
Female	106	78.5
Male	29	21.5
<b>BMI</b>		
Underweight	7	5.2
Normal	41	30.4
Overweight	68	50.4
Obese	19	14
<b>Standing Hours</b>		
< 6 hours	99	73.3
≥ 6 hours	36	26.7
<b>Family History</b>		
Yes	18	13.3
No	117	86.7
<b>Smoking</b>		
Yes	2	1.5
No	133	98.5
<b>Exercise</b>		
Yes	21	15.6
No	114	84.4
<b>Level of teaching</b>		
Primary Level	103	76.3
Secondary Level	32	23.7

**Table 2:** Distribution of symptoms of varicose vein (n=165).

Symptoms	Frequency of occurrence (%)		
	Never	Sometimes	Always
Leg pain worsening during work	94 (69.6)	40 (29.6)	1 (0.7)
Burning or itching sensation in legs	103 (76.3)	32 (23.7)	0
Leg or ankle swelling	125 (92.6)	9 (6.7)	1 (0.7)
Heavy feeling in legs	85 (63)	50 (37)	0
Skin discoloration in legs	129 (95.6)	6 (4.4)	0
Scars	133 (98.5)	1 (0.7)	1 (0.7)
Pain not relieved though medication is taken	134 (99.3)	1 (0.7)	0
Itching around one or more veins	130 (96.3)	5 (3.7)	0
Skin eczema	134 (99.3)	1 (0.7)	0
Tingling sensation in legs	73 (54.1)	61 (45.2)	1 (0.7)
Nocturnal cramps	81 (60)	52 (38.5)	2 (1.5)

## Discussion

The overall risk of varicose vein among school teachers was 56.3% with 44.44% risk in female and 11.86% in male which is higher than the finding obtained by a study done in traffic police of Kathmandu metropolitan city, where the risk of varicose vein was 12% with 11% male participants and 1% female. Also, findings of another study carried out among city police in Karnataka, India have a risk of varicose vein in 20% of the population. The difference in results may be due to lower physical activities of teacher than traffic police [2,16].

**Table 3:** Distribution of Signs of Varicose Vein (n=135).

Observed signs	Frequency (%)	
	Yes	No
Veins are tender to touch	0	135 (100)
Dilated tortuous veins/prominent veins	17 (12.6)	118 (87.4)
Elevated temperature on palpation of veins	0	135 (100)
Ulcers	0	135 (100)
Skin Scars (spontaneous)	1 (0.7)	134 (99.3)
Eczema	1 (0.7)	134 (99.3)
Ankle swelling	4 (3)	131 (97)
Paler areas over healed ulcers	0	135 (100)
Pigmentation (purple/blue)	0	135 (100)
Varicosities	0	135 (100)

**Table 4:** Risk of Varicose Veins (n=135).

Risk of varicose vein	Frequency (%)
Yes	76 (56.3%)
No	59 (43.7%)

**Table 5:** Association between risk of varicose vein and selected study variable (n= 135).

Characteristics	Risk present	Risk absent	p value
<b>Age</b>			
<20 years	11 (84.6)	2 (15.4)	0.037
20-29 years	25 (42.4)	34 (57.6)	
30-40 years	25 (55.6)	20 (44.4)	
>40 years	15 (83.3)	3 (16.7)	
<b>Sex</b>			
Female	60 (56.6)	46 (43.4)	0.89
Male	16 (55.2)	13 (44.8)	
<b>BMI</b>			
Underweight	3 (42.9)	4 (57.1)	0.013
Normal	15 (36.6)	26 (63.4)	
Overweight	45 (66.2)	23 (33.8)	
Obese	13 (68.4)	6 (31.6)	
<b>Standing hours</b>			
<6 hours	55 (55.6)	44 (44.4)	0.774
≥6 hours	21 (58.3)	15 (41.7)	
<b>Working experiences</b>			
0-5 years	35 (48.6)	37 (51.4)	0.037
6-10 years	17 (56.7)	13 (43.3)	
11-15 years	7 (53.8)	6 (45.2)	
>15 years	17 (85)	3 (15)	
<b>Family history</b>			
Yes	11 (61.1)	7 (38.9)	0.658
No	65 (55.6)	52 (44.4)	
<b>Exercise</b>			
Yes	14 (66.7)	7 (33.3)	0.297
No	62 (54.4)	52 (45.6)	
<b>Level of teaching</b>			
Primary Level	56 (54.4)	47 (45.6)	0.418
Secondary Level	20 (62.5)	12 (37.5)	

In the present study, participants of age group less than 20 are at higher risk of developing varicose veins i.e., 84.6% than other age groups similar to the findings of the study carried out in city police of India where risk is more in age groups less than 30 years. But the risk of varicose vein among teachers in Saudi Arabia was more in the age group above 50 years of age. This difference may be due to decreased physical activities of youth in Nepali society [16-18].

In my study, the risk is more in female participants (56.6%). This is similar to the study done in Saudi Arabia among teachers where the result showed more risk to female participants [18].

The present study concluded that the risk is more among obese followed by overweight than those with normal BMI i.e., 68.4% and 66.2% respectively. Similar result has been obtained in the study

conducted in teachers of Assiut Governorate with 60.2% with obese. It is also supported by the study among teachers in Saudi Arabia and Chennai India had higher risk with obese one [6,18,19].

It has been shown in the present study that the risk was 58.3% among those who stand for more than 6 hours and 55.6% for those who need less than 6 hours of standing. It is supported by the findings of the study done in traffic police of Kathmandu metropolitan city that risk is greater in those who need standing more than 6 hours/day. Also, findings of study carried out among teachers in Saudi Arabia shows more risk in those who stand more than 7 hours/day i.e. 21.1. Similarly, in one study conducted in India among city police [2,16-18].

Majority of the participants (85%) with risk of varicose vein had working experiences greater than 15 years which is similar to the findings of teachers working for more than 16 years in Saudi Arabia. Similarly, secondary level teachers in Assiut Governorate who stand for more than 20 years are at greater risk of varicose vein. Also supported by the findings of study among teachers carried out in Chennai, India with working experience greater than 20 years [6,18,19].

The present study concludes about 2/3 of the participants (61.1%) participants with family history of varicose vein had risk of varicose vein similar to the study among secondary schools' teachers in Assiut governorate with 58.6% with family history had risk.6 In my study, there is no any risk associated with smoking. It may be due to the small sample size.

#### Association between risk of varicose vein and selected variables

In this study, there is statistically significant association between age group, BMI and work experience with the risk of varicose vein with p value less than 0.05. This result is supported by the findings of the study conducted in Chennai India among school teachers [19]. This result is further consistent with the study conducted among teachers in Assiut Governorate [6]. Age and working experience has association with risk of varicose vein which is also supported by a study done among nurses in Riyadh [20]. This may be due to enhanced pressure of surface vein with increase in working experiences and increased in BMI.

There is statistically insignificant association between risk of varicose vein and; sex and standing hours as p value is greater than 0.05 which is supported by the study findings carried out among city police in Karnataka India.16 Similarly, family history and risk of varicose vein has no significant association as p value is 0.658 which is similar to the study done among nurses in Iran [21]. This may be due to they were unaware about the family history, lifestyle that could increase the risk of varicose vein and preventive measures of the disease.

Similarly, there is no statistically significant association between risk of varicose veins and regular exercise in my study as p value is less than 0.05 which is supported by the study findings among nurses in Riyadh [20]. This may be due to teacher believe that teaching is one of the effective exercises as they need walking and standing alternately but in actual, these activities are the contributing factors for developing varicose veins.

Given the fact that the study has been supported by various literatures, association between risk of varicose vein and variables like gender, daily standing hours, smoking and family history were

not seen in my study which might be because of sample bias, small sample size and differences in sampling technique from that of the previous literatures. This is why statistical significance might not have been observed.

## Conclusion

This was a cross-sectional study among school teachers with the objective to find out the risk of varicose veins. The overall risk of varicose veins was found among more than half of the participants and the frequency of prevalence of this risk was higher in female participants. Age, BMI and work experience were significantly associated with the presence of risk of varicose veins. The findings of the study suggest that school teachers are vulnerable for developing varicose veins.

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