PREVALENCE OF VARICOSEVEINS AMONG SCHOOL TEACHERS

Rajan Balakrishan[1*],Nimya.NK[1*], Linsha.k,Vijay Selvan N,Arun.B

[1]Faculty of Health Sciences,Nursing and Education, MAHSA University, Malaysia

[*]Corresponding author: rajan@mahsa.edu.my

Abstract

Varicose veins pose a significant occupational health issue, particularly impacting certain professions carrying a higher risk due to prolonged periods of standing, like school teachers. The primary cause of varicose veins can be attributed to weakened or damaged valves, which disrupt normal blood flow. This study aimed to identify the prevalence of varicose veins in teachers. This cross-sectional survey was conducted among school teachers in Malappuram, Palakkad, and Calicut districts. For analysis, Venous clinical severity score (VCSS) was collected through Google Forms. This questionnaire was emailed to the teachers in the schools selected in the districts. Responses were recorded and taken for analysis. A total of 101 forms were found eligible for this study based on predetermined criteria. The study revealed a concerning prevalence of varicose veins among teachers, with 54.4% of participants reporting experiencing this condition at some point during their teaching careers. Among those affected, 27% reported occasional pain, while 19.8% experienced daily pain in the lower limbs. Additionally, 19.8% of the subjects reported varicose edema in the afternoon. These varicose veins had a significant impact on the activities of daily living and the occupational functioning of the majority of school teachers. This study concluded that a high prevalence rate of 54.4% for varicose veins among school teachers. The findings underscore the need for increased awareness and measures to address this health concern within the teaching profession. By implementing preventive strategies and supporting affected teachers, educational institutions can prioritize their valuable teaching staff's well-being and overall health.

Keywords: Varicose vein, Standing Posture, Venus clinical severity score, School teacher, Google form.

Introduction

Varicose veins are a prevalent form of vascular condition characterized by dilated and easily palpable subcutaneous veins, mainly found in the legs[1]. Varicose veins are the most common type of vascular disease, presenting a significant health concern affecting many individuals worldwide. Varicose veins manifest as swollen and enlarged veins, most commonly occurring in the legs, ankles, and feet[2]. The primary cause of varicose veins can be attributed to weakened or damaged valves, which disrupt normal blood flow[3]. Unlike arteries that carry blood from the heart to the body's tissues, veins transport blood back to the heart for recirculation[4].

The intricate circulatory system of the human body comprises both arteries and veins, each playing a crucial role in maintaining proper blood circulation. Arteries transport oxygen-rich blood from the heart to the body's tissues, nourishing them with vital nutrients and oxygen[3]. Conversely, Veins are responsible for returning deoxygenated blood from the rest of the body back to the heart for reoxygenation and recirculation. Interconnected superficial and deep venous systems facilitate the process of venous blood returning to the right heart against gravity. These systems and non-junctional perforators work harmoniously in health but can lead to complications in disease states[4].

Occupational factors can contribute to the development of varicose veins, with certain professions carrying a higher risk due to prolonged periods of standing. Professionals in certain occupations, such as teachers, are at a higher risk of developing varicose veins due to prolonged periods of standing. Moreover, the prevalence of varicose veins is not confined to a particular region but is a widespread issue affecting millions globally[4]. In the United States alone, statistics reveal that approximately 1 in 22 individuals, accounting for 4.5% or 12.2 million people, are affected by varicose veins. The condition also disproportionately affects women, with an estimated 41% of all women experiencing abnormal leg veins by the time they reach their 50s[5].

Several studies have explored the association between occupational demands and the prevalence of varicose veins[6]. Among these studies, one investigation focused on school teachers, revealing a prevalence of varicose veins at 19% (95% CI-11.2-26.8). Notably, 89.5% of those affected had a history of standing for prolonged durations. The findings

from this study emphasized the significance of prolonged standing as a significant risk factor for the development of varicose veins, highlighting the need for health education and the implementation of measures to reduce working hours[7].

In India, varicose veins affect approximately one out of every four people over 50. The condition is more common in women compared to men. The return of venous blood from the lower limbs to the right heart, against gravity, occurs through interconnected superficial and deep venous systems[8]. These systems and non-junctional perforators, such as the SFJ and SPJ, play a vital role anatomically and functionally in the context of health and disease. While the exact causes of varicose veins may vary among individuals, certain common factors contribute to their development[9]. As mentioned earlier, prolonged standing is a significant risk factor, but age, height, body mass index (BMI), and the number of childbirths has also been associated with varicose veins[7].

Diagnosing varicose veins has evolved, with traditional tourniquet tests replaced by advanced ultrasound techniques such as hand-held Doppler and duplex. These non-invasive methods provide detailed insights into the condition of the veins, enabling healthcare professionals to make informed treatment decisions[10].

When treating varicose veins, various options are available, each with its benefits and considerations. Conventional varicose vein surgery has proven to be both clinically effective and cost-efficient. However, advancements in medical technology have led to alternative treatments, such as laser and radiofrequency procedures, which offer less invasive options. Despite these advancements, some varicosities still require removal through phlebotomies or sclerotherapy[9].

The symptoms of varicose veins are often easily recognizable, with evident misshapen veins being the primary indicator, particularly on the legs. Patients may also experience pain, swelling, heaviness, and achiness in the affected areas. In severe cases, varicose veins can lead to significant bleeding and the development of ulcers[10]. Other discomforts associated with this condition include aches or pain after prolonged standing, cramp-like sensations in the legs, nocturnal leg cramps, muscle fatigue, ankle edema, and a sense of heaviness in the legs. Additionally, restless legs syndrome has been observed as a

common overlapping clinical syndrome in individuals with varicose veins and chronic venous insufficiency[9].

To assess the severity of varicose veins and their impact on a patient's well-being, healthcare professionals employ the Venous Clinical Severity Score (VCSS) scale. Developed from elements of the CEAP classification (Clinical grade, Etiology, Anatomy, Pathophysiology), the VCSS encompasses three key elements: the venous disability score, the venous segmental disease score, and the venous clinical severity scores[11].

Since varicose veins present a prevalent vascular condition affecting a significant portion of the population globally[12], the condition's link to prolonged standing in certain occupations underscores the importance of workplace ergonomics and the need to reduce the risk of varicose veins among susceptible individuals. Teaching is a profession requiring standing longer, and they are more susceptible to varicose veins[13]. Since there are few studies on the prevalence of varicose veins in teachers, this study aimed to identify the prevalence of varicose veins in teachers.

Methodology

The study employed a cross-sectional survey design with a sample size of one hundred and one teachers who were willing to participate in this study. This study was conducted at schools in Malappuram, Palakkad, and Calicut districts. The inclusion criteria encompassed individuals between the ages of 35 to 58, both male and female, who had at least ten years of teaching experience, were willing to participate in the research and could adhere to its requirements. Additionally, subjects had to refrain from strenuous physical activity and reside in Palakkad, Malappuram, or Calicut districts. However, those with psychiatric disorders or mental disabilities, lack of cooperation, already having lower limb pain, history of varicose veins, without access to the internet, or recent surgery were excluded from the study.

Data was collected through an online survey using a Google form questionnaire. The outcome measure employed was the Venous Clinical Severity Score (VCSS). The Google form was created and validated by a senior physiotherapist with over ten years of experience in varicose vein management. Initially, the Google forms containing the VCSS

questionnaire were shared in an individual email. The participants were requested to complete the questionnaire and submit their responses diligently.

Two hundred and forty-three (243) questionnaires were sent to individual emails. After sending the questionnaire to 243 participants, out of which 157 replied. Among these, 76 responses still needed to be completed. Again, the Google form was resent to the participant, and a reminder was sent to them. They were all reminded to complete the questionnaire within ten days. After this waiting period, 20 replies were received, and no further communications were sent to the remaining 46 participants due to time constraints. Therefore, a total of 101 participants ultimately responded with completed questionnaires. The VCSS measures various aspects of venous disease, scoring each category on a severity scale from 0 to 3[11]. This dynamic scoring system emphasizes the most severe consequences of venous diseases, which are likely to respond significantly to therapy. The categories encompass skin changes and pigmentation, inflammation, induration, and ulcers. Furthermore, the VCSS also assesses the participants' quality of life concerning their condition. The results of the study were computed using SPSS 24.0. All the statistical analysis was made using inferential statistics.

Result and Discussion

Results

Once the forms were collected, they were analyzed by the team of experts; all the forms were assigned and evaluated using the statistical analysis. The demographic analysis is shown in Table I, and Table II calculated the prevalence. Graphical representations are also shown below. Table III shows the varicose pain in the participants. Table IV shows the time zone of pain. Table V shows the pattern of pain occurrence. Last Table vi shows the severity of inflammation based on the stages.

Table I

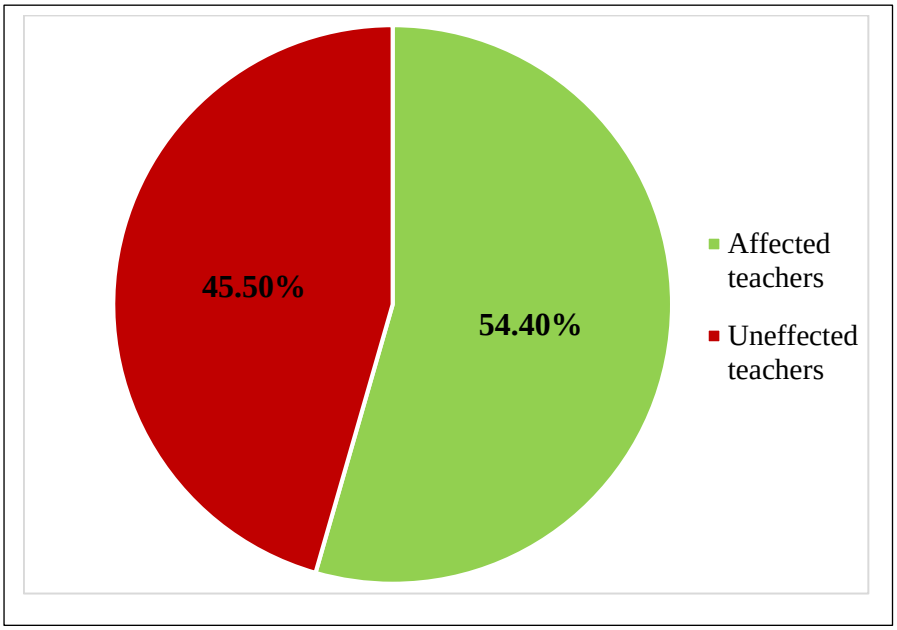
Demographic Analysis		
Age in years		**35—58 years**
Gender (101)	Male	20
	Female	81

Table II

Prevalence Calculation	Number of Teachers with varicose ÷ Total number of teachers × 100
	55 ÷ 101×100 = 54.4%
Total Prevalence	54.4%

Graph I

Prevalence of Varicose Vein



Varicose veins in the subjects with Pain

	Pain	No of subjects	Percentages
Varicose Vein	Yes	55%	54.4%
	No	46%	45.5%
	Total	100%	100%

Table IV

Teachers having varicose edema in multiple time zones

Venous edema	No of people	Percentage
No edema	50	49.6%
Morning	3	2.97%
Afternoon	28	27.7%
Evening only	20	19.8%

Graph II

Time zones of Varicose Vein

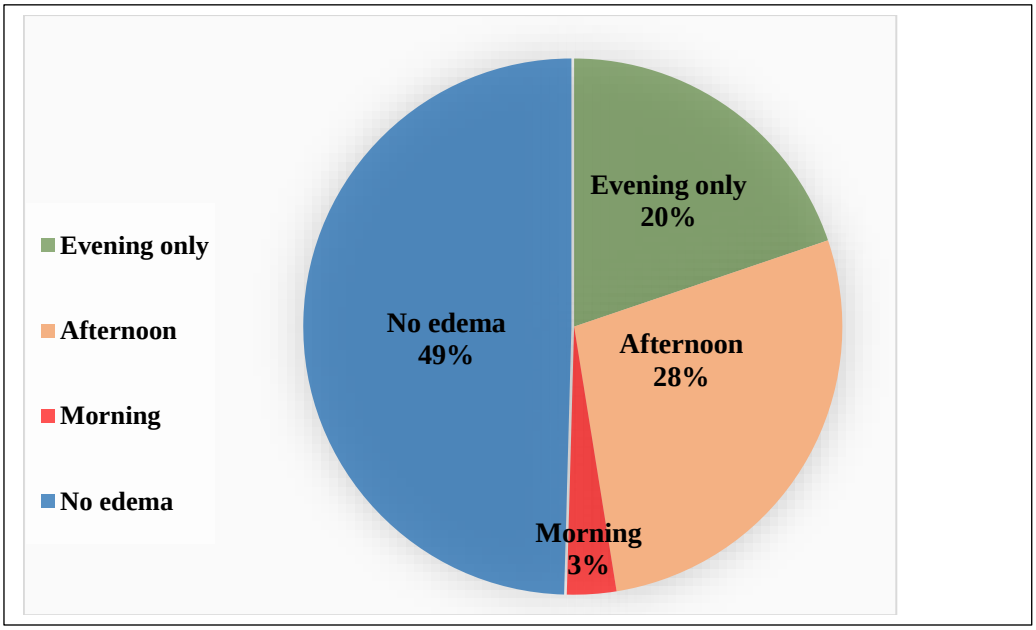


Table V

Pattern of pain occurrence

Occurrence of Pain	No of people	Percentage
Occasionally	28	27.7%
Daily	20	19.8%
Daily widened	3	2.9%
No pain	50	49.6%

Graph III

Pain Occurence

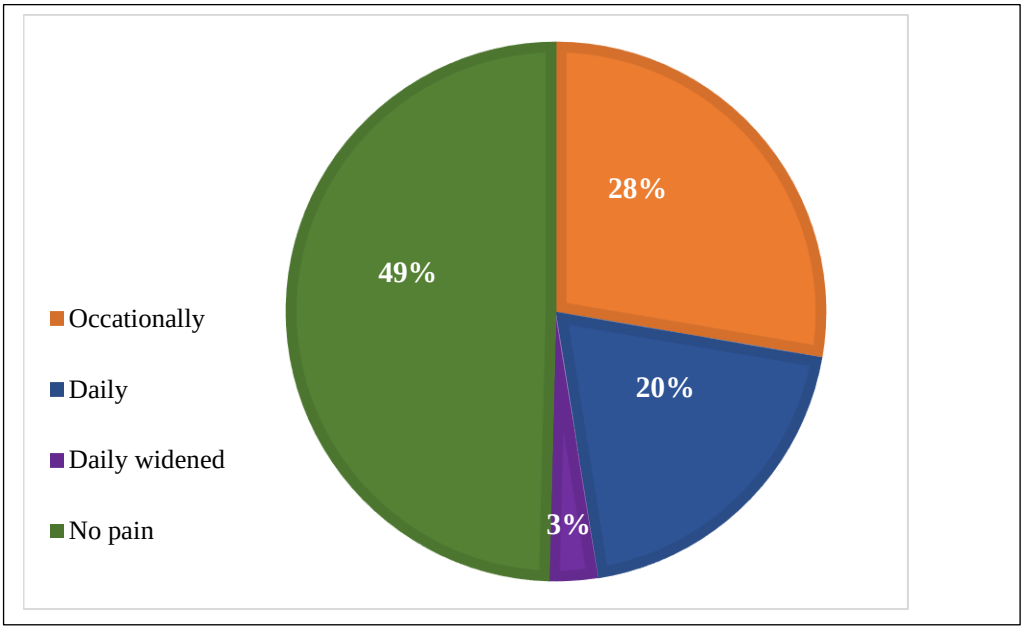


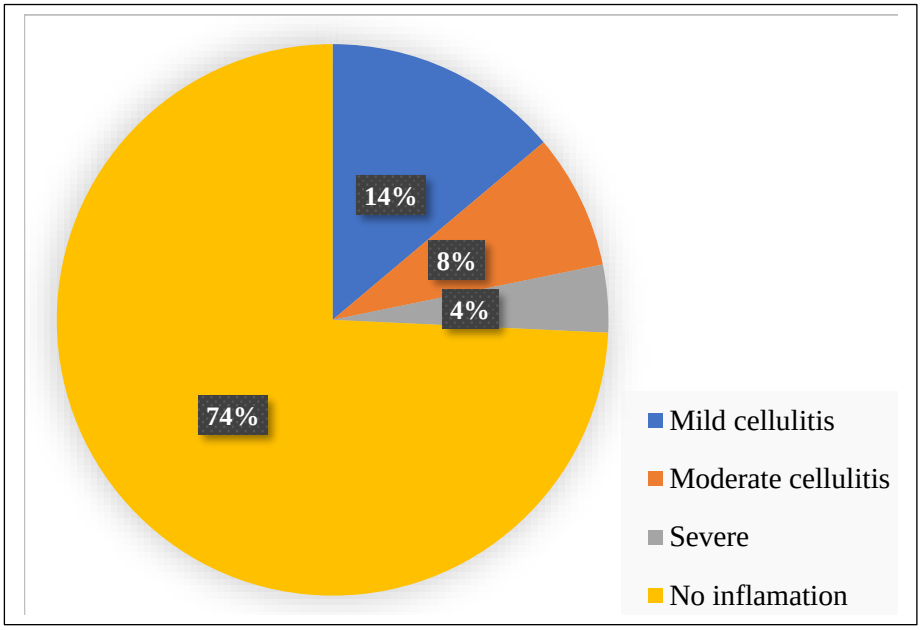
Table VI

Severity of Inflammation based on the Stages

Inflammation	No of people	Percentage
Mild cellulitis	14	13.9%
Moderate cellulitis	8	7.9%
Severe	4	3.9%
No inflammation	75	74.3%

Graph IV

Severity of Inflammation based on the Stages



Among the 101 participants in the study, 20 individuals (20%) were male, while 81 (80%) were female. The research revealed that 54.4% of teachers suffered from varicose veins, with most affected individuals falling within the age group of 25 to 58. Noteworthy factors predisposing teachers to varicose veins included extended working hours, prolonged standing postures, and being overweight. The presence of varicose veins significantly impacted the quality of life for those affected. Within the group of affected teachers, 14.9% displayed skin pigmentation in the lower limbs, which was limited in number and had occurred over an extended period.

Additionally, 10.9% exhibited diffuse and recent skin pigmentation. Among the subjects with varicose veins, 13.9% presented indurations around the ankle, with the size typically

being less than 5cm. Furthermore, 8.9% of the subjects experienced active lower limb ulcers lasting less than three months. The most commonly reported type of varicose vein was the blue line knot variation, and the prevailing characteristic of pain experienced was a dull ache.

Discussion

Varicose veins, characterized by twisted, enlarged, and protruding veins beneath the skin of the legs, are a common vascular condition[5]. They predominantly appear in the legs, ankles, and feet, making them the most prevalent type of vascular disease. Chronic varicose veins can significantly affect the lives of individuals, particularly those who spend long hours standing on their feet, such as surgeons, nursing staff, traffic workers, and teachers. Teachers, in particular, often stand for substantial periods during lectures and practical sessions, making them susceptible to developing varicose veins[13]. Therefore, this study aimed to assess the prevalence of varicose veins among teachers.
The study involved 101 subjects, including 20 males and 81 females, who were teachers. The assessment was conducted through the use of a questionnaire. The results revealed that 54.4% of teachers experienced varicose veins, with 7% males and 93% females. The study targeted teachers between the ages of 25 to 55. The Venous Clinical Severity Score (VCSS) scale was employed to evaluate the prevalence of varicose veins among teachers. This scoring system assesses various aspects of varicose disease, with each category rated on a severity scale from 0 to 3. By generating a dynamic score, the VCSS emphasizes the most severe consequences of venous diseases, particularly those likely to respond positively to therapy. These consequences include skin changes and pigmentation, inflammation, induration, and ulcers. Furthermore, the VCSS also evaluates the impact of varicose veins on the quality of life.

Varicose veins commonly cause leg pain, ranging from dull aching and cramping to radiating or dragging sensations[14]. Approximately 27% of individuals experience pain occasionally, while 19.8% have pain in their lower limbs daily. Rest often relieves discomfort, while prolonged standing tends to exacerbate the condition. Edema, or swelling, is also associated with varicose veins, with 19.8% experiencing it in the evening and 27.7% in the afternoon. About 18% of the affected subjects use compression therapy daily, with graduated compression hosiery being the primary form of treatment.

Compression stockings work by applying pressure to the superficial veins, keeping them collapsed and blood-free, thus encouraging blood flow into the deep venous system[15,16]. This therapy can help alleviate fatigue and achiness caused by varicose veins.

The study indicated that most affected subjects had over ten years of professional experience, with around 53% being over 38. The majority of them worked for approximately 5 to 6 hours per day. Interestingly, the ongoing problems associated with varicose veins typically started after entering the teaching profession for most subjects[17]. Varicose veins harmed their daily activities, with approximately 30% of affected individuals experiencing induration, inflammation, and active ulcers, all of which significantly affected their quality of life[17,18].

To manage varicose veins, teachers can adopt various self-care measures to alleviate discomfort and reduce the risk of further complications[19]. Firstly, they should avoid wearing high-heeled footwear and opt for comfortable, supportive shoes to promote better blood circulation. Secondly, teachers should be mindful of taking regular breaks and avoiding prolonged periods of sitting or standing, as changing positions frequently can help improve venous blood flow[20]. Light exercises like walking or stretching during breaks can also promote healthy blood circulation[21].

Furthermore, maintaining a healthy weight through a balanced diet and regular physical activity can positively impact varicose vein management. Elevating the legs while resting can help reduce swelling and discomfort[22]. Teachers may also benefit from wearing compression stockings, which provide gentle pressure on the legs and aid in keeping the blood flowing toward the heart[23].

Educating teachers about these self-care measures and encouraging them to prioritize their vein health can lead to better management and improved quality of life despite the challenges posed by varicose veins[23,24].

The study's limitations included data collection from a small population and the use of an online platform, potentially reducing subject examination and engagement. Reaching sure participants without internet access posed difficulties. Future research should consider

increasing the sample size and including clinical analysis alongside the questionnaire-based approach to address these limitations[25]. Employing face-to-face interactive response collection methods could provide more in-depth insights. As recommendations, teachers should be advised to avoid high heel footwear and prolonged sitting or standing. Encouraging varied teaching positions, maintaining a healthy weight, and following a balanced diet can improve vein health and reduce the risk of varicose veins. Implementing these suggestions and recommendations can help mitigate the impact of varicose veins on teachers' well-being and improve their overall health and quality of life.

Conclusion

In conclusion, the study found a high prevalence of varicose veins among teachers, with 54.4% of teachers aged 25 to 55 affected. Approximately 30% reported a negative impact on their quality of life. Female teachers appeared more susceptible, possibly due to hormonal changes during their reproductive years. These findings underscore the importance of raising awareness about the condition and implementing measures to support the well-being of teachers in the education system.

References

1. UK NC. Varicose Veins in the Legs: *The Diagnosis and Management of Varicose Veins*.
2. Mukunda NK. Clinical evaluation and management of lower limb varicose veins: A study at KIMS. Unpublished doctoral dissertation submitted to Rajiv Gandhi University of Health Sciences. 2006.
3. Beebe-Dimmer JL, Pfeifer JR, Engle JS, Schottenfeld D. The epidemiology of chronic venous insufficiency and varicose veins. *Annals of epidemiology*. 2005 Mar 1;15(3):175-84.
4. Caggiati A, Bergan JJ, Gloviczki P, Jantet G, Wendell-Smith CP, Partsch H. An *International Interdisciplinary Consensus Committee on Venous Anatomical Terminology*. Nomenclature of the veins of the lower limbs: an international interdisciplinary consensus statement. J Vasc Surg. 2002 Aug 1;36(2):416-22.
5. Lin F, Zhang S, Sun Y, Ren S, Liu P. The management of varicose veins. *International surgery*. 2015 Jan;100(1):185-9.

6. Lin JC, Mclaughlin D, Zurawski D, Kennedy N, Kabbani L. Comparison of virtual visit versus traditional clinic for management of varicose veins. *Journal of Telemedicine and Telecare*. 2020 Jan;26(1-2):100-4.
7. Liu P, Ren S, Yang Y, Liu J, Ye Z, Lin F. Intravenous catheter-guided laser ablation: a novel alternative for branch varicose veins. *International surgery*. 2011 Oct;96(4):331-6.
8. Lin SD, Chang KP, Lu DK, Lee SS, Lin TM, Tsai CC, Lai CS. Endoscope-assisted management of varicose veins in the posterior thigh, popliteal fossa, and calf area. Annals of plastic surgery. 2002 Jan 1;48(1):10-20.
9. Jones RH, Carek PJ. Management of varicose veins. American family physician. 2008 Dec 1;78(11):1289-94.
10. Lin YN, Hsieh TY, Huang SH, Liu CM, Chang KP, Lin SD. Management of venous ulcers according to their anatomical relationship with varicose veins. Phlebology. 2018 Feb;33(1):44-52.
11. Passman MA, McLafferty RB, Lentz MF, Nagre SB, Iafrati MD, Bohannon WT, Moore CM, Heller JA, Schneider JR, Lohr JM, Caprini JA. Validation of venous clinical severity score (VCSS) with other venous severity assessment tools from the American venous forum, national venous screening program. *Journal of vascular surgery*. 2011 Dec 1;54(6):2S-9S.
12. Lin SD, Chang KP, Yang YL, Lee SS, Lin TM, Tsai CC, Lai CS. Gross anatomy of primary varicose veins observed in endoscopic surgery. *Annals of plastic surgery*. 2002 Dec 1;49(6):559-66.
13. Dalboh A, Alshehri NA, Alrafie AA, Bakri KA. Prevalence and awareness of varicose veins among teachers in Abha, Saudi Arabia. *Journal of Family Medicine and Primary Care.* 2020 Sep;9(9):4784.
14. Lin SD, Lin TM, Lee SS, Yang YL, Sun IF, Lai CS. Endoscope-assisted management of primary varicose veins below the knee. Phlebology. 2005 Dec 1;20(4):163-9.
15. Lin SD, Cheng KH, Lin TM, Chang KP, Lee SS, Sun IF, Wang WH, Lai CS. Management of the primary varicose veins with venous ulceration with assistance of endoscopic surgery. Annals of plastic surgery. 2006 Mar 1;56(3):289-94.
16. Sadat U, Gaunt M. Current management of varicose veins. *British Journal of Hospital Medicine* (2005). 2008 Apr;69(4):214-7.

17. Kalinin RE, Suchkov IA, Laut MV, Mzhavanadze ND, Shanaev IN. Varicose veins: a local or systemic hemodynamic disorder. *Journal of Diagnostic Medical Sonography*. 2020 Jul;36(4):328-34.
18. Joseph N, Abhishai B, Thouseef MF, Abna A, Juneja I. A multicenter review of epidemiology and management of varicose veins for national guidance. Annals of medicine and surgery. 2016 Jun 1;8:21-7.
19. Ali AL, Kotb SA, Osman SR. Prevalence of Varicose Veins Among Secondary Schools' Teachers in Assiut Governorate. *Assiut Scientific Nursing Journal*. 2019 Dec 1;7(19):142-50.
20. Kamceva G, Kamcev-Panova L. Long and permanent standing of the teachers is one of the factors for the appearance of varicose veins on the lower limbs. Knowledge-*International Journal, Scientific Papers*. 2018.
21. Kulkarni S, Nandagave G, Kokare S, Pawar R, Dongare H, Meshram T, Goted R. A Descriptive Study to Assess the Knowledge Regarding Varicose Veins among Teachers in Selected Primary Schools. *International Journal of Medical Surgical Nursing*. 2020 Jun 2;3(1):7-12.
22. Savithri KB, Rani R. A Study to Assess the Effectiveness of Structure Teaching Program on Knowledge Regarding Prevention and Management of Varicose veins among School Teachers at Private Schools, Chennai. Int J Health Sci Res. 2020. June. 10: (6): 116—122.
23. Ni X, Huang Q, Tan L. The impact of lack of disease awareness on the experience of primary varicose veins. Journal of Vascular Nursing. 2019 Dec 1;37(4):257-63.
24. Chong EY, Chan AH. Subjective health complaints of teachers from primary and secondary schools in Hong Kong. *International journal of occupational safety and ergonomics*. 2010 Jan 1;16(1):23-39.
25. De Silva PV. Occupational health problems, life style and occupational risk factors associated with burnout among female primary school teachers in the Southern Province of Sri Lanka. MD Thesis (Community Medicine). Colombo: *Post Graduate Institute of Medicine*, 2007.