



Original Article

Prevalence of Varicose Veins and Quality of Life among Security Guards

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ABSTRACT

Varicose vein is a condition of lower limbs which is caused by distension and swelling of veins leading towards back flow and accumulation of blood in limbs. **Objective:** To find out the prevalence of varicose veins and quality of life among the security guards of Lahore. **Methods:** Data were collected from the 210 security guards of public areas of Lahore, using convenient sampling. Both male and female security guards 35-70 years with at least 6 duty hours and having more than 1 year of experience were included while; security guards with chronic diseases, history of trauma and amputated lower limbs were excluded. Perthe's test and Brodie-Trendelenburg Test were applied to rule out the VV and Aberdeen's Varicose Veins Questionnaire (AVVQ) was used to evaluate the quality of life. SPSS 26.0 was used to compute the results. **Results:** Mean age of the security guards was 44.661 ± 7.315 years. Females were 8(3.8%) and males were 202 (96.2%). Majority 204 (97.1%) of participants had 7 to 10 duty hours. Brodie-Trendelenburg test shows positive response in 18(8.6%) participants for their right leg and 16 (7.6%) for left leg. While, Perthes test was positive in 16(7.6%) participants for left leg, whereas 17 (8.1%) for right leg. Prevalence of varicose veins in security guards was found 8%. Majority of participants 199(94.8%) presented good quality of life while, 11(5.2%) reflected moderate quality of life. **Conclusions:** The prevalence of varicose veins among security guards of Lahore was low. The quality of life was good in the majority of the security guards.

INTRODUCTION

Varicose veins are a condition affecting the lower limbs, characterized by the distension and swelling of veins due to the malfunction or failure of the valves within them. This leads to blood backflow and accumulation in the limbs. Superficial thrombophlebitis may develop, potentially causing prolonged bleeding. Patients with varicose veins often experience tenderness due to venous distension [1]. Female-to-male ratio of varicose veins is 3:1. However, other studies have reported a higher prevalence in males. Varicose veins are more common in developed and industrialized countries compared to underdeveloped ones [2]. Common symptoms include visible twisted veins, leg cramps, heaviness, swelling, pain, and fatigue [3]. In

2022, Aslam MR et al., conducted a global study on the development of varicose veins, including its epidemiology and contributing factors. They found that the prevalence of varicose veins varies worldwide, with a rate of 16-20% in Pakistan [4]. Risk factors for varicose veins include age, gender, family history, occupation, pregnancy, Body Mass Index (BMI), and obesity. People over 65, women, those with a family history of the condition, individuals in long-standing occupations like teaching and security, pregnant women, and those with higher BMI or obesity are at increased risk [4]. Other high-risk groups include the elderly, overweight individuals, those lifting heavy objects, pregnant women or those at menopause, and people

consuming low dietary fiber [5]. Security guards are particularly prone to varicose veins due to prolonged standing hours and higher BMI. Signs of varicose veins include spider veins, leg or ankle swelling, lumps in leg veins, skin discoloration, eczema, ulcers, pale ulcers, pain in touchable veins, leg scars, and increased temperature [6]. Doppler ultrasonography is recommended to check for venous reflux. If unavailable, the Brodie-Trendelenburg and Perthe's tests are effective alternatives for diagnosis due to their high sensitivity [7-9]. Security guards, who often belong to low-income professions and endure prolonged standing, may not prioritize their health until it becomes a serious issue.

Our study focused on examining the prevalence of varicose veins among security guards and how this condition affects their quality of life. This information could be useful in developing a prognostic criterion before the condition becomes severe. The objective of the study was to determine the prevalence of varicose veins and assess the quality of life among security guards in Lahore.

METHODS

This Descriptive cross-sectional study was conducted after ethical permission reference no. (Case no. 626/ERC/CMH/LMC) in four months (September to December 2023), on the security guards of public areas (universities, banks, schools, markets and hospitals) of Lahore. The sample size was estimated using WHO calculator, utilizing the findings of a previous study with 95% confidence interval and was found 210 participants [10]. Non-probability convenient sampling technique was used to meet the sample size. Companies providing security guards to different institutions was formally approached and with their assistance the security guards were approached at their duty sites of both gender ranging from age 35-70 years, having at least 6 hours per day duty timings and having more than 1 year of experience as a security guard were included while, security guards with other chronic diseases, with the history of trauma or with amputated lower limbs, pregnant females or post-menopausal lady guards were excluded. Before the data collection consent were taken and interview was conducted after explaining the whole procedure. Varicose Veins were subjectively confirmed by application of Perthe's Test (Sensitivity 0.97% and Specificity 0.20%) and Brodie Trendelenburg Test (1) (Sensitivity 0.91% and Specificity 0.15%) (Figures 1: A & B). The Brodie-Trendelenburg test is useful for diagnosing varicose veins

and determining whether the reflux is superficial or deep. The test involves having the patient lie down and elevate their leg to empty the veins. A tourniquet is then applied, and the filling time is observed when the patient stands up [1]. Quality of life was studied using Aberdeen's Varicose Veins Questionnaire (AVVQ) which has a high test (99%) and Retest (97%) validity [11]. AVVQ is a 13-item questionnaire, its score ranging from 0 to 100 points, with 0 points indicating the best possible quality of life. The data were entered through SPSS version 26.0 and descriptive analysis for baseline and demographic characteristics was done. Covariate analysis for association between Perthe's test, brodie-Trendelenburg test and BMI and quality of life on the basis of scores of AVVQ was done through chi square test ($p < 0.05$ as significant).



Figure 1: Perthes Test Performance and Brodie Trendelenburg Test Performance

RESULTS

The mean age of security guards was 44.66 ± 7.316 . 133 (63.3%) security guards had a normal BMI. 204 (97%) security guards working for 7-12 duty hours. Demographics including gender, age, working experience in years, Body Mass Index (BMI) and duty hours were given as table 1. Results of Perthe's test and Brodie-Trendelenburg's test were given as figure 2. The quality of life on the basis of scoring of Aberdeen's Varicose Vein Questionnaire (AVVQ) was good in 83.33% of security guards.

Table 1: Demographics Characteristics of the Participants (n=210)

Variables	Categories	N (%)
Gender		
Male	-	202 (96.19%)
Female	-	8 (3.81%)
Age Group (Years)		
Mean ± SD	44.66 ± 7.316	
Min-Max	35-65 Years	
Range	35-40	72 (34.3)
	41-45	72 (34.3)
	46-50	28 (13.3)
	51-55	49 (23.3)
	55-60	13 (6.2)
	61-65	1(0.5)
Working Experience (Years)	01-5 Years	103 (49.0)
	06-10 Years	65 (31.0)
	11-15 Years	17 (8.1)
	16-20 Years	13 (6.2)
	>20	12 (5.7)
BMI (Kg/m ²)	Underweight (<18.5)	7 (3.3)
	Normal weight (18.5-24.9)	133 (63.3)
	Overweight (25-29.9)	56 (26.7)
	Obesity (>30)	14 (6.7)
Duty Hours	1-6	6 (2.9)
	7-12	204 (97.1)
Total		210 (100)

Figure 2 showed that when performing Brodie-Trendelenburg test, 192 (91.4%) security guards showed negative results while 18 (8.6%) showed positive result for right leg. In Perthes test, 193 (91.9%) security guards showed negative results while 17(8.1%) show positive result for right leg. 194 (92.4%) security guards show negative results, while 16 (7.6%) security guards show positive results for both-Trendelenburg test and Perthes in left leg.

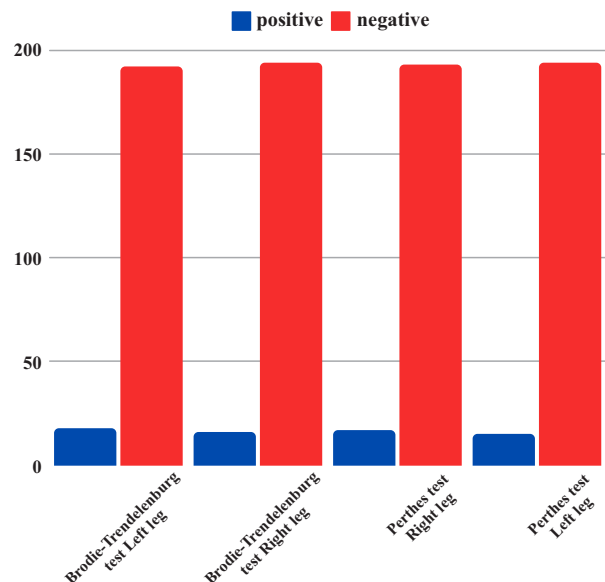


Figure 2: Results of Physical Test of Both Legs in Security Guards
 In table 2, the positive response for Brodie-Trendelenburg test in right leg, 18 participants out of which 10 (55.6%) participants were of normal weight, 6 (33.3%) participants were overweight and 2 (11.1%) participants are obese. Their p value is 0.625 and Cramer's V is 0.091. In left leg both Brodie-Trendelenburg and Perthes test showed positive response in 16 (100%) participants, out of which 9 (56.3%) participants were of normal weight, 6 (37.5%) was overweight and 1 (6.3%) participant was obese. Their p value is 0.687 and Cramer's V is 0.084. Perthes test of right leg showed negative response in 193 participants and positive response in 17 participants, out of 210 (100%). Positive response was shown in 10 (58.8%) participants with normal weight, 5 (29.4%) overweight participants and 2 (11.8%) obese participants. Their p value is 0.694 and Cramer value is 0.083.

Table 2: Association Between the Brodie-Trendelenburg Test and Perthe's Test in Both Leg and Bmi(Kg/M²)

Variables	Response	BMI (Kg/m ²)				Total N (%)	chi-Square N (%)	p-Value N (%)	Cramer's V N (%)
		Underweight (<18.5) N (%)	Normal Weight (18.5-24.9) N (%)	Overweight (25-29.9) N (%)	Obesity (>30) N (%)				
Brodie-Trendelenburg Test of Right Leg	-ve	7 (3.6)	123 (64.1)	50 (26)	12 (6.3)	192 (100)	1.756	0.625	0.091
	+ve	0 (0)	10 (55.6)	6 (33.3)	2 (11.1)	18 (100)			
Brodie-Trendelenburg Test of Left Leg	-ve	7 (3.6)	124 (63.9)	50 (25.8)	13 (6.7)	194 (100)	1.481	0.687	0.084
	+ve	0 (0)	9 (56.3)	6 (37.5)	1 (6.3)	16 (100)			
Perthe's Test of Right Leg	-ve	7 (3.6)	123 (63.7)	51 (26.4)	12 (6.2)	193 (100)	1.449	0.694	0.083
	+ve	0 (0)	10 (58.8)	5 (29.4)	2 (11.8)	17 (100)			
Perthe's Test of Left Leg	-ve	7 (3.6)	124 (63.9)	50 (25.8)	13 (6.7)	194 (100)	1.481	0.687	0.084
	+ve	0 (0)	9 (56.3)	6 (37.5)	1 (6.3)	16 (100)			
Total		7 (3.3)	133 (63.3)	56 (26.7)	14 (6.7)	210 (100)	-	-	-

In table 3, Brodie-Trendelenburg test of right leg showed r value of 0.462 with a positive response in 18 participants out of 210 (100%) where 11 (61.1%) and 7 (38.9%) participants belonging to groups <34 (good) and 34-66 (moderate) quality of life respectively. The Brodie-Trendelenburg test and Perthe's test in left leg is in 7(43.8%) and 9(56.3%) participants belonging to groups <34 (good) and 34-66 (moderate) quality of life respectively in 16 participants out of 210 (100%), who showed up with positive results. Their r value is 0.658. Perthe's test of right leg showed r value of 0.4 with a positive response in total 17

participants, where 11(64.7%) and 6(35.3%) belonged to groups <34 (good) and 34-66 (moderate) quality of life respectively. P value is significant for both tests in both legs.

Table 3: Association Between Brodie-Trendelenburg Test and Perthe's Test with Quality of Life

Variables	Response	Quality of Life		Total N (%)	chi-Square	p-Value	Spearman Correlation Coefficient (r)
		<34 (Good) N (%)	34-66 (Moderate) N (%)				
Brodie-Trendelenburg Test of Right Leg	-ve	188 (97.9)	4 (2.1)	192 (100)	44.913	<0.001*	0.462
	+ve	11 (61.1)	7 (38.9)	18 (100)			
Brodie-Trendelenburg Test of Left Leg	-ve	192 (99)	2 (1)	194 (100)	90.797	<0.001*	0.658
	+ve	7 (43.8)	9 (56.3)	16 (100)			
Perthe's Test of Right Leg	-ve	188 (97.4)	5 (2.6)	193 (100)	33.504	<0.001*	0.401
	+ve	11 (64.7)	6 (35.3)	17 (100)			
Perthe's Test of Left Leg	-ve	192 (99)	2 (1)	194 (100)	90.797	<0.001*	0.658
	+ve	7 (43.8)	9 (56.3)	16 (100)			
Total		199 (94.8)	11 (5.2)	210 (100)	-	-	-

DISCUSSION

The prevalence of the varicose veins in security guards is low. Ramyashree, et al., in 2022 conducted research about knowledge of varicose veins among 73 guards in a selected hospital in Mangalore India, where majority of the security guards (46.6%) were above 41 years, while 93% of them were males. The service years of majority these security guards were 1-5 years, while majority (83.6%) were standing during work and their working hours was 8 to 12 hours. However, no association was found between their knowledge and the selected demographic variables [12]. Most of current study's findings are similar to them with a difference in sample size. Moreover, the ratio of females was also low likewise the current study. A similar study was conducted in Bengaluru Karnataka, to assess the risk factors among traffic police personnel by Mohiddina DF et al., their sample included only 50 members and 60% of them had prolonged working hours, 38% of the sample population belonged to 50-59 years' age group. Though females are more vulnerable to develop VV than males owing to hormonal factors, but the present study involves only 2% female population, rest 98% being males [13]. The male to female ratio in both studies is almost comparable but their sample was smaller and population was different. Timilsina R et al., conducted a cross-sectional study on the assessment of risk for varicose veins among city police working in Belagavi city, Karnataka, in 2021. The participants provided clear consent and were thoroughly interviewed with the help of a questionnaire and observational techniques to determine the signs and symptoms. The study concluded that 14.7% of the police officers had varicose veins which showed an obvious association with their religion, designation, duration of working, income, marital status, lungs problem, DVT, cardiac infarct, and HTN. In association with marital status and prolonged standing, 20% of the participants were found at risk of developing varicose veins in their later age. Other possibilities due to which varicose veins may develop

are a diet that contain low fiber, genetically weaken vein walls, aging and females after menopause are at greater risk to get varicose veins. VV's can be prevented by raising the leg above the heart level and this should be done for quite a few minutes in a day. The COVID pandemic and ongoing election campaign at that time of study did not allow the researchers to perform the Doppler US due to which they missed first-stage cases of varicose veins [14]. The similarity is being the common limitation of not using the colored doppler US due to different reasons. It is seen that the prevalence of varicose veins varies with the side of the limb being examined. Two physical tests were performed on both limbs of all the individuals to assess the prevalence of the varicose vein. Out of 210 security guards, the Brodie-Trendelenburg test for right leg came out negative for majority (192) of the individuals with mean SD of 2.05 ± 8.45 with a t value -5.338 and p value is >0.001, while for the left leg it was 194 out of 210 with mean SD of 1.87 ± 7.56 with a t value -6.227 and p value is >0.001. Right leg has a higher number of positive tests results as compared to the left leg. Alghamdi DA et al., conducted a study in 2020 to elaborate the effects of varicose veins on quality of life of adult female patients in the Eastern region of Saudi Arabia. 128 female patients were included in the study that were aged 18 years or above. The majority (44.5%) of them were between the age group of 45 to 54 years. The body mass index (β=-0.304, t=-2.870, p=0.005), frequent constipation (β=-0.258, t=-2.870, p=0.009), and long rest periods during work (β=0.517, t=2.111, p=0.037) came out to be important predictors of quality of life [15]. The difference is that they included only females and they observed effects of VV on QOL to determine potential associations between demographic characteristics of these patients and their Quality of life, while in current study male population was dominant. Another study by Branisteanu DE et al., conducted on 1893 Romanian population, confirms that BMI was associated with the

severity of chronic venous disease for the female group in their study [16]. This finding validates the possible explanation of the poor QoL among obese individuals, as they may suffer from a more severe form of the disease. Ali AL et al., conducted a study in 2019 to evaluate the prevalence of varicose veins among secondary schools teachers. The findings of this study revealed that mean age of studied sample were 45.11 ± 9.09 and 41.4% of participants age ranged from 35- 44 years. Compared to current study where the mean age was 44 and average age group ranged from 35-40 years, this study is quite similar to ours in demographics. The outcome of the study was a high prevalence of varicose veins among secondary schools' teacher while our study showed low prevalence of varicose veins among security guards [17]. The current study has shown association of the quality of life with prevalence of varicose veins in both sides of limbs after performing Brodie-Trendelenburg and Perthes test. According to the study, 192 were tested negative for Brodie-Trendelenburg test in the right leg. In these 192 individuals, 188 individuals have good quality of life while 4 individuals indicated moderate quality of life with a p value=0.001 and r value=0.462. For the positive participants.in Brodie-Trendelenburg test, the quality of life was good for 11 individuals and moderate for 7, out of 18 individuals in total. The number was quite same for the left leg of Brodie's Trendelenburg test members. The test results came out negative for 194 individuals out of which 192 had good quality of life while 2 had moderate quality of life with a p value=0.001 and r value=0.658. The test came positive for 16 members, out of which 7 had good quality of life and only 9 people had moderate quality of life. After evaluating the association of quality of life with Perthe's test, we can see that for the right leg 193 out of 210 members came out negative result with a p value=0.001 and r value=0.4. Out of 193 individuals, 188 members had good quality of life while 5 have shown moderate quality of life. For the positive members of the test, 11 out of 17 members have good quality of life while 6 had moderate quality of life. Similarly, in the left leg, 194 members came out negative out of which 192 had good quality of life and the remaining 2 had moderate quality of life with p=0.001 and r value=0.658. For the positive members of the Perthes test in the left leg, 7 out of 16 members had good quality of life while the other 9 had moderate quality of life. The above statistics indicate that quality of life is associated with prevalence of varicose veins as the members with positive test results of both tests in both limbs tend to 42 have moderate quality of life as compared to the negative members who have good quality of life. A similar study was conducted by Tan MK, et al., in year 2019 to assess the relationship between the diameter of the veins, clinical severity and quality of life. It was systematic review that included 9 cross sectional studies and a prospective cohort study. The available evidence suggests that while truncal venous diameters

have a weak positive correlation to clinical severity described using the CEAP classification or VCSS, they hold no relationship or predictive value of patients' HRQoL. This is in contrast to the significant relationships between clinical severity and HRQoL, with most studies showing correlation between clinical severity classification systems [18]. In an occupational setting, prolonged standing is closely associated with varicose veins. The workers most commonly affected are nurses, hairdressers, clerks, security guards, physical laborers, etc. [19]. The Clinical, Etiological, Anatomical, and Pathological CEAP classification divides varicose veins into seven clinical stages, ranging from C0 to C6, and is abbreviated as Clinical, Etiological, Anatomical, and Pathological Elements [20]. G. Aly S et al., in Cairo conducted a cross-sectional study on prevalence and associated risk factors of varicose vein among women with mean age 35.84 ± 9.14 years and standing hours during working days were 7.72 ± 2.54 days while in our study mean age was 44.66 ± 7.31 and duty hours were 1.97 ± 0.16 hours. In their study, 51.1% females were diagnosed with varicose veins by clinical examination and questionnaire while 8.1% security guards were diagnosed with varicose veins by physical tests and AVVQ. It shows women are at high risk of getting varicose veins rather than males [21]. Abou-EIWafa HS et al., conducted a cross sectional descriptive study among 201 nurses, specifically at a university in Egypt, showing prevalence of 18.4%. While our study conducted in public areas (hospital, office, market, bank) showing 8.1% prevalence among 210 security guards. Both studies show people having more duty hours are more prone to develop varicose veins [22]. Al Bader B et al., in 2020) found low prevalence in nurses in Riyadh [23]. Due to non-flexible duty hours of the security guards, it was challenging for researchers to access them thoroughly. Tests utilized for assessment cannot be conducted in open public areas and need a facility. The unavailability of a proper setting (cabins, coaches) for the performance of Brodie-Trendelenburg and Perthes test also came out as a limitation while conducting the research. Color Doppler is a gold standard tool for the diagnosis of VV, but due to financial and ethical limitations, researchers could not utilize that investigation for the study population. The importance of the study is that, with this investigation, many of the participants became aware of their health risks and requested for advice on how to prevent it from further progression.

CONCLUSIONS

The prevalence of varicose veins among security guards of Lahore was low. The quality of life was good in the majority of the security guards of Lahore.

Authors Contribution

Conceptualization: SA, HQ, WP, RA

Methodology: SA, HQ, RA, MBA, MH, AR

Formal analysis: AR

Writing, review and editing: SA, HQ, WP, RA

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

- [1] Youn YJ, Lee J. Chronic venous insufficiency and varicose veins of the lower extremities. *The Korean Journal of Internal Medicine*. 2019 Mar; 34(2): 269. doi: 10.3904/kjim.2018.230.
- [2] Eberhardt RT and Raffetto JD. Chronic venous insufficiency. *Circulation*. 2014 Jul; 130(4): 333-46. doi: 10.1161/CIRCULATIONAHA.113.006898.
- [3] Shernazarov F, Jalalova D, Azimov A, Azimova S. Causes, Symptoms, Appearance, Treatment Of Varicose Veins. *Science and Innovation*. 2022; 1(7): 416-22.
- [4] Aslam MR, Muhammad Asif H, Ahmad K, Jabbar S, Hayee A, Sagheer MS et al. Global impact and contributing factors in varicose vein disease development. *SAGE Open Medicine*. 2022 Aug; 10:20503121221118992. doi: 10.1177/20503121221118992.
- [5] Renitha K, Shashidhara YN, Nayak MG. Risk factors of varicose veins among security guards. *International Journal of Advanced Research*. 2015; 3(3): 669-74.
- [6] Busbaih Z, Saleh AA, Alsulaiman AH, Almuhanma MA, AlKhawajah SH, Alsuwayie SB. Risk assessment of varicose veins among teachers in Al-Ahsa, Saudi Arabia. *Cureus*. 2022 Jun; 14(6). doi: 10.7759/cureus.26125.
- [7] Song A, Suryadinata K, Yovita N. Acute Wound with Varicose Vein in Rural Setting: The Challenge and Importance of Comorbidity Management. *Clinical Medical Reviews and Case Reports*. 2021; 8(11): 374. doi: 10.23937/2378-3656.
- [8] Ilyas I, Ashfaq HB, ul Ain Q. Prevalence of Varicose Veins Among Teachers in Lahore, Pakistan. *Pakistan Journal of Physical Therapy*. 2021 Oct; 4(3). doi: 10.52229/pjpt.v4i3.1671.
- [9] Kamatchi K and NT RK. A Comparative Study to Analyse the Effectiveness of Aerobic Exercise versus Buerger's Exercise in Varicose Vein among Security Guards. 2022 Feb. doi: 10.36678/IJMAES.2022.V08I01.005.
- [10] Yun MJ, Kim YK, Kang DM, Kim JE, Ha WC, Jung KY et al. A study on prevalence and risk factors for varicose veins in nurses at a university hospital. *Safety and Health at Work*. 2018 Mar; 9(1): 79-83. doi: 10.1016/j.shaw.2017.08.005.
- [11] Klem TM, Sybrandy JE, Wittens CH, Bot ME. Reliability and validity of the dutch translated Aberdeen Varicose Vein Questionnaire. *European Journal of Vascular and Endovascular Surgery*. 2009 Feb; 37(2): 232-8. doi: 10.1016/j.ejvs.2008.08.025.
- [12] Ramyashree S, Lobo A, Varghese J, Baby N, Varghese S. Knowledge on Varicose Vein among Security Guards Working in a Selected Hospital, at Mangaluru. *Innovational: Journal of Nursing and Healthcare*. 2022; 5-8. doi: 10.31690/ijnh.2022.v08i01.002.
- [13] Mohiddina DF, Gopinath DM, Raja DS, Hafeez DM, Abbas DE, Nagaraj DE. Assessment of risk factors of varicose veins among traffic police personnel of Bengaluru, Karnataka. *International Journal of Advanced Research in Medicine*. 2021; 3: 87-9. doi: 10.22271/27069567.2021.v3.i1b.108.
- [14] Timilsina R, Prasad MR, Angolkar M, Patil N. Risk assessment for varicose veins among city police—a cross sectional study. *Clinical Epidemiology and Global Health*. 2021 Oct; 12: 100886. doi: 10.1016/j.cegh.2021.100886.
- [15] Alghamdi DA, Al-Shehri RH, Al-Qahtani MF. The effect of varicose veins on the quality of life of adult female patients in the eastern region of Saudi Arabia. *The Open Public Health Journal*. 2020 Dec; 13(1). doi: 10.2174/1874944502013010771.
- [16] Branisteanu DE, Feodor T, Baila S, Mitea IA, Vittos O. Impact of chronic venous disease on quality of life: Results of vein alarm study. *Experimental and Therapeutic Medicine*. 2019 Feb; 17(2): 1091-6. doi: 10.3892/etm.2018.7054.
- [17] Ali AL, Kotb SA, Bakr AH, Osman SR. Prevalence of varicose veins among secondary schools' teachers in assiut governorate. *Assiut Scientific Nursing Journal*. 2019 Dec; 7(19): 142-50. doi: 10.21608/asnj.2019.74133.
- [18] Tan MK, Sutanto SA, Onida S, Davies AH. The relationship between vein diameters, clinical severity, and quality of life: a systematic review. *European Journal of Vascular and Endovascular Surgery*. 2019 Jun; 57(6): 851-7. doi: 10.1016/j.ejvs.2019.01.024.
- [19] Joseph NM. Assess the Clinical Morbidities of Varicose Veins and its Risk Factors among Construction Workers in Bhubaneswar. *i-Manager's Journal on Nursing*. 2019 Jan; 9(1): 20. doi:10.26634/

- jnur.9.1.16101.
- [20] Afzal H, Amjad HA, Ashraf M, Saleem T, Bhatti L, Qadir N *et al.* Association of age and gender with the level of functional activities in patients with varicose veins. *Journal of Xi'an Shiyou University*. 2023 Jan; 19(01): 1231-1233.
- [21] G Aly S, M Wahdan M, H Ahmed D, F Ibrahim EE, M Abd ElHamid D. Varicose veins: prevalence and associated risk factors among women of childbearing age attending a primary health care unit in Cairo, Egypt. *The Egyptian Family Medicine Journal*. 2020 May; 4(1): 58-76. doi: 10.21608/efmj.2020.90201.
- [22] Abou-EIWafa HS, El-Metwaly AA, El-Gilany AH. Lower limb varicose veins among nurses: a single center cross-sectional study in Mansoura, Egypt. *Indian Journal of Occupational and Environmental Medicine*. 2020 Sep; 24(3): 172-7. doi: 10.4103/ijoem.IJOEM_264_19.
- [23] AlBader B, Sallam A, Moukaddem A, Alanazi K, Almohammed S, Aldabas H *et al.* Prevalence of varicose veins among nurses at different departments in a single tertiary care center in Riyadh. *Cureus*. 2020 Dec; 12(12). doi: 10.7759/cureus.12319.