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A Comparative Study of Risk Assessment Regarding Varicose Veins Among Nurses Working In Critical Care Units And Non-Critical Care Units From The Selected Hospitals In Goa

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ABSTRACT

Introduction: Varicose veins are a common venous disorder among nurses due to prolonged standing, heavy workload, and limited rest. Early symptoms often go unnoticed, increasing progression risk. This study evaluates and compares varicose vein risk among Critical Care and Non-Critical Care nurses while examining demographic and occupational contributors influencing venous health.

Methods: A quantitative, descriptive, exploratory design was used among 230 nurses from four multispecialty hospitals in Goa. Convenience sampling included 115 Critical Care and 115 Non-Critical Care nurses. Data were gathered using a risk-factor checklist and Modified VCSS through self-reporting and observation. Analysis employed descriptive statistics, unpaired t-test, ANOVA, and Pearson's correlation.

Results: There was no significant difference in overall risk scores between groups ($t=1.49$, $p>0.05$). Marital status, pregnancy history, and constipation showed significant associations with higher risk. Weight and BMI demonstrated weak positive correlations with venous risk, while height showed none. Mild symptoms like pain, heaviness, and burning were most commonly reported.

Conclusion: Venous risk among nurses is influenced more by occupational and lifestyle factors than specific work settings. Early symptoms were prevalent across groups, indicating potential progression if unaddressed. Preventive measures including compression therapy, ergonomic adjustments, regular activity, and lifestyle awareness are essential to reduce chronic venous complications and promote vascular health in nursing professionals.

KEYWORDS: Body Mass Index, Constipation, Critical Care Nurses, Modified VCSS, Non-Critical Care Nurses, Risk Factors, Varicose Veins.

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INTRODUCTION

Varicose veins are a prevalent chronic venous disorder marked by dilated, tortuous veins caused by valve incompetence and impaired blood flow. Though often considered cosmetic, they can lead to pain, heaviness, cramps, edema, pigmentation, and long-term complications such as venous ulcers. [(1)] Nurses are particularly vulnerable due to prolonged standing, walking, and physically demanding duties, making venous disorders a growing concern in healthcare settings. [(2)]

Both Critical Care and Non-Critical Care nurses face strenuous work conditions that increase venous insufficiency risk. Critical Care nurses frequently endure extended shifts with restricted mobility, while Non-Critical Care nurses manage patient handling and long standing hours. [(3)] Early symptoms like pain, heaviness, and mild edema often go unnoticed, allowing progression to advanced venous disease. Despite high exposure, venous issues in nurses remain under recognized and underreported. [(4)]

Demographic and lifestyle factors further elevate risk, including female gender, pregnancy history, higher BMI, and constipation. Even among young nurses aged 21–30 years, early venous symptoms were evident, highlighting the strong influence of occupational strain over age. [(5)] Limited use of preventive measures such as compression stockings or leg elevation indicates a gap in awareness. Assessing venous risk among nurses is crucial for early detection, prevention, and development of targeted workplace strategies to promote vascular health across nursing units. [(6)]

The aim of the study was to assess and compare the risk of varicose veins among nurses working in Critical Care and Non-Critical Care units in selected hospitals of Goa. The objectives included identifying the contributing risk factors associated with varicose veins among nurses in both units, assessing the severity of symptoms using the Modified Venous Clinical Severity Score (VCSS), comparing the risk assessment scores between Critical Care and Non-Critical Care nurses, and determining the association between selected demographic variables such as age, marital status, BMI, pregnancy history, constipation, and mode of travel with the risk of developing varicose veins. [(7)]

MATERIALS AND METHODS

Study Design and Approach

A quantitative, descriptive, and exploratory research design was adopted to assess the risk of varicose veins among nurses working in Critical Care and Non-Critical Care units in selected hospitals of Goa. A non-experimental survey design enabled collection of data on risk factors, symptoms, and severity. [8]

Study Setting

The study was conducted in four private multispecialty hospitals in Goa: Vision Multispeciality Hospital (Mapusa), Redkar Hospital and Research Center (Dhargal), Savaikar Hospital and Research Center (Ponda), and Dr. Kolwalkar's Galaxy Hospital (Mapusa). Participants were nurses from Critical Care areas (ICU, NICU, PICU, CCU, Trauma Unit, Operation Theatres) and Non-Critical Care units (medical, surgical, obstetric, pediatric wards, and OPDs).

Population and Sample

The target population comprised all nurses working in the selected hospitals. Using Non-Probability Convenience Sampling, 230 nurses were included: 115 Critical Care nurses and 115 Non-Critical Care nurses.

Eligibility Criteria

Inclusion: Registered nurses providing direct care and willing to participate with written consent.

Exclusion: Not explicitly stated.

Study Instruments

Two tools were used:

Tool 1: Inventory Checklist comprising demographic variables (age, gender, height, weight, education, marital status, experience, residence, travel mode) and contributing factors (BMI, family history, health ailments, pregnancy details, precautionary measures, contraceptive use, standing hours, constipation). [9]

Tool 2: Modified Venous Clinical Severity Score (VCSS), assessing pain, heaviness, burning, cramps, itching, varicosities, edema, pigmentation, inflammation, induration, ulcers, and compression therapy. [10]

Technique, Validity, and Reliability [11]

Data were collected through self-reporting and direct observation (10–15 minutes per participant). Content validity was established by ten experts, and reliability testing on 30 nurses yielded Cronbach's alpha of 0.857. [12]

Pilot Study

A pilot study conducted from 10–16 January 2022 on 30 nurses confirmed feasibility and informed tool refinement. [13]

Data Collection Procedure

After obtaining administrative permissions, eligible nurses were approached, consent obtained, and assessments conducted privately in duty rooms. Nurses completed the checklist followed by VCSS evaluation. Data collection occurred from 18 January to 12 February 2022. [14]

Data Analysis

Descriptive statistics were used for demographic and risk factor distribution. Inferential statistics included unpaired t-test for comparing groups, ANOVA for demographic variations, and Pearson's correlation for relationships among selected variables. Results were presented through tables and graphs. [15]

OBSERVATIONS AND RESULTS / ANALYSIS AND INTERPRETATION OF DATA

Tool 1: Inventory Checklist for Contributing Risk Factors

This tool consisted of two sections:

SECTION I: Demographic Characteristics

TABLE 1: Distribution of critical care nurses and non-critical care nurses with regard to their demographic data (N=230)

Particulars	Category	Critical Care Nurses (N=115) *f (%)*	Non-Critical Care Nurses (N=115) *f (%)*
Age (in years)	21–30	62 (27.0%)	83 (36.1%)
	31–40	37 (16.1%)	24 (10.4%)
	41–50	16 (7.0%)	8 (3.5%)
Gender	Female	113 (49.1%)	113 (49.1%)
	Male	2 (0.9%)	2 (0.9%)
Education	BSc Nursing	38 (16.5%)	48 (20.9%)
	GNM Nursing	53 (23.0%)	42 (18.3%)
	ANM Nursing	24 (10.4%)	25 (10.9%)
Marital Status	Unmarried	55 (23.9%)	64 (27.8%)

	Married	60 (26.1%)	51 (22.2%)
Years of Experience	0–5 years	38 (16.0%)	67 (29.1%)
	6–10 years	39 (17.0%)	40 (17.4%)
	11–15 years	30 (13.0%)	8 (3.5%)
	16–20 years	5 (2.2%)	0 (0.0%)
	21–25 years	2 (0.9%)	0 (0.0%)
	26–30 years	1 (0.4%)	0 (0.0%)
Mode of Travel	Walking	27 (11.7%)	30 (13.0%)
	Public Transport	44 (19.1%)	47 (20.4%)
	Private Transport	44 (19.1%)	38 (16.5%)

The socio-demographic profile of the participants shows that the largest proportion of nurses in both groups belonged to the 21–30 years age category, comprising 27.0% of critical care nurses and 36.1% of non-critical care nurses. Females overwhelmingly dominated both groups (49.1%). Regarding educational qualifications, GNM was most common among critical care nurses (23.0%), whereas BSc Nursing was more frequent among non-critical care nurses (20.9%). A higher percentage of non-critical care nurses (29.1%) had 0–5 years of experience compared to critical care nurses (16.0%), who were more evenly distributed across higher experience categories, including small proportions with over 20 years. Marital status distribution showed that married nurses were slightly more prevalent in the critical care group (26.1%), while unmarried nurses were more common in the non-critical care group (27.8%). In terms of mode of travel, both groups predominantly depended on public or private transport, with walking being the least preferred option.

SECTION II: Reported Contributing Risk Factors

Body Mass Index (BMI)

Most nurses in both groups had a normal BMI, with a slightly higher proportion among non-critical care nurses. Overweight status was more common in critical care nurses, while obesity remained minimal in both groups.

Family history of varicose veins

A small proportion of participants reported a family history of varicose veins, with slightly higher frequencies noted among non-critical care nurses for both paternal and maternal history.

Health Ailments

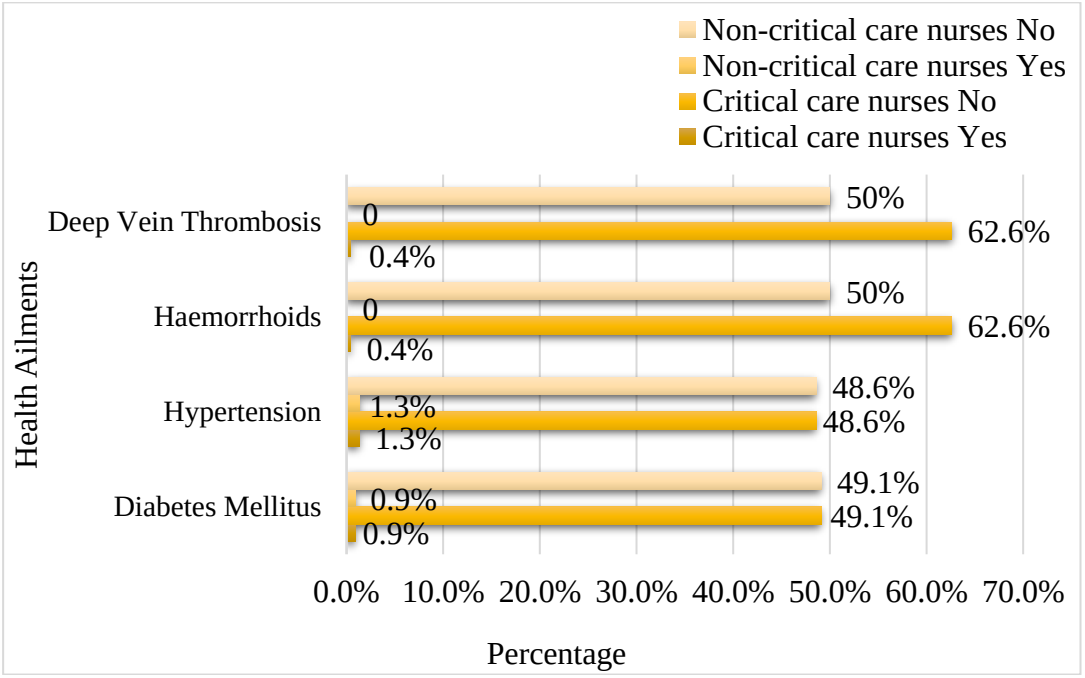

FIGURE 1: Nurses with regard to their health ailments

The graph shows that diabetes mellitus and hypertension are minimally present and equally distributed between both nursing groups. Haemorrhoids and deep vein thrombosis appear only among critical care nurses, though at very low rates (0.4%). Overall, most nurses in both groups reported no major health ailments.

Number of Pregnancies

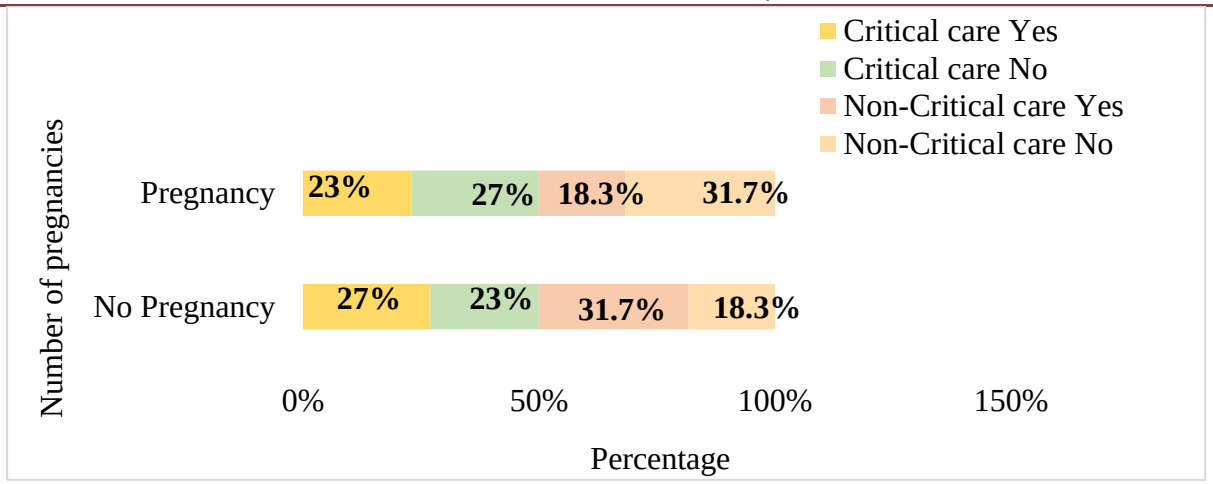

FIGURE 2: Nurses with regard to their number of pregnancies

The graph shows that pregnancy status differs slightly between the two groups. Among critical care nurses, 23% reported pregnancy and 27% reported no pregnancy, while non-critical care nurses showed a higher proportion of pregnancy (31.7%) compared to 18.3% with no pregnancy. Overall, non-critical care nurses had a greater prevalence of pregnancy than critical care nurses.

TABLE 2: Distribution of the nurses based on contributing risk factors of varicose veins (N=230)

Particulars	**Category**	**Critical Care Nurses (N = 115) *f (%)***	**Non-Critical Care Nurses (N = 115) *f (%)***
Precautionary Measures (1st Pregnancy)	Leg elevation	17 (7.4%)	14 (6.1%)
	Left lateral position	52 (22.6%)	39 (17.0%)
	Compression stockings	9 (3.9%)	4 (1.7%)
	Leg exercises	38 (16.5%)	30 (13.0%)
Precautionary Measures (2nd Pregnancy)	Leg elevation	11 (4.8%)	8 (3.5%)
	Left lateral position	26 (11.3%)	21 (9.1%)
	Compression stockings	6 (2.6%)	3 (1.3%)
	Leg exercises	21 (9.1%)	13 (5.7%)

Precautionary measures taken during first pregnancy

Critical care nurses reported higher adoption of precautionary measures such as left lateral positioning and leg exercises compared to non-critical care nurses. The use of compression stockings was low in both groups.

Precautionary measures taken during second pregnancy

Similar patterns were observed during second pregnancies, with critical care nurses more frequently practicing leg elevation, left lateral positioning, and leg exercises compared to non-critical care nurses.

Use of Oral Contraceptive Pills

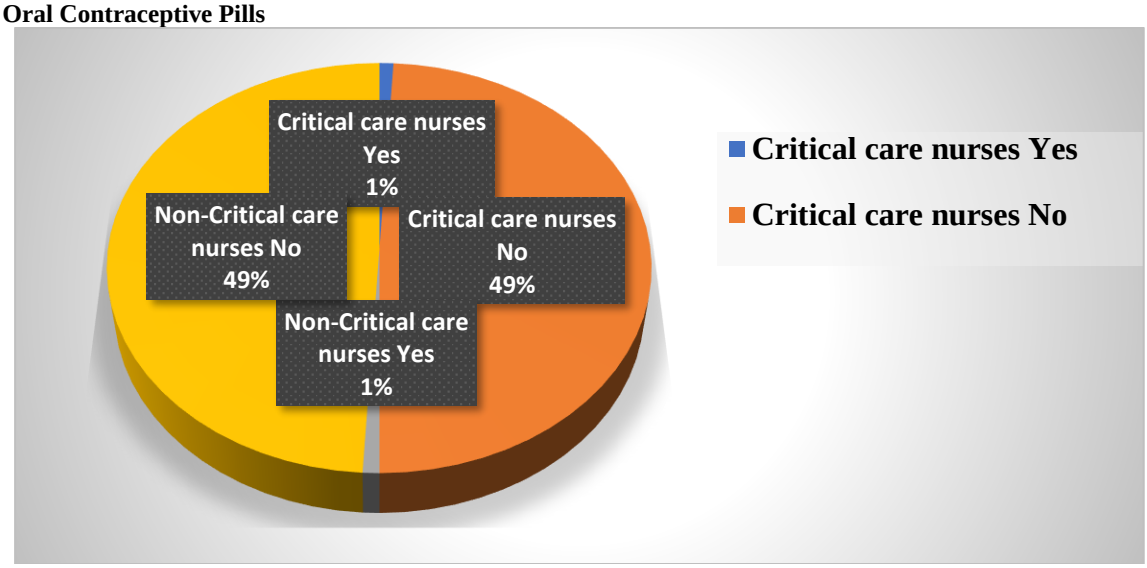

FIGURE 3: Critical care and non-critical care nurses with regard to use of contraceptive pills

The pie chart shows that only 1% of both critical care and non-critical care nurses reported using oral contraceptive pills, while the remaining 49% in each group reported non-use. Overall, the usage of oral contraceptive pills is very low and nearly identical across both groups.

Standing Hours at Work

All participants in both groups reported standing for more than six hours per day, indicating a high occupational physical burden among nurses regardless of department.

History of Constipation

A history of constipation was slightly more common among critical care nurses compared to non-critical care nurses.

Frequency of Constipation

Constipation occurring two or more times per week was reported more often by critical care nurses than non-critical care nurses.

Tool 2: Modified Risk Assessment Scale of Venous Clinical Severity Score (VCSS)

A five-point rating scale used to assess clinical severity in both lower limbs.

TABLE 3: Distribution of nurses based on modified venous clinical severity score (N=230)

Particulars	Category	Critical Care Nurses (N=115) f (%)	Non-Critical Care Nurses (N=115) f (%)
Pain – Right leg	Absent	28 (12.2%)	35 (15.2%)
	Mild	82 (35.7%)	77 (33.5%)
	Moderate	5 (2.2%)	3 (1.3%)
Pain – Left leg	Absent	36 (15.7%)	39 (17.0%)
	Mild	76 (33.0%)	74 (32.2%)
	Moderate	3 (1.3%)	2 (0.9%)
Heaviness – Right leg	Absent	14 (6.1%)	9 (3.9%)
	Mild	86 (37.4%)	93 (40.4%)
	Moderate	15 (6.5%)	13 (5.7%)
Heaviness – Left leg	Absent	14 (6.1%)	9 (3.9%)
	Mild	86 (37.4%)	93 (40.4%)
	Moderate	15 (6.5%)	13 (5.7%)
Burning – Right foot	Absent	51 (22.2%)	64 (27.8%)
	Mild	59 (25.7%)	39 (16.9%)
	Moderate	4 (1.7%)	10 (4.3%)
	Severe	1 (0.4%)	2 (0.9%)
Burning – Left foot	Absent	51 (22.2%)	64 (27.8%)
	Mild	59 (25.7%)	39 (16.9%)
	Moderate	4 (1.7%)	10 (4.3%)
	Severe	1 (0.4%)	2 (0.9%)
Muscle cramps – Right leg	Absent	20 (8.7%)	21 (9.1%)
	Mild	70 (30.5%)	74 (32.2%)
	Moderate	24 (10.4%)	20 (8.7%)
	Severe	1 (0.4%)	0 (0%)
Muscle cramps – Left leg	Absent	20 (8.7%)	21 (9.1%)
	Mild	70 (30.5%)	74 (32.2%)
	Moderate	24 (10.4%)	20 (8.7%)
	Severe	1 (0.4%)	0 (0%)
Itching – Right ankle	Absent	74 (32.2%)	78 (33.9%)
	Mild	37 (16.1%)	26 (11.4%)
	Moderate	4 (1.7%)	9 (3.9%)
	Severe	0 (0%)	2 (0.9%)
Itching – Left ankle	Absent	74 (32.2%)	78 (33.9%)
	Mild	37 (16.1%)	26 (11.4%)
	Moderate	4 (1.7%)	9 (3.9%)
	Severe	0 (0%)	2 (0.9%)

The prevalence of lower-limb symptoms was generally comparable between critical care and non-critical care nurses. Mild pain in both legs was the most frequently reported complaint in both groups, with slightly higher rates among critical care nurses. A similar pattern was observed for leg heaviness, where mild symptoms predominated, particularly among non-critical care nurses. Burning sensations in the feet were mostly absent, though mild symptoms were more common in critical care nurses, whereas moderate and severe symptoms were slightly higher in non-critical care nurses. Muscle cramps showed a comparable distribution in both groups, with mild symptoms being most common and severe cramps reported only among critical care nurses. Itching around the ankles was predominantly absent in both groups, though mild and moderate itching occurred slightly more often

among critical care nurses, while severe itching was noted only in the non-critical care group.

Varicose veins on the right and left leg

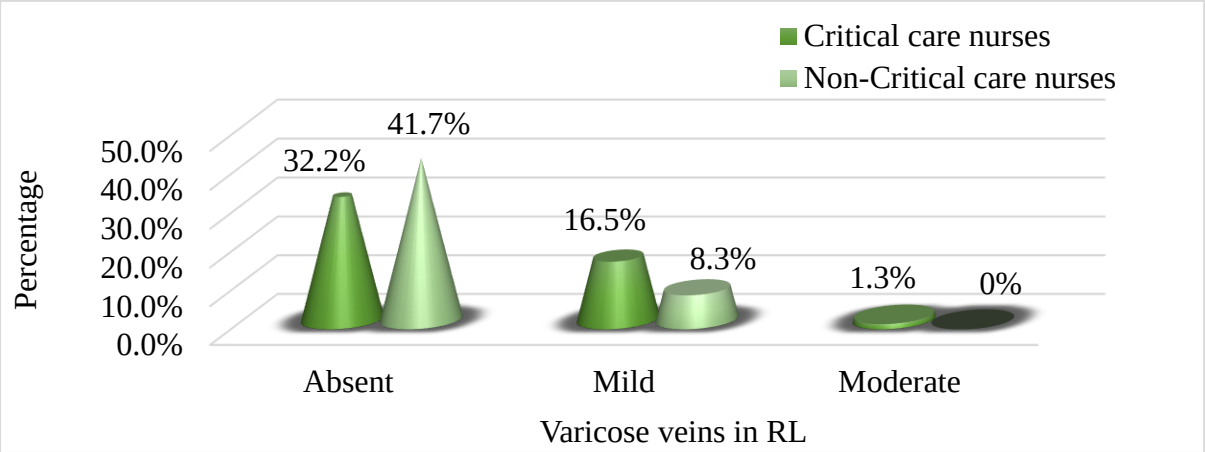

FIGURE 4: Nurses with regard to varicose veins in the right leg

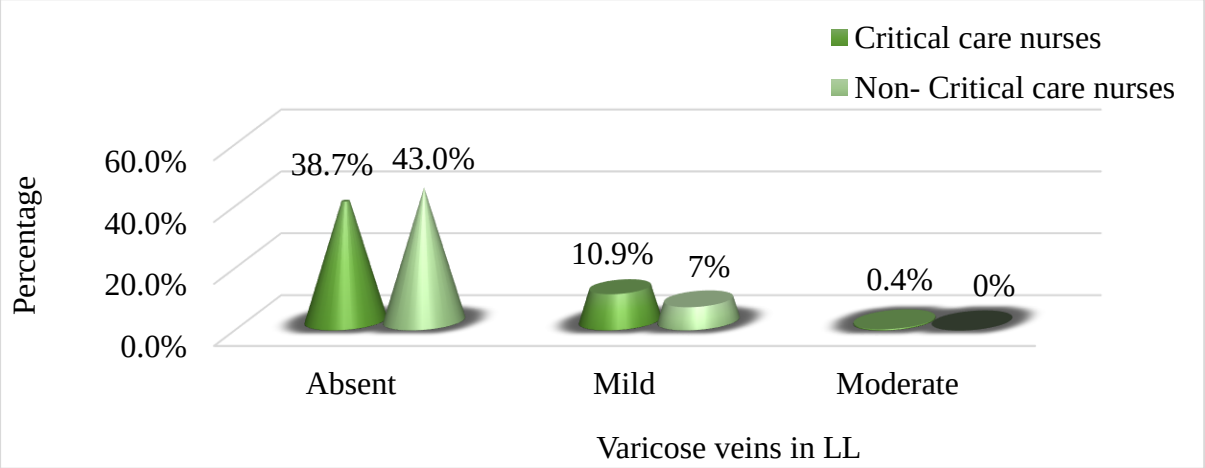

FIGURE 5: Nurses with regard to varicose veins in the left leg

The graphs show that most nurses in both groups had **no visible varicose veins** in either leg, with absence being slightly higher among non-critical care nurses. **Mild varicosities** were more common in critical care nurses than in non-critical care nurses for both right and left legs. **Moderate varicosities** were rare, reported only by a very small fraction of critical care nurses and none from non-critical care areas.

Venous edema on the right and left leg

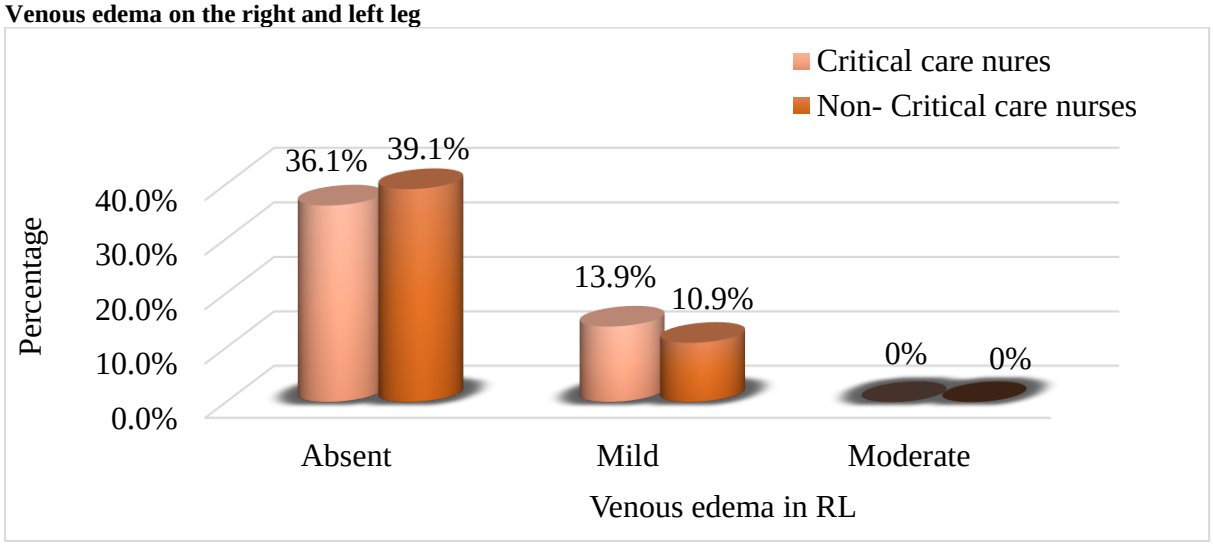

FIGURE 6: Nurses with regard to venous edema in the right leg

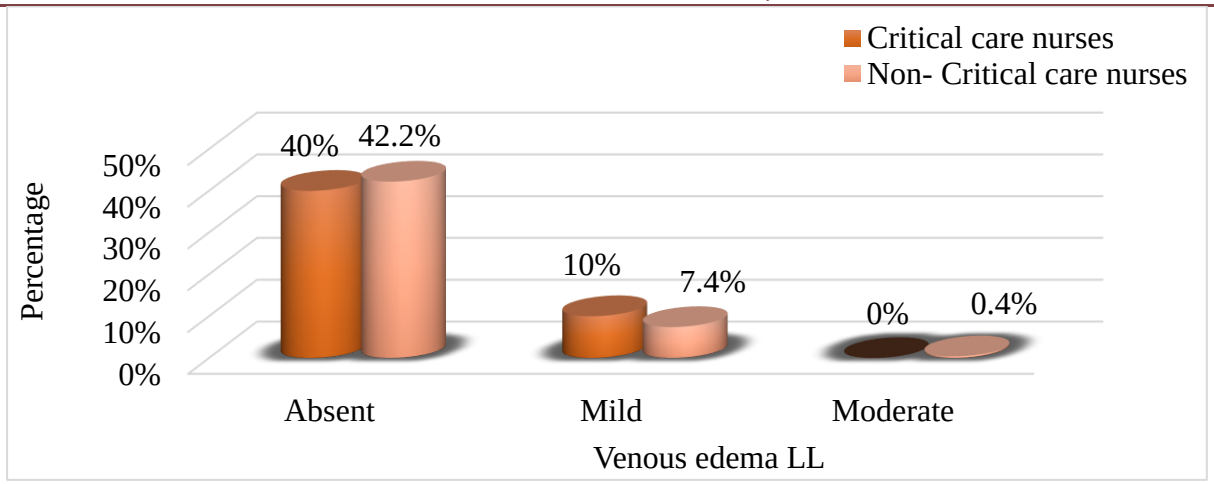

FIGURE 7: Nurses with regard to venous edema in the left leg

The graphs show the distribution of venous edema among nurses in both legs. In the right leg, venous edema was absent in the majority of Critical care nurses (36.1%) and Non-critical care nurses (39.1%), with mild edema reported by 13.9% and 10.9% respectively, and no cases of moderate edema in either group. Similarly, for the left leg, most nurses had no edema (40% Critical care; 42.2% Non-critical care), while mild edema occurred in 10% and 7.4% respectively. Only one Non-critical care nurse (0.4%) reported moderate edema, with none reported among Critical care nurses.

Pigmentation on the right and left leg

Out of 230 nurses, mild pigmentation due to varicose veins was observed in 6.5% of Critical care nurses and 3% of non-Critical care nurses on the right leg, while 2.6% and 1.7% respectively showed mild pigmentation on the left leg. Moderate pigmentation was reported in only one non-Critical care nurse (0.4%) on each leg.

Inflammation on the right and left leg

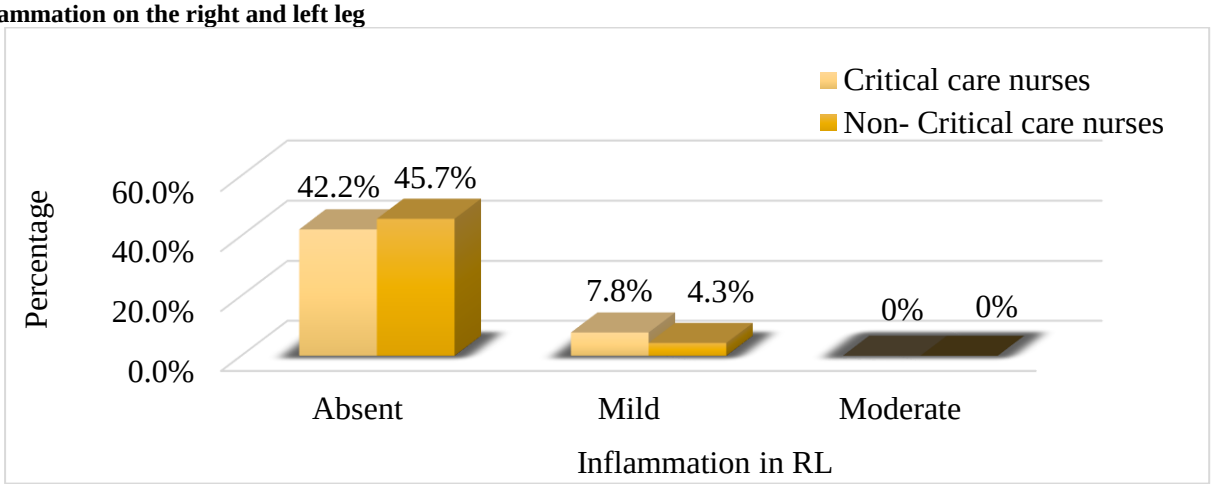

FIGURE 8: Nurses with regard to inflammation in the right leg

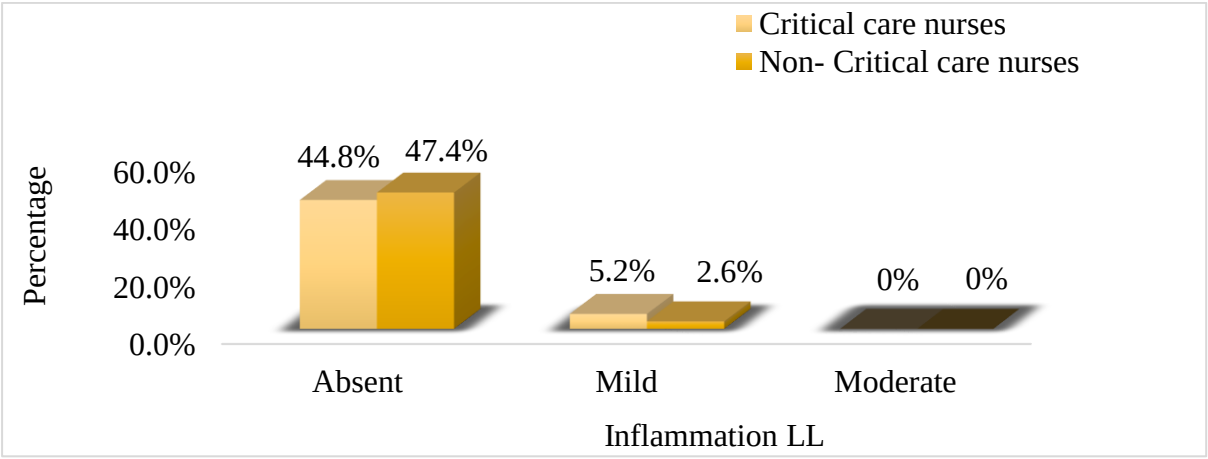

FIGURE 9: Nurses with regard to inflammation in the left leg

Inflammation was predominantly absent in both legs among nurses from critical and non-critical care areas. In the right leg, absence of inflammation was reported by 42.2% of critical care nurses and 45.7% of non-critical care nurses, while mild inflammation was noted in 7.8% and 4.3%, respectively, with no cases of moderate inflammation. Similarly, in the left leg, inflammation was absent in 44.8% of critical care nurses and 47.4% of non-critical care nurses, with mild inflammation observed in 5.2% and 2.6%, and no moderate cases in either group.

Compressive therapy for right and left leg

Mild use of compressive therapy was reported by 5.2% of critical care nurses and 1.3% of non-critical care nurses for the left leg, while moderate use was minimal (0.4% in both groups). Most nurses did not use compressive therapy (44.3% critical care, 48.3% non-critical care).

For the right leg, mild use was slightly higher (5.7% in critical care, 1.7% in non-critical care), with very limited moderate use (0.9% and 0.4%, respectively). The majority again reported no use (43.5% critical care, 47.8% non-critical care).

Data Analysis

TABLE 4: Comparison of the mean of risk assessment scores for varicose veins between nurses from critical care unit and non-critical care unit. (N=230)

Variables	N	M	SD	SDD	SED	t		Significance
						Calculated Value	Tabulated Value (0.05)	
Nurses from Critical Care Unit	115	9.49	5.01	5.04	0.66	1.49	1.65	Not Significant
Nurses from Non-Critical Care Unit	115	8.50	5.06					

(df=228)

Hypothesis

- **H_0:** There is no significant difference in the mean risk assessment scores of nurses working in Critical Care and Non-Critical Care units at the 0.05 level of significance.
- **H_1:** There is a significant difference in the mean risk assessment scores of nurses working in Critical Care and Non-Critical Care units at the 0.05 level of significance.

The mean risk assessment score for varicose veins among nurses in the Critical Care Unit was higher than that of nurses in the Non-Critical Care Unit. However, the calculated *t* value (1.49) was lower than the critical *t* value (1.65) at the 0.05 significance level with 228 degrees of freedom. Since the calculated value did not exceed the table value, the null hypothesis (H_0) was accepted and the alternative hypothesis (H_1) was rejected. This indicates that there is no statistically significant difference in the risk of varicose veins between nurses working in Critical Care and Non-Critical Care units.

TABLE 5: Comparison of the mean risk assessment scores between unmarried and married nurses from critical care unit. (N=230)

Variables	N	M	SD	SDD	SED	t		Significance
						Calculated Value	Tabulated Value (0.05)	
Unmarried	55	6.2	2.87	3.905	0.729	8.66	1.981	Significant at 0.05 level
Married	60	12.51	4.65					

df (113)

The mean risk assessment score for varicose veins among married nurses in the Critical Care Unit was higher than that of unmarried nurses. The calculated *t* value (8.66) exceeded the critical value (1.981) at the 0.05 significance level with 113 degrees of freedom, indicating a statistically significant difference between the groups. This suggests that marital status is associated with an increased risk of developing varicose veins among nurses.

TABLE 6: Comparison of the mean risk assessment scores between history of pregnancy and no history of pregnancy from critical care unit.

Variables	N	M	SD	SDD	SED	t		Significance
						Calculated Value	Tabulated Value (0.05)	
H/o of Pregnancy	53	12.52	5.21	4.169	0.780	7.211	1.98	Significant at 0.05level
No H/o of Pregnancy	62	6.90	3					

df (113)

The mean risk assessment score for varicose veins among Critical Care nurses with a history of pregnancy was higher than that of nurses who had never been pregnant. The calculated *t* value (7.211) exceeded the critical value (1.98) at the 0.05 significance level with 113 degrees of freedom, indicating a statistically significant difference between the groups. This suggests that nurses with a history of pregnancy have a higher risk of developing varicose veins.

TABLE 7: Comparison of the mean risk assessment scores between no history of constipation and history of constipation, of nurses from critical care units.

Variables	N	M	SD	SDD	SED	t		Significance
						Calculated Value	Tabulated Value (0.05)	
No history of constipation	48	7.04	4.36	4.582	0.866	4.861	1.981	Significant at 0.05 level.
History of constipation	67	11.25	4.73					

df (113)

Critical Care nurses with a history of constipation had higher mean risk assessment scores for varicose veins than those without constipation. The calculated *t* value (4.861) exceeded the critical value (1.981) at the 0.05 significance level with 113 degrees of freedom, indicating a statistically significant difference between the groups. This suggests that a history of constipation is associated with a higher risk of developing varicose veins.

TABLE 8: Comparison between the risk assessment scores of nurses from critical care unit with mode of travel.

Source of Variation	Df	Sum of squares	Mean Square Variances	F		Interpretation
				Calculated Value	Tabulated Value (0.05)	
Among the means of condition	2	380.40	190.20	8.56	3.077	Significant at 0.05 level
Within conditions	112	2488.34	22.21			

The ANOVA results showed that the between-group variability exceeded the within-group variability, indicating a statistically significant difference in mean risk assessment scores based on nurses' mode of travel. As ANOVA was significant, multiple *t*-tests were performed to identify specific group differences. To minimize the increased risk of Type I error associated with multiple comparisons, the Bonferroni correction was applied, adjusting the significance level from 0.05 to 0.017.

TABLE 9: Comparison between the mean risk assessment scores of nurses from critical care units traveling by walking and public transport

Variables	N	M	SD	SDD	SED	t		Significance
						Calculated Value	Tabulated Value (0.01)	
Walking	27	7.85	2.89	4.245	1.037	4.332	2.64	Significant at 0.01 level
Public	44	11.68	4.88					

df (69)

Nurses who traveled by public transport had significantly higher mean risk assessment scores than those who traveled by walking. The calculated *t* value (4.332) exceeded the critical value (2.64) at the 0.01 significance level with 69 degrees of freedom, indicating a statistically significant difference between the two groups.

TABLE 10: Comparison between the mean risk assessment scores of nurses from critical care units traveling by public and private transport

Variables	N	M	SD	SDD	SED	t		Significance
						Calculated Value	Tabulated Value (0.01)	
Public	44	11.68	4.88	5.137	1.095	2.697	2.63	Significant at 0.01 level
Private	44	8.72	5.38					

df (86)

Nurses who traveled by public transport had significantly higher mean risk assessment scores than those who used private transport. The calculated *t* value (2.697) exceeded the critical value (2.63) at the 0.01 significance level with 86 degrees of freedom, indicating a statistically significant difference between the groups.

TABLE 11: Comparison between the mean risk assessment scores of nurses from critical care units traveling by walking and private transport

Variables	N	M	SD	SDD	SED	t		Significance
						Calculated Value	Tabulated Value (0.01)	
Walking	27	7.185	2.896	4.604	1.125	1.369	2.64	Significant at 0.01 level
Private	44	8.727	5.38					

df (69)

Although nurses using private transport had higher mean risk scores than those who walk, the calculated *t* value (1.369) is less than the critical value (2.64). Therefore, the difference between the two groups is not statistically significant.

TABLE 12: The correlation between weight and risk scores of critical care nurses

Correlation	N	DF	r		Significance
			Calculated Value	Table Value (0.05)	
Weight Risk scores	115	113	0.158	0.154	Significant at 0.05 level

Pearson's correlation analysis showed a weak positive relationship between weight and risk scores among Critical Care nurses. The calculated *r* value (0.158) exceeded the table value (0.154) at the 0.05 significance level (df = 113), indicating a statistically significant correlation. Thus, as weight increases, the risk of developing varicose veins also slightly increases.

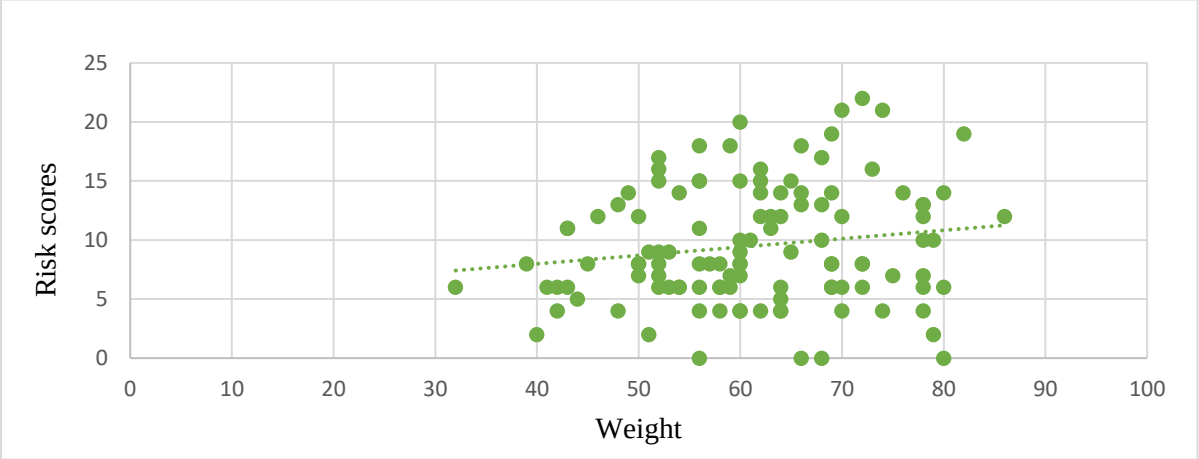

FIGURE 10: Correlation between weight and risk scores of critical care nurses

TABLE 13: The correlation between body mass index and risk scores of critical care nurses

Correlation	N	DF	r		Significance
			Calculated Value	Table Value (0.05)	
Body Mass Index Risk scores	115	113	0.187	0.154	Significant

Pearson's correlation analysis revealed a weak positive relationship between Body Mass Index (BMI) and risk scores among critical care nurses. The calculated *r* value (0.187) exceeded the table value (0.154) at the 0.05 significance level (df = 113), indicating a statistically significant correlation. Thus, higher BMI is associated with a slightly increased risk of developing varicose veins.

TABLE 14: The correlation between height and risk scores of critical care nurses

Correlation	N	DF	r		Significance
			Calculated Value	Table Value (0.05)	
Height Risk scores	115	113	-0.013	0.154	Not Significant

Pearson's correlation analysis showed that the relationship between height and risk scores among critical care nurses was not significant. The calculated *r* value (–0.013) was less than the table value (0.154) at the 0.05 significance level (df = 113). Therefore, height has no significant correlation with the risk of developing varicose veins.

TABLE 15: Comparison between the mean risk assessment scores between unmarried and married nurses from non-critical care unit.

Variables	N	M	SD	SDD	SED	t		Significance
						Calculated Value	Tabulated Value (0.05)	
Unmarried	64	6.703	3.14	4.66	0.875	4.640	1.658	Significant
Married	51	10.76	6.05					

df (113)

The mean risk score of married nurses in the Non-Critical Care Unit was higher than that of unmarried nurses. The calculated *t* value (4.640) exceeded the table value (1.658) at the 0.05 significance level (df = 113), indicating a statistically significant difference between the two groups. This suggests that marital status may influence the risk of developing varicose veins.

TABLE 16: Comparison between the mean risk assessment scores between history of pregnancy and no history of pregnancy non- critical care unit.

Variables	N	M	SD	SDD	SED	t		Significance
						Calculated Value	Tabulated Value (0.05)	
History of Pregnancy	42	11.66	6.249	4.475	0.866	5.74	1.658	Significant
No history of Pregnancy	73	6.68	3.031					

df (113)

The mean risk score of Critical Care Unit nurses with a history of pregnancy was higher than that of those without such a history. The calculated *t* value (5.74) exceeded the table value (1.658) at the 0.05 significance level (df = 113), indicating a significant difference between the groups. This suggests that nurses with a history of pregnancy have a higher risk of developing varicose veins.

TABLE 17: Comparison of the mean risk assessment scores between no history of constipation and history of constipation of nurses from non-critical care units

Variables	N	M	SD	SDD	SED	t		Significance
						Calculated Value	Tabulated Value (0.05)	
No history of constipation	57	6.77	3.826	4.783	0.892	3.850	1.658	Significant
History of constipation	58	10.20	5.565					

df (113)

The mean risk score of Non-Critical Care Unit nurses with a history of constipation was higher than that of those without such a history. The calculated *t* value (3.850) exceeded the table value (1.658) at the 0.05 significance level (df = 113), indicating a significant difference between the groups. This suggests that nurses with a history of constipation have a higher risk of developing varicose veins.

TABLE 18: Comparison between the risk assessment scores of nurses from non-critical care units with mode of travel

Source of Variation	Df	Sum of squares	Mean Square Variances	F		Interpretation
				Calculated Value	Tabulated Value (0.05)	
Among the means of condition	2	66.91	33.456	1.311	3.077	Not Significant
Within conditions	112	2857.8	25.516			

The between-group variability was not greater than the within-group variability. The *F* test indicated that this difference was not significant, suggesting that the mode of travel has no significant relationship with the risk assessment scores.

TABLE 19: The correlation between weight and risk scores of non-critical care nurses

Correlation	N	DF	r		Significance
			Calculated Value	Table Value (0.05)	
Weight Risk scores	115	113	0.259	0.154	Significant at 0.05 level

Pearson's correlation analysis showed a weak positive relationship between weight and risk scores among Non-Critical Care nurses. The calculated *r* value (0.259) exceeded the table value (0.154) at the 0.05 significance level (df = 113), indicating a significant correlation. Thus, higher weight is associated with a slightly increased risk of developing varicose veins.

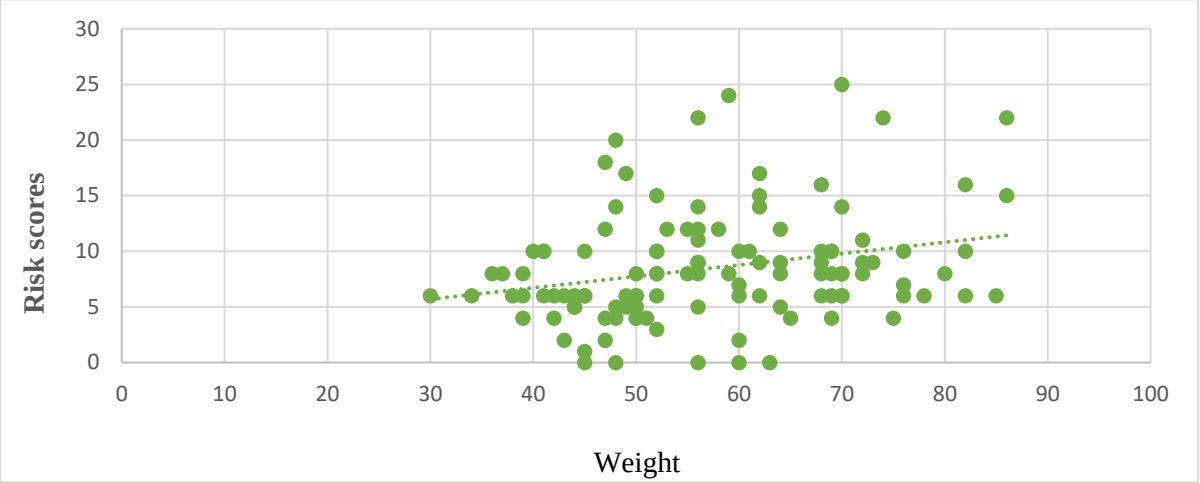

FIGURE 11: Correlation between weight and risk scores of non-critical care nurses

TABLE 20: The correlation between body mass index and risk scores of non-critical care nurses

Correlation	N	DF	r		Significance
			Calculated Value	Table Value (0.05)	
Body Mass Index Risk scores	115	113	0.2714	0.154	Significant at 0.05 level

Pearson's correlation analysis revealed a weak positive relationship between Body Mass Index (BMI) and risk scores among Non-Critical Care nurses. The calculated *r* value (0.271) exceeded the table value (0.154) at the 0.05 significance level (df = 113), indicating a significant correlation. Thus, higher BMI is associated with a slightly increased risk of developing varicose veins.

FIGURE 12: Correlation between body mass index and risk scores of non-critical care nurses

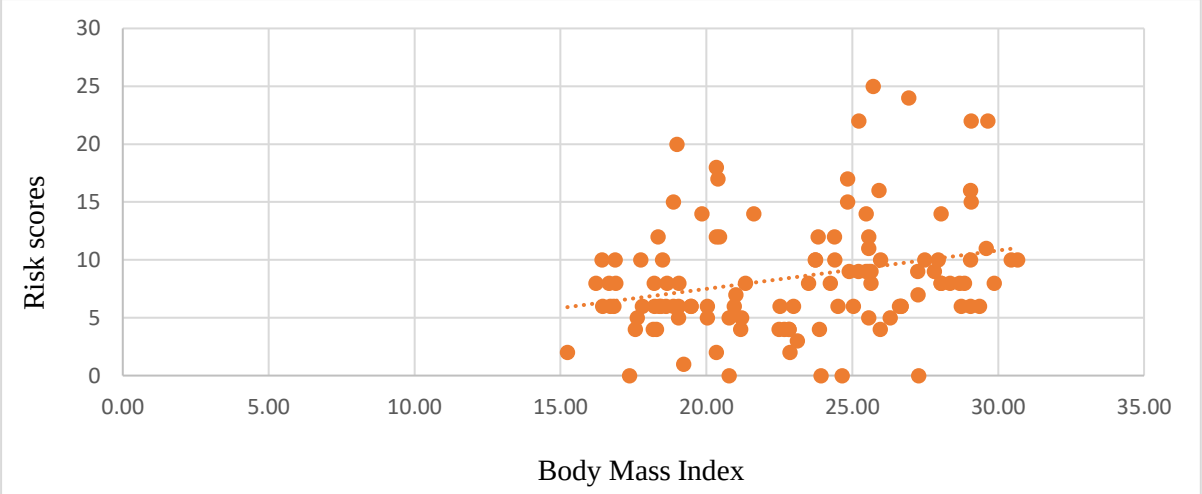

TABLE 21: The correlation between height and risk scores of non-critical care nurses

Correlation	N	DF	r		Significance
			Calculated Value	Table Value (0.05)	
Height Risk scores	115	113	0.095	0.154	Not Significant

Pearson's correlation analysis showed that the relationship between height and risk scores among Non-Critical Care nurses was not significant. The calculated *r* value (0.095) was less than the table value (0.154) at the 0.05 significance level (df = 113). Thus, height has no significant correlation with the risk of developing varicose veins.

DISCUSSION

The present study assessed and compared the risk of varicose veins among nurses working in Critical Care and Non-Critical Care units in selected hospitals of Goa. The findings highlight a multifactorial etiology influenced by demographic, occupational, and lifestyle factors, emphasizing the need for early risk identification and structured preventive strategies for the nursing workforce. The results are consistent with existing literature and underscore important implications for occupational health and nursing practice. [16]

The demographic distribution revealed that most nurses were between 21–30 years of age, reflecting India's young nursing workforce. Despite their younger age, symptoms such as pain, heaviness, and burning were common across categories, indicating that occupational exposure plays a greater role than age in early venous insufficiency. [17] This trend aligns with earlier studies in which prolonged standing and work-related strain outweighed age as primary determinants of venous symptoms. [18]

The predominance of female nurses (98.2%) is consistent with global nursing demographics. Given that female gender is an established risk factor for chronic venous disease due to hormonal influences and reproductive history, the study population itself carries a baseline predisposition. Literature consistently reports higher venous disease prevalence among women, a finding reaffirmed in this study. [19]

Marital status showed a strong association with increased venous risk, with married nurses exhibiting higher risk scores. This may be attributed to cumulative factors such as pregnancy, greater household workload, and reduced opportunities for rest. [20] International research similarly links reproductive history and marital status with higher venous insufficiency risk. Although educational level varied between groups, it did not show a direct influence on varicose vein risk in this study. [21]

Prolonged standing—reported by all participants—is one of the most significant occupational contributors to venous insufficiency. Continuous standing elevates hydrostatic venous pressure, promotes pooling, and compromises valve function. Surprisingly, there was no significant difference in overall risk scores between Critical and Non-Critical Care nurses. [22] Earlier literature often reports higher risk among ICU and OR personnel; however, the lack of difference here may stem from similar workloads, staffing shortages, and uniformly high physical demands across units in the hospitals studied. [23]

Pregnancy emerged as a major contributor to risk, as expected. Nurses with a history of pregnancy demonstrated significantly higher risk scores in both groups, consistent with the well-established pathophysiological pathways of increased blood volume, hormonal venous dilation, and mechanical pelvic pressure. [24] Although some preventive measures—like left lateral positioning and leg exercises—were adopted, the use of compression stockings was notably low, pointing to a gap in awareness or accessibility. Given that compression therapy is internationally recommended, this finding highlights the need for improved preventive education among nurses. [25]

Constipation was another significant risk factor, with nurses reporting constipation showing higher risk scores. Chronic straining elevates abdominal pressure, hindering venous return and contributing to venous congestion. Similar associations between constipation and venous disorders have been documented in previous studies, emphasizing the importance of hydration, fiber intake, and regular physical activity as preventive measures. [26]

Although correlations between weight/BMI and venous risk were weak, they were statistically significant, indicating that even modest increases in body weight may elevate venous pressure and impair venous return. [27] This is consistent with global evidence showing that excess adiposity, particularly abdominal fat, exerts mechanical pressure on venous structures. In contrast, height showed no association with venous risk, supporting literature indicating that height alone is not a predictor of varicose veins. [28] Overall, the findings indicate that varicose vein risk among nurses is shaped by a combination of occupational exposures (particularly prolonged standing), reproductive factors, constipation, and body composition. [29] The lack of difference between Critical and Non-Critical Care units suggests that venous risk may be uniformly elevated across nursing roles in Indian hospital settings due to systemic workforce pressures. Early identification and targeted preventive strategies, including compression therapy, ergonomic adjustments, and lifestyle counseling, are essential to reduce long-term complications. [30]

CONCLUSION

This study highlights the considerable risk of early venous insufficiency among nurses in both Critical and Non-Critical Care units of selected hospitals in Goa. Using the Modified Venous Clinical Severity Score (VCSS), findings demonstrate that varicose vein risk is shaped by a multifactorial interplay of non-modifiable factors—such as female gender, pregnancy, and marital status—and modifiable factors, including prolonged standing, constipation, and increased body weight. Notably, younger nurses (21–30 years) exhibited symptoms such as leg pain, heaviness, burning, and cramps, indicating that occupational demands, rather than age alone, are pivotal in venous deterioration.

No significant differences in risk were observed between Critical and Non-Critical Care nurses, suggesting that occupational strain is pervasive across hospital units. While visible varicosities and severe symptoms were minimal, mild early-stage manifestations were common, underscoring a critical window for preventive interventions.

Institution-level strategies are warranted, including promoting compression stockings, ergonomic adjustments, micro-breaks with leg elevation, venous health education, lifestyle modifications for exercise and weight management, and addressing modifiable factors such as constipation. Implementing these measures can prevent disease progression, enhance nurses' quality of life, and strengthen workforce capacity for safe and effective patient care.

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