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RESEARCH ARTICLE

The Effect of Varicose Veins on the Quality of Life of Adult Female Patients in the Eastern Region of Saudi Arabia

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Abstract:

Background:

Cases of varicose veins are increasing globally. One of the most common risk factors for developing varicose veins is the female gender. Varicose veins not only affect one's working ability but also reduce the quality of life. There is a lack of research that focuses on the effect of varicose veins on patients' quality of life in Saudi Arabia.

Objective:

The aim of this study was to explore the quality of life of female Saudi Arabian patients with varicose veins.

Methods:

An analytical cross-sectional research study was conducted targeting women with varicose veins in the Eastern Province of Saudi Arabia. An online questionnaire containing two sections was distributed through social media. The first section was composed of items regarding demographic, occupational, and varicose vein-related risk factors. The second section included the items of the Chronic Venous Insufficiency Quality of Life Questionnaire (CIVIQ).

Results:

The study included 128 female patients aged 18 years or older, with 57 (44.5%) of them being between the ages of 45 and 54 years. Only body mass index ($\beta = -0.304$, $t = -2.870$, $p = 0.005$), frequent constipation ($\beta = -0.258$, $t = -2.870$, $p = 0.009$), and long rest periods during work ($\beta = 0.517$, $t = 2.111$, $p = 0.037$) were significant predictors of quality of life.

Conclusion:

Higher body mass index and frequent constipation were the main contributors to reduced quality of life among the participants, while a prolonged rest period during work was associated with a better quality of life.

Keywords: CIVIQ, Female, Quality of life, Varicose diseases, Risk factors, Saudi Arabia.

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1. INTRODUCTION

Varicose Veins (VVs) are enlarged, tortuous veins that can affect various parts of the body, but they are primarily found in the lower extremities [1]. Cases of VVs are increasing globally [2]. The prevalence of VVs in the lower extremities ranges between 10% and 30% worldwide [3]. Based on repeated clinical examinations, the annual incidence rate of VVs is 1.4

to 2.3 per 100 person-years. The prevalence of VVs is estimated to be < 1% to 73% among women and < 2% to 56% among men [4].

Epidemiological studies have established that common risk factors for developing VVs include age, overweight and obesity [2, 5, 6], pregnancy [7, 8], contraceptive use [9], occupations that require prolonged hours of standing or walking [10 - 12], family history [2, 5], constipation, and smoking [2, 3, 13].

Quality of Life (QoL) has been defined as "an overall general well-being that comprises objective descriptors and

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subjective evaluations of physical, material, social, and emotional well-being together with the extent of personal development and purposeful activity, all weighted by a personal set of values" [14]. VVs have significant effects on patients' QoL. In addition to being an unwanted cosmetic condition that affects the patients psychologically, VVs can cause many physical symptoms, such as skin discoloration, burning and itching sensations, and swelling of the lower extremities, which usually cause pain and discomfort [1]. Moreover, VVs may lead to serious complications associated with impaired superficial and deep venous systems [15, 16]. Therefore, developing VVs can impair a person's functioning ability and productivity and consequently reduce their QoL [15].

The management of VVs appears to pose a significant burden on the healthcare system as it is considered one of the most common causes for appointments with primary care providers [16, 17]. The burden of the disease varies across countries [18]. The situation in Saudi Arabia is not clear regarding the prevalence of VVs, as there is a paucity of research in this area. However, one study reported the prevalence of chronic venous insufficiency in the Saudi population as 38.3%, and it was found to be higher in females (49.6%) [19].

There is a lack of research that focuses on understanding the effects of VVs on the QoL of patients in Saudi Arabia. Therefore, the objectives of this study were to explore the QoL of female patients with VVs and to determine possible associations between demographic characteristics and QoL among female patients with VVs in the Eastern Province of Saudi Arabia.

2. MATERIALS AND METHODS

Ethical approval for conducting the study was secured from the Institutional Review Board (IRB) of Imam Abdulrahman Bin Faisal University (IAU), Saudi Arabia (SA). An analytical cross-sectional study was conducted in the Eastern Province of Saudi Arabia during March 2020. The population of this study was all female patients diagnosed officially by doctors as having VVs in the Eastern Province of SA. The inclusion criteria were females 18 years of age or older who had developed VVs and had been officially diagnosed with the disease. While the exclusion criteria were all male participants, females of age less than 18 years and who had not been diagnosed officially with VVs disease. All participants were kindly asked to participate voluntarily by signing an informed consent that explained the objectives of the study. The tool used to collect the data was an online questionnaire that contained two sections. The first section was composed of items regarding demographics, occupational/working status, and VV-related risk factors. The first two questions were asked to ensure that the participant met the inclusion criteria. The second section included the items of the Chronic Venous Insufficiency Quality of Life Questionnaire (CIVIQ).

The demographic characteristics included questions regarding age, body weight, height, nationality, marital status, educational level, monthly income, and employment status.

The weight and height variables were self-reported by participants and were used to calculate the Body Mass Index (BMI) of the participants. The World Health Organization (WHO) classifications of BMI (underweight, normal, overweight, obesity class 1, obesity class 2, and obesity class 3) were used in this study [20]. However, due to the relatively small number/frequency of participants for each of the six WHO BMI levels, the BMI levels were regrouped into the following: normal (underweight + normal) if BMI was 18-24.9, overweight for BMI of 25-29.9, and obese (obesity class 1 + obesity class 2 + obesity class 3) if BMI range was 30 or above.

The VV-related risk factor questions included smoking, frequent constipation, use of contraceptives, number of children, and family history. The occupational/working conditions questions included questions regarding employment status, the nature of their profession, working years, working hours/day, standing status in the workplace, rest period/day, the period of work in a standing position, and period of work in a walking position.

The CIVIQ was developed by Launois *et al.* [21]. Previous studies showed that the CIVIQ questionnaire is a feasible, valid, and reliable tool for the assessment of QoL in patients with the varicose disease. It has been used frequently, and it is available in 17 languages [22]. The CIVIQ questionnaire contains 20 questions that cover four domains: 'pain' (four items), 'physical' (four items), 'social' (three items) and 'psychological' (nine items). The online questionnaire was distributed through social media (Twitter and WhatsApp) during March 2020. The participants indicated their responses based on their recall period of the previous four weeks. A five-point Likert scale response was used, with higher scores indicating more severe impairment and a lower QoL. The CIVIQ provides global index scores (GIS) by applying the following equation: $(S-m)/(M-m) \times 100$. Where S is the sum of the scores for the patients' answers to the 20 items; m is the minimum theoretical value if all of the answers were on the first level of the scale for all of the 20 items; and M is the maximum theoretical value if all of the items were scored at the maximum level on the scale for all 20 items.

However, to facilitate interpretation of the results, the GIS were inverted so that scores could range from 0 to 100 with higher scores corresponding to better QoL [23].

The Statistical Package for Social Sciences (SPSS) version 23 was used for statistical data analysis. Descriptive analysis was carried out and frequencies and summary statistics were also calculated. Independent-sample t-test and Analysis of Variance (ANOVA) were utilized to examine demographic differences in GIS for QoL. Regression analysis was utilized to identify the predictors of QoL. Results with a p-value < 0.05 were considered to be statistically significant.

3. RESULTS

Table 1 summarizes the demographic characteristics and VV-related risk factors of the participants. Of the 128 female patients, 57 (44.5%) were between the ages of 45 and 54 years. Nearly one-third were between 35 and 44 years old. The majority (86%) of the participants were overweight and obese.

The majority (94.5%) of the participants were Saudis. Most of the participants (85.9%) were married. More than half (56.3%) of the participants had a bachelor or postgraduate degree, while 30% had a high school education. The participants were almost equally distributed among the three categories of monthly household income. The majority (79.7%) of the participants had three or more children. The non-smokers represented the greater group, as 125 (97.7%) of the participants were non-smokers. More than half of the participants (58.6%) indicated that they frequently suffer from constipation. Of the 128 participants, 82 (64.1%) had one or more family members with VVs. More than one-third (35.9%) of the participants used contraceptives.

Table 2 reports the descriptive statistics for the occupational/working conditions of the participants. Seventy-

six (59.4%) of the participants were unemployed/household, while 52 (40.6%) of them were employed. Educational professions were the most common among the employed participants, as 28 (21.9%) of them worked in an educational field. Nearly two-third (62%) of the employed participants had been working in their current occupation for more than 10 years. The majority (36 of 52) of the employed participants worked for 8 hours per day. Forty-two percent (22 of 52) of the employed participants had approximately 30 1-hour breaks. Almost all (50 of 52) the employed participants (96%) worked in a profession that required them to stand. However, 30 of 52 (58%) of the workers were working in a standing position for 2-4 hours per day. On the other hand, the majority (30 of 52, 58%) of the participants worked in a walking position for less than two hours per day, while only 10 of 52 (19%) worked in a walking position for more than 4 hours.

Table 1. Descriptive statistics for the demographic characteristics and varicose vein-related risk factors of the participants (n = 128).

Variable	Categories	Frequency	Percentage
Age	< 35 years	16	12.5%
	35–44 years	41	32.1%
	45–54 years	57	44.5%
	> 55 years	14	10.9%
BMI (kg/m2)	Normal	18	14.1%
	Overweight	56	43.7%
	Obese	54	42.2%
Nationality	Saudi	121	94.5%
	Non-Saudi	7	5.5%
Marital status	Married	110	85.9%
	Unmarried	18	14.1%
Education	Less than high school	18	14.1%
	High school	38	29.7%
	Bachelor/postgraduate	72	56.2%
Monthly household income	> 10,000 Saudi Riyal (SR)	44	34.3%
	10,000–15,000 SR	40	31.3%
	< 10,000 SR	44	34.4%
Number of children	None	11	8.6%
	One child	5	3.9%
	Two Children	10	7.8%
	Three or more	102	79.7%
Smoking status	Smoker	3	2.3%
	Non-smoker	125	97.7%
Frequent constipation	Yes	75	58.6%
	No	53	41.4%
Family member(s) with VVs	Yes	82	64.1%
	No	46	35.9%
Contraceptive use	Yes	46	35.9%
	No	82	64.1%

Table 2. Descriptive statistics for the occupational/working conditions of the participants (n = 128).

Variable	Categories	Frequency	Percentage
Employment status	Unemployed	76	59.4%
	Employed	52	40.6%
Nature of work/profession	Educational profession	28	21.9%
	Administrative work	13	10.1%
	Healthcare profession	9	7.0%
	Hairdresser	2	1.6%
	Household	76	59.4%

(Table 2) contd....

Variable	Categories	Frequency	Percentage
Working Years	< 5 years	5	3.9%
	5–10 years	15	11.7%
	> 10 years	32	25.0%
	Not applicable	76	59.4%
Working hours/day	4 hours	2	1.6%
	6 hours	8	6.2%
	8 hours	36	28.1%
	> 8 hours	6	4.7%
	Not applicable	76	59.4%
Do you stand at work?	Yes	50	39.0%
	No	2	1.6%
	Not applicable	76	59.4%
Rest period/day	< 20 min	4	3.1%
	20–30 min	20	15.6%
	30 min-1 hour	22	17.2%
	> 1 hour	6	4.7%
	Not applicable	76	59.4%
Period of work in a standing position	< 2 hours/day	3	2.3%
	2-4 hours/day	30	23.4%
	> 4 hours/day	19	14.8%
	Not applicable	76	59.4%
Period of work in walking position	< 2 hours/day	30	23.4%
	2-4 hours/day	12	9.4%
	> 4 hours/day	10	7.8%
	Not applicable	76	59.4%

3.1. QoL and Demographic Characteristics

Table 3 summarizes the mean scores \pm standard deviation for GIS by demographics, VV-related risk factors, and working condition factors for participants. For the demographics and VV-related risk factors, the highest overall GIS were found for the age group < 35 years, followed by those in the age group 35–44 years (64.2 and 56.7, respectively). GIS for participants with normal weight were greater than those participants who were overweight or obese (64.5, 56.4, and 53.6, respectively), indicating that obese and overweight patients tended to report worse QoL. Saudi participants had worse GIS (56.0) than non-Saudis (62.1). Married women had lower scores (55.8) than those of unmarried women (59.8). The GIS seemed to increase with the level of education. Women who had less than a high school education exhibited the lowest mean scores (49.5), followed by those with a high school education (55.3) and those with bachelor or postgraduate education (58.6). Regarding family size, the highest GIS were found among women who had one child (61.5), followed by those for women who had no children (58.7). There was a significant difference ($p = 0.001$) between those who suffered from frequent constipation and those who did not (51.8 and 62.7, respectively), indicating a better QoL of those who did not suffer from frequent constipation. Patients who had family members with VVs tended to have lower GIS than those who did not have a family history of VVs (54.6 and 59.4, respectively). There was little difference in GIS between those who used contraceptives and those who did not.

3.2. QoL and Working Conditions

The GIS indicated a better QoL among employed participants than that of unemployed participants (57.7 and 55.4, respectively). According to the types of profession, the lowest GIS were among hairdressers (53.1), and the highest

were among education professionals (60.8). Participants who had been in their jobs for less than five years had higher GIS than those who had been at their jobs longer. Participants who worked for four hours per day had higher GIS than the other employed participants. The GIS of those whose work required them to stand were lower than those participants who were not required to stand at work (57.7 and 56.2, respectively). Additionally, those who had less than a 20-minute break during their work had the lowest GIS, while those who had more than a one-hour break had the highest GIS (50.9 and 74.3, respectively).

The GIS for those who worked in a standing position for less than two hours per day were the highest, while those working for more than four hours had the lowest (68.6 vs. 54.8, respectively). The GIS scores for those walking at work for about two to four hours per day were the greatest, while for those walking at work for more than four hours were the lowest (62.2 and 48.2, respectively). However, no statistically significant difference was found for the GIS among the studied groups based on working condition variables.

3.3. Regression analysis: Global Index Score

Linear regression was performed to examine whether age, BMI, marital status, education level, monthly salary, employment status, profession, years of working, working hours, standing during work, rest periods at work, amount of time in a standing position at work, amount of time walking at work, number of children, family member(s) with VVs, or frequent constipation predict GIS of QoL (Table 4). The results showed that only BMI ($\beta = -0.304$, $t = -2.870$, $p = 0.005$), frequent constipation ($\beta = -0.258$, $t = -2.870$, $p = 0.009$), and having a rest period during work ($\beta = 0.517$, $t = 2.111$, $p = 0.037$) were significant predictors of QoL. A significant regression equation emerged ($F = 2.280$, $p < 0.05$), and the

corresponding R² value was 0.247. This indicated that only 24.7% of the variance in GIS of QoL was explained by BMI,

frequent constipation, and having a rest period; conversely, 75% of the variance might be attributed to other factors.

Table 3. The mean ± standard deviation Global Index Scores (GIS) for each studied group.

Variables	Categories	mean GIS ± standard deviation	p-value
Age (years)	< 35	64.2 ± 23.1	0.267
	35–44	56.7 ± 14.3	
	45–54	54.4 ± 18.9	
	55 or greater	54.4 ± 16.0	
BMI	Normal	64.5 ± 19.3	0.080
	Overweight	56.4 ± 16.3	
	Obese	53.6 ± 18.5	
Nationality	Saudi	56.0 ± 17.8	0.387
	Non-Saudi	62.1 ± 20.3	
Marital status	Unmarried	59.8 ± 21.1	0.380
	Married	55.8 ± 17.4	
Education	< High school	49.5 ± 22.7	0.147
	High school	55.3 ± 17.6	
	Bachelor or higher	58.6 ± 16.5	
Monthly income	< 10,000 SR	54.7 ± 22.0	0.680
	10,000–15,000 SR	56.2 ± 14.4	
	> 15,000 SR	58.1 ± 16.5	
Employment	Unemployed	55.4 ± 20.1	0.494
	Employed	57.7 ± 14.2	
Type of profession	Educational profession	60.8 ± 15.2	0.683
	Administrative work	54.0 ± 13.6	
	Healthcare profession	54.3 ± 9.2	
	Hairdresser	53.1 ± 23.8	
	Household	55.4 ± 20.1	
Working years	< 5 years	60.2 ± 19.7	0.721
	5–10 years	54.0 ± 12.2	
	> 10 years	59.0 ± 14.3	
	N/A	55.4 ± 20.1	
Working hours per day	4 hours	80.6 ± 4.41	0.422
	6 hours	55.3 ± 13.1	
	8 hours	57.0 ± 14.2	
	> 8 hours	57.5 ± 13.0	
	N/A	55.4 ± 20.1	
Do you stand at work?	Yes	57.7 ± 14.4	0.787
	No	56.2 ± 8.83	
	N/A	55.4 ± 20.1	
Rest period	< 20 min	50.9 ± 19.7	0.138
	20–30 min	54.2 ± 12.9	
	1 hour	57.5 ± 13.0	
	> 1 hour	74.3 ± 7.77	
	N/A	55.4 ± 20.1	
Period of work in a standing position	< 2 hours	68.7 ± 20.8	0.546
	2–4 hours	58.4 ± 13.9	
	> 4 hours	54.8 ± 13.5	
	N/A	55.4 ± 20.1	
Period of work in a walking position	< 2 hours	59.0 ± 15.2	0.244
	2–4 hours	62.2 ± 13.0	
	> 4 hours	48.2 ± 7.31	
	N/A	55.4 ± 20.1	
Number of children	None	58.7 ± 20.9	0.883
	One child	61.5 ± 15.9	
	Two children	55.5 ± 17.8	
	Three or more children	55.9 ± 17.9	
Smoking status	Smoker	57.5 ± 28.2	0.915
	Non-smoker	56.3 ± 17.8	
Frequent constipation	Yes	51.8 ± 12.4	0.001*
	No	62.7 ± 22.2	

(Table 3) contd....

Variables	Categories	mean GIS \pm standard deviation	p-value
Family member(s) with VVs	Yes	54.6 \pm 15.9	0.146
	No	59.4 \pm 21.0	
Contraceptive use	Yes	56.9 \pm 16.9	0.803
	No	56.0 \pm 18.6	

Note: *Significant at $\alpha < 0.05$ (two-tailed)

Table 4. Regression analysis of global index scores.

-	Unstandardized Coefficients		Standardized Coefficients	t	p-value
	B	Standard Error	β		
(Constant)	9.696	78.261		0.124	0.902
Constipation	-9.371	3.511	-0.258	-2.669	0.009*
Age	-0.255	2.350	-0.012	-0.108	0.914
BMI	-7.837	2.731	-0.304	-2.870	0.005*
Marital status	-8.355	5.578	-0.162	-1.498	0.137
Education	4.648	2.679	0.188	1.735	0.086
Income	1.857	2.148	0.086	0.865	0.389
Employment status	56.188	70.919	1.541	0.792	0.430
Profession	-2.572	2.873	-0.183	-0.895	0.373
Working years	1.556	4.539	0.112	0.343	0.732
Working hours/day	0.458	4.737	0.029	0.097	0.923
Standing status	12.251	13.308	1.669	0.921	0.359
Rest period at work	7.156	3.389	0.517	2.111	0.037*
Work in standing position	-3.623	5.727	-0.278	-0.633	0.528
Work while walking	-1.886	2.925	-0.183	-0.645	0.520
Number of children	1.468	2.404	0.075	0.611	0.543
Family member(s) with VVs	2.812	3.510	0.075	0.801	0.425

Note: *Significant at $\alpha < 0.05$ (2-tailed)

Dependent Variable: Global index scores (GIS), $R = 0.497$, $R^2 = 0.247$, Adjusted $R^2 = 0.139$

4. DISCUSSION

The aim of this study was to explore the QoL of female patients in eastern Saudi Arabia who have VVs and to determine potential associations between demographic characteristics of these patients and their QoL. Limited epidemiological studies have been conducted to evaluate VVs, especially in the Middle Eastern region. This may be due to the low mortality involved with VVs, although the morbidity and disability involved are substantial. This study is one of the few studies that considered assessing the associations between the global QoL value and the demographic characteristics of the patients. Thus, the results of the present study will provide the groundwork for future studies and the upgrading of patients' individual health.

This study was conducted among 128 females who were diagnosed clinically with VVs. Older participants (ages 45 and older) had worse QoL based on mean GIS compared to that of younger participants. Female patients with VVs may suffer from reduced QoL as they grow older in part due to limitations in their physical abilities and social impairment. Our results are consistent with the findings of Clark *et al.* [24], Ortega-Santana *et al.* [25], Soydan *et al.* [26] that showed that QoL decreased as age increased.

Previous studies have conveyed that obesity is a risk factor for developing VVs [2, 5, 6]. In our study, a higher BMI of participants was associated with a reduction in overall QoL.

This was an important finding, as it shows that overweight and obese patients with VVs may suffer from worse QoL compared to patients with normal BMI. The findings of this study confirm the need for weight reduction interventions to improve the QoL of VV patients. Moreover, Branisteanu *et al.* [27] reported that BMI was associated with the severity of chronic venous disease for the female group in their study. This finding was consistent with the possible explanation of the poor QoL among obese participants, as they may suffer from a more severe form of the disease [24, 28, 29].

It was observed in this study that the participants who had less than a high school degree suffered from worse QoL according to their GIS. This finding is consistent with a study done by Soydan *et al.* [26] in 2017, where 58.3% of the participants had an educational level of high school or below. These results could be explained by how health and health care-seeking behaviors are influenced by educational level, making individuals with higher education more inclined to adopt a healthier lifestyle and have better access to healthcare. Our study was in line with that of Kahn *et al.* [28], who found that education level was associated with QoL scores.

As more than half (58.6%) of the patients suffered from frequent constipation, this supports the findings in other studies that constipation has an influence on the development of VVs [2, 3, 13]. However, no previous study considered the effect of frequent constipation on the QoL of VV patients. Our study

demonstrated that constipation had a significant negative effect on the QoL of patients with VVs. Overall, the findings revealed that increased BMI and frequent constipation were associated with worse QoL. However, an increased rest period during the workday was associated with better QoL.

In the present study, the GSI were low in participants who worked in standing position for long hours in a day and had a poorer QoL than that of their counterparts. In previous studies, standing for a long-term was believed to be a secondary risk factor for VVs [30, 31], stressing that the standing position increases problems related to VVs and recommending leg elevation to decrease the potential development of VVs.

This study has some limitations. First, since this study was restricted to female patients with VVs, the results should be generalized with caution. Future studies should involve male patients to more broadly compare the QoL of patients with VVs. Second, the present study was conducted during the period of the COVID-19 pandemic, which made the distribution and collection of data through social media safer for both patients and researchers. However, using social media as a means to reach the patients may have affected the number of respondents. Other methods of collecting data in future studies are recommended. Third, although several associations were identified in this study, cause-effect relationships were not identified; therefore, causality cannot be assumed.

CONCLUSION

The results of this study demonstrate that female VV patients in the Eastern Region of Saudi Arabia have a low QoL. Increased BMI and frequent constipation in the VV patients had significant negative effects on QoL, while prolonged rest periods during the workday positively impacted QoL.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval of the study was obtained from the Institutional Review Board (IRB) (UGS-2020-03- 006) of Imam Abdulrahman Bin Faisal University (IAU), in Saudi Arabia.

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

CONSENT FOR PUBLICATION

All patients participated on a voluntary basis and gave their informed consent.

AVAILABILITY OF DATA AND MATERIALS

The data that supports the findings of this article is available from the corresponding author [M.F.Q], upon reasonable request.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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