

# Measuring the quality of life and itch intensity in patients with chronic venous disease using CIVIQ-20 and Pruritus Numerical Rating Scale among individuals in Poland

Justyna Putek<sup>1</sup>, Aleksander Truszyński, Edwin Kuźnik

*Department of Angiology, Hypertension and Diabetology, Wrocław Medical University, Wrocław, Poland*

## ABSTRACT

**Introduction:** Chronic venous disease (CVD) is a condition affecting many people worldwide. This study aimed to measure the quality of life and itch intensity in patients with CVD using the Chronic Venous Disease Quality of Life Questionnaire (CIVIQ-20) and Pruritus Numerical Rating Scale (NRS) among individuals in Poland.

**Material and methods:** The study was based on an internet questionnaire fulfilled by 160 respondents. 57 (35.6%) represented grade 1 according to Clinical–Aetiology–Anatomy–Pathophysiology (CEAP) Classification, 57 (35.6%) grade 2, 26 (16.2%) grade 3, 12 (7.5%) grade 4, 5 (3.1%) grade 6 and 3 (2%) grade 5.

**Results:** The mean CIVIQ-20 global score for all CEAP classes was  $50.1 \pm 17.7$ . 67 (41.9%) respondents reported the presence of itch. The mean intensity of itch for individual groups was: 1.6 for C1, 1.9 for C2, 1.0 for C3, 2.3 for C4, 7.0 for C5 and 3.6 for C6. A fair positive correlation was found between the level of advancement of CVD and a global score of CIVIQ-20 ( $r = 0.332$ ,  $p < 0.001$ ), level of advancement of CVD and body mass index (BMI) ( $r = 0.345$ ,  $p < 0.001$ ), and the number of symptoms and the global score of CIVIQ-20 ( $r = 0.370$ ,  $p < 0.001$ ).

**Conclusions:** To assess the quality of life of patients with CVD, CIVIQ-20 can be used in clinical practice regarding its fair correlation with the intensity and advancement of CVD.

**Forum Derm. 2023; 9, 4: 147–151**

**Keywords:** chronic venous disease (CVD), varicose veins, itch, pruritus

## INTRODUCTION

Chronic venous disease (CVD) is a condition affecting many people worldwide. CVD is diagnosed more commonly in women and its prevalence increases with age. The most common symptoms are leg pain, leg heaviness, leg tingling, leg cramps or itch. Itch is an unpleasant sensation that induces a desire to scratch and occurs in many dermatological conditions e.g. atopic dermatitis, psoriasis, or urticaria. Itch is not often associated with CVD and that is why it is often neglected. However, due to skin changes which occur with CVD, pruritus can cause further skin damage and thus worsen the overall condition of a patient [1]. In the study, the authors wanted to especially focus on this symptom and measure the intensity of it in the Polish population.

The clinical spectrum of CVD ranges from asymptomatic to hard-healing ulcers and thereby impacts the physical and psychological health of individuals as well as the global economy [2]. Current papers show that higher stages of CVD are associated with lower quality of life and that the appropriate treatment greatly improves the comfort of life [3, 4]. The

most common questionnaire specific to CVD regarding the quality of life is the Chronic Venous Disease Quality of Life Questionnaire (CIVIQ-20) which consists of 20 items. Pruritus often results in sleep deprivation or emotional lability, leading to a significant deterioration in the quality of life [5]. Due to a lack of research regarding the correlation between the quality of life and pruritus in CVD in the Polish population, this research was conducted. This study aimed to measure the quality of life and itch intensity in patients with CVD using CIVIQ-20 and Pruritus Numerical Rating Scale (NRS) among individuals in Poland.

## MATERIAL AND METHODS

This paper was based on an internet questionnaire which was posted on Facebook's groups gathering people suffering from CVD. The data were collected between the 2<sup>nd</sup> of March 2023 to 9<sup>th</sup> of March 2023. Firstly, respondents answered general questions concerning their age, level of education, body mass index (BMI) and type of work. Then, individuals were requested to describe their stage of CVD

### Address for correspondence:

Justyna Putek, Klodzka 7/10, 50–536 Wrocław, phone: +48 603092912; e-mail: putek.justyna@gmail.com

Received: 27.03.2023

Accepted: 19.05.2023

Early publication date: 7.06.2023

This article is available in open access under Creative Common Attribution-Non-Commercial-No Derivatives 4.0 International (CC BY-NC-ND 4.0) license, allowing to download articles and share them with others as long as they credit the authors and the publisher, but without permission to change them in any way or use them commercially.

using pictures presenting stages of this disease according to the Clinical–Aetiology–Anatomy–Pathophysiology (CEAP) Classification [6]:

- C1: telangiectases or reticular veins,
- C2: varicose veins,
- C3: oedema,
- C4: skin changes: hyperpigmentation, eczema, atrophie blanche,
- C5: healed venous ulcer,
- C6: active venous ulcer.

The pictures represented the successive stages of chronic venous insufficiency and were accompanied by descriptions so that patients could choose the answer more reliably.

Respondents chose the photo which best reflected their skin changes. On this basis, the medical doctor classified the patient into a particular group according to the CEAP classification.

Subsequently, volunteers were asked to describe what kind of symptoms of CVD was present, and if itch was the answer, individuals assessed the intensity of it using Pruritus NRS [7]. Further, respondents were asked to say if CVD was diagnosed by a medical doctor, and what treatment was applied. Lastly, volunteers were requested to fulfil the CIVIQ-20 [8] which is a 20-item questionnaire composed of 4 quality-of-life dimensions regarding pain, physical, psychological and social life. The respondents assess how much the given statements correlate with their situation using a five-point Likert scale, which provides a global index. A low score corresponds to greater patient comfort in life.

**Statistical analysis**

Statistical analysis was performed using the software Microsoft Excel and XLMiner Analysis ToolPak. The mean and SD were calculated. Pearson’s correlation coefficient was

used to name the strength of the relationship between variables and statistical significance was set at  $p < 0.05$ . The data were collected and analysed anonymously.

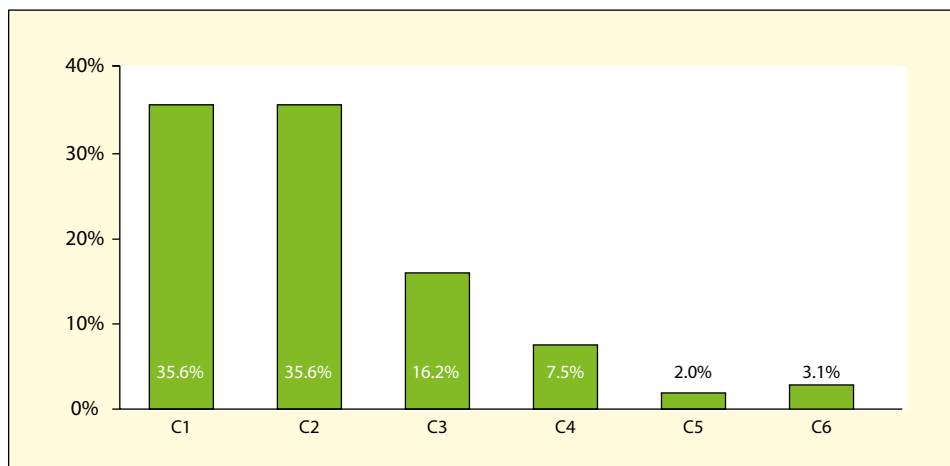
**RESULTS**

The survey was completed by 160 respondents. 147 (91.9%) participants were females and 13 (8.1%) were males, aged from 20 to 83 years [mean age  $\pm$  standard deviation (SD) =  $42.4 \pm 12.2$  years]. 77 (48.1%) individuals graduated from university, 71 (45.6%) reported secondary education, 6 (3.8%) were students, and 4 (2.5%) had primary education.

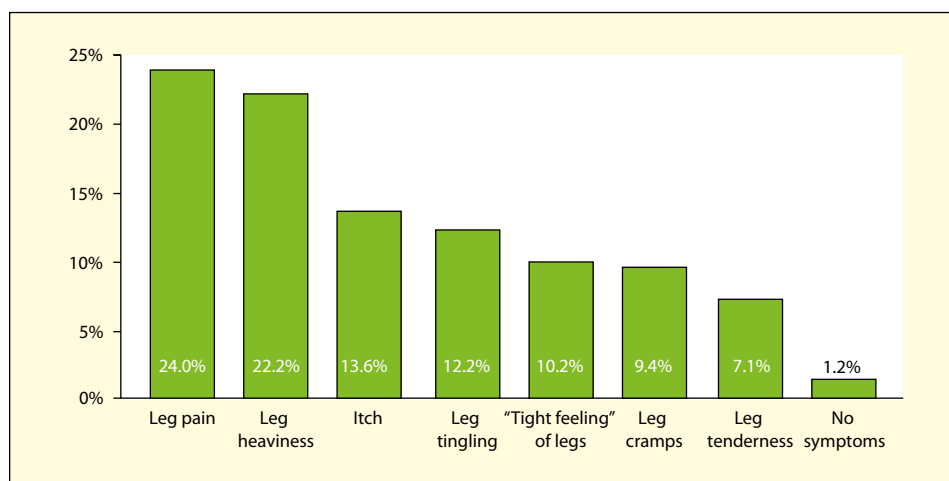
61 (38.1%) respondents had normal weight, 57 (35.6%) were overweight, 32 (20%) had obesity class I, 6 (3.7%) had obesity class II, 3 (1.9%) had obesity class III and one person (0.7%) was underweight. The mean BMI for the whole group was  $26.5 \pm 5.3$ . 69 (43.1%) volunteers described that in their work they mostly sit, 38 (23.7%) that they are mostly active, 30 (18.8%) that they mostly stand and 23 (14.4%) individuals are retired.

57 (35.6%) respondents stated that they have varicose veins (CEAP class 2), and 57 (35.6%) individuals that some thread and spider veins are noticeable (CEAP class 1). 26 (16.2%) volunteers suffered from oedema on lower legs due to varicose veins (CEAP class 3), 12 (7.5%) noticed some skin damage and hyperpigmentation due to varicose veins (CEAP class 4), 5 (3.1%) had venous leg ulcer (CEAP class 6) and 3 (2%) admitted having venous leg ulcer which is now healed (CEAP class 5) (Fig. 1).

Further, respondents were requested to describe their symptoms of CVD. It was possible to give more than one answer to this question. 118 (24%) respondents admitted leg pain, 109 (22.2%) leg heaviness, 67 (13.6%) itch, 60 (12.2%) leg tingling, 50 (10.2%) “tight feeling” of legs, 46 (9.4%) leg cramps, 35 (7.1%) leg tenderness and 6 (1.2%) individuals



**Figure 1.** Advancement of chronic venous disease due to Clinical–Aetiology–Anatomy–Pathophysiology (CEAP) Classification among respondents



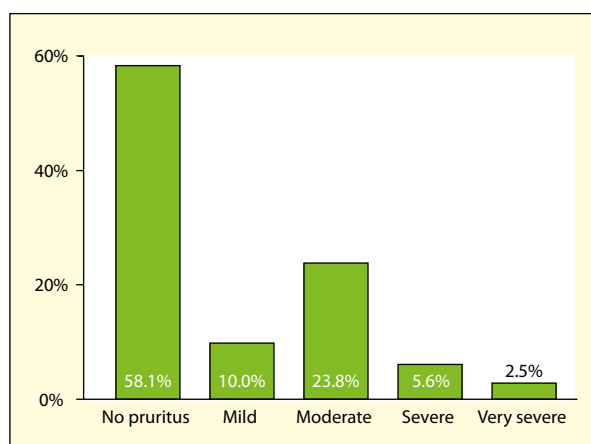
**Figure 2.** Symptoms of chronic venous disease among respondents

reported no symptoms (Fig. 2). The mean number of symptoms for the whole group was  $3.6 \pm 1.7$ .

This group of respondents who reported itch was asked to describe the intensity of it in the past 24 h using Pruritus NRS. Cut-off values proposed by Reich et al. [9] were used. 16 (10%) respondents reported mild pruritus ( $> 0 - < 3$  points in NRS), 38 (23.8%) moderate pruritus ( $\geq 3 - 7$  points in NRS), 9 (5.6%) severe pruritus ( $\geq 7 - 9$  points in NRS) and 4 (2.5%) very severe pruritus ( $\geq 9$  points in NRS) (Fig. 3). Pruritus was reported by 19 (33.3%,  $n = 57$ ) respondents with grade 1 of CVD according to CEAP classification, 26 (45.6%,  $n = 57$ ) individuals with grade 2, 7 (26.9%,  $n = 26$ ) volunteers with grade 3, 8 (66.6%,  $n = 12$ ) individuals with grade 4, 3 (100%,  $n = 3$ ) respondents with grade 5, and 4 (80%,  $n = 5$ ) patients with grade 6. The mean intensity of itch was  $4.4 \pm 2.4$ .

The CVD was diagnosed by a medical doctor among 147 (91.9%) respondents. Subsequently, volunteers were asked to describe what kind of treatment was administered. It was possible to give more than one answer to this question. Among 107 (49.3%) respondents compression treatment was used, by 73 (33.6%) volunteers pharmacological treatment was applied using preparations with diosmin, hesperidin and vitamin C, 16 (7.4%) individuals had laser therapy, 5 (1.4%) sclerotherapy and 3 (1.4%) vein stripping procedure. 13 (6%) respondents remained without treatment.

The mean CIVIQ-20 global score for all CEAP classes was  $50.1 \pm 17.7$ . Global scores for individual groups were: 46.1 for C1, 47.4 for C2, 54 for C3, 59.7 for C4, 76 for C5 and 67.2 for C6. For each class the mean number of symptoms, mean intensity of itch, and mean BMI were calculated (Tab. 1). BMI and global mean score of CIVIQ-20 almost gradually increased with increasing CEAP class. Such correlations between the advancement of CVD and increasing intensity of itch and the number of symptoms were not observed.



**Figure 3.** Self-assessment of pruritus according to the Pruritus Numerical Rating Scale (NRS) among respondents

To name the strength of the relationship between variables Pearson's correlation coefficient ( $r$ ) and cut-off values proposed by Chan [10] were used. A fair positive correlation ( $r > 0.3$ ) was found between:

- level of advancement of CVD and a global score of CIVIQ-20 ( $r = 0.332$ ,  $p < 0.001$ ),
- level of advancement of CVD and BMI ( $r = 0.345$ ,  $p < 0.001$ ), and
- number of symptoms and global score of CIVIQ-20 ( $r = 0.370$ ,  $p < 0.001$ ).

For all this data  $p$ -values were lower than 0.001 which means that they are strongly statistically significant (Tab. 2).

## DISCUSSION

CVD is a medical condition which is caused by venous valve malfunction. The prevalence of CVD is highest in Western countries and affects about 25% of the general population [11] consuming up to 2% of healthcare bud-

**Table 1.** Mean values of global CIVIQ-20 score, number of symptoms, pruritus intensity and BMI for each CEAP class among respondents

Class of CVD according to CEAP	C1	C2	C3	C4	C5	C6
Global mean score CIVIQ-20 ± SD	46.1 ± 17.2	47.4 ± 15.4	54.0 ± 19.4	59.7 ± 17.3	76.0 ± 7.9	67.2 ± 13.7
Mean number of symptoms ± SD	3.4 ± 1.8	3.5 ± 1.6	3.8 ± 1.6	3.6 ± 1.7	7 ± 0	3.8 ± 1.5
Mean pruritus intensity ± SD	4.8 ± 2.1	4.2 ± 2.4	3.6 ± 1.8	3.5 ± 2.8	7.0 ± 1.0	4.5 ± 3.0
Mean BMI ± SD	26.4 ± 4.7	26.4 ± 4.7	27.1 ± 5.0	26.5 ± 5.3	33.5 ± 3.9	34.7 ± 4.9

BMI — body mass index; CEAP — Clinical–Aetiology–Anatomy–Pathophysiology Classification; CIVIQ-20 — Chronic Venous Disease Quality of Life Questionnaire; CVD — chronic venous disease; SD — standard deviation

**Table 2.** Pearson's correlation coefficient (r) between particular variables and their p-values

Variable	Class of CVD according to CEAP	Global mean score CIVIQ-20	Mean number of symptoms	Mean pruritus intensity	Mean BMI
Class of CVD according to CEAP	–				
Global mean score CIVIQ-20	0.332 (p < 0.001)	–			
Mean number of symptoms	0.153 (p > 0.05)	0.370 (p < 0.001)	–		
Mean pruritus intensity	–0.013 (p > 0.05)	0.280 (p < 0.001)	0.160 (p < 0.001)	–	
Mean BMI	0.345 (p < 0.001)	0.117 (p > 0.05)	0.078 (p > 0.05)	0.049 (p > 0.05)	–

BMI — body mass index; CEAP — Clinical–Aetiology–Anatomy–Pathophysiology Classification; CIVIQ-20 — Chronic Venous Disease Quality of Life Questionnaire; CVD — chronic venous disease

gets [12]. CVD presents a wide spectrum of symptoms and the severity of it can be assessed with CEAP classification. Most of the respondents in the present study represented grades 1 and 2 according to the CEAP classification.

The pathophysiology of pruritus in CVD is complex. It is presumed that macromolecules leak into the tissues causing an inflammatory response, then it comes to fibrosis and skin damage which results in incessantly dry and flaky skin which in the end leads to pruritus [1, 13]. According to the current paper, 67 (41.9%) respondents reported the presence of itch, however, treatment of CVD was more focused on the pathophysiology of CVD and not particularly focused on this symptom. The intensity of pruritus ranged from 1.0 in CEAP class 3 to 3.6 in CEAP class 6, with the highest values in CEAP class 5 (7 in NRS). Further, no strong correlation between mean pruritus intensity and mean BMI values or the mean number of symptoms was found which can supposedly mean that the advancement of pruritus is independent of weight and severity of CVD. This seems to be confirmed in the literature. In the research of Duque et al. [14] 66% of patients with CVD had itch, but no correlation with the advancement of CVD according to CEAP classification was found. According to the present results intensity of the itch weak corresponds with the worsening quality of life ( $r = 0.280$ ,  $p < 0.001$ ). However, research by Duque et al. [14] denies it and reports a statistically significant negative relationship between itch intensity and health-related quality of life which was measured with the Skindex-16 questionnaire ( $r = 0.50$ ,  $p < 0.001$ ). This difference could supposedly come from the small sample size of individuals with pruritus in particular CEAP classes.

CIVIQ-20 was developed in France by Launois et al. [8] in France, and by then many articles were published proving their good relevance, acceptability, reliability, construct validity, and sensibility [15–17]. In the current study, the global scores of CIVIQ-20 well corresponded with higher CEAP classes and the mean number of symptoms. This means that CIVIQ-20 is a good tool to screen patients with CVD in terms of quality of life. In the paper of Sinožić et al. [18] the CVDs stages significantly correlated with BMI ( $r = 0.54$ ,  $p < 0.001$ ). In the present research poor correlation between the global score of CIVIQ-20 and BMI was found ( $r = 0.117$ ), however, this value was not statistically significant ( $p > 0.05$ ). In the literature, quality of life in patients with the CVD was also measured using, for example, classification and Venous Clinical Severity Score (VCSS) [19], Dermatology Life Quality Index (DLQI) [19], Skindex-16 questionnaire [14], Chronic Venous Disease Quality of Life Questionnaire (CIVIQ-14) [15], Venous Insufficiency Epidemiological and Economic Study — Quality of life/Symptom (VEINES-QoL/Sym) instrument [20, 21] or the Aberdeen Varicose Vein Questionnaire (AVVQ) [22]. This shows that there is a huge diversity of screening tools concerning quality of life among CVD patients which are available for daily practice. A great review paper by de Almeida et al. [23] was published which sums up the best instruments. According to them the CIVIQ-14, which is a shortened version of CIVIQ-20, and CIVIQ-20 have a good potential value for assessing quality of life in patients with CVD, and emerge as reliable and valid tools which could be used by clinicians.

The authors are aware of the obvious limitations of this study: overrepresentation of women, a small sample size

of patients with CEAP class 5 and 6 or possible misinterpretations of questions. The authors admit that patients could incorrectly describe their skin lesions and thus be classified in the wrong group according to the CEAP classification, however, every effort was made to provide reliable photos of skin lesions and add descriptions to them so that the results of this study are as credible as possible. Nevertheless, the current research was conducted on a relatively big research group (n = 160), which enables us to bring forward reliable conclusions.

## CONCLUSIONS

Clinicians should be aware that more than half of patients with CVD can suffer from itch, and that fact should be taken into consideration while applying treatment. To assess the quality of life of patients with CVD, CIVIQ-20 can be used in clinical practice regarding its fair correlation with the intensity and advancement of CVD.

## Article information and declarations

### Conflict of interests

The authors have no conflicts of interest to declare.

## REFERENCES

- Paul JC, Pieper B, Templin TN. Itch: association with chronic venous disease, pain, and quality of life. *J Wound Ostomy Continence Nurs.* 2011; 38(1):46–54, doi: [10.1097/won.0b013e318202c47a](https://doi.org/10.1097/won.0b013e318202c47a), indexed in Pubmed: [21287771](https://pubmed.ncbi.nlm.nih.gov/21287771/).
- Nicolaides AN, Labropoulos N. Burden and suffering in chronic venous disease. *Adv Ther.* 2019; 36(Suppl 1): 1–4, doi: [10.1007/s12325-019-0882-6](https://doi.org/10.1007/s12325-019-0882-6), indexed in Pubmed: [30758739](https://pubmed.ncbi.nlm.nih.gov/30758739/).
- Perrin M, Eklof Bo, VAN Rij A, et al. Venous symptoms: the SYM Vein Consensus statement developed under the auspices of the European Venous Forum. *Int Angiol.* 2016; 35(4): 374–398, indexed in Pubmed: [27081866](https://pubmed.ncbi.nlm.nih.gov/27081866/).
- Darvall KAL, Sam RC, Bate GR, et al. Changes in health-related quality of life after ultrasound-guided foam sclerotherapy for great and small saphenous varicose veins. *J Vasc Surg.* 2010; 51(4): 913–920, doi: [10.1016/j.jvs.2009.11.045](https://doi.org/10.1016/j.jvs.2009.11.045), indexed in Pubmed: [20347688](https://pubmed.ncbi.nlm.nih.gov/20347688/).
- Kłudkowska J, Nowicki R. The impact of atopic dermatitis on patients' and their families' quality of life. *Alerg Astma Immunol.* 2013; 18(1): 21–24.
- Eklöf Bo, Rutherford RB, Bergan JJ, et al. American Venous Forum International Ad Hoc Committee for Revision of the CEAP Classification. Revision of the CEAP classification for chronic venous disorders: consensus statement. *J Vasc Surg.* 2004; 40(6): 1248–1252, doi: [10.1016/j.jvs.2004.09.027](https://doi.org/10.1016/j.jvs.2004.09.027), indexed in Pubmed: [15622385](https://pubmed.ncbi.nlm.nih.gov/15622385/).
- Phan NQ, Blome C, Fritz F, et al. Assessment of pruritus intensity: prospective study on validity and reliability of the visual analogue scale, numerical rating scale and verbal rating scale in 471 patients with chronic pruritus. *Acta Derm Venereol.* 2012; 92(5): 502–507, doi: [10.2340/00015555-1246](https://doi.org/10.2340/00015555-1246), indexed in Pubmed: [22170091](https://pubmed.ncbi.nlm.nih.gov/22170091/).
- Launois R, Reboul-Marty J, Henry B. Construction and validation of a quality of life questionnaire in chronic lower limb venous insufficiency (CIVIQ). *Qual Life Res.* 1996; 5(6): 539–554, doi: [10.1007/BF00439228](https://doi.org/10.1007/BF00439228), indexed in Pubmed: [8993100](https://pubmed.ncbi.nlm.nih.gov/8993100/).
- Reich A, Chatzigeorkidis E, Zeidler C, et al. Tailoring the cut-off values of the visual analogue scale and numeric rating scale in itch assessment. *Acta Derm Venereol.* 2017; 97(6): 759–760, doi: [10.2340/00015555-2642](https://doi.org/10.2340/00015555-2642), indexed in Pubmed: [28224165](https://pubmed.ncbi.nlm.nih.gov/28224165/).
- Chan YH. *Biostatistics 104: correlational analysis.* Singapore Med J. 2003; 44(12): 614–619, indexed in Pubmed: [14770254](https://pubmed.ncbi.nlm.nih.gov/14770254/).
- Rabe E, Berboth G, Pannier F. [Epidemiology of chronic venous diseases]. *Wien Med Wochenschr.* 2016; 166(9–10): 260–263, doi: [10.1007/s10354-016-0465-y](https://doi.org/10.1007/s10354-016-0465-y), indexed in Pubmed: [27277219](https://pubmed.ncbi.nlm.nih.gov/27277219/).
- Davies AH. The seriousness of chronic venous disease: a review of real-world evidence. *Adv Ther.* 2019; 36(Suppl 1): 5–12, doi: [10.1007/s12325-019-0881-7](https://doi.org/10.1007/s12325-019-0881-7), indexed in Pubmed: [30758738](https://pubmed.ncbi.nlm.nih.gov/30758738/).
- Burrows C, Miller R, Townsend D, et al. Best practice recommendations for the prevention and treatment of venous leg ulcers: update 2006. *Adv Skin Wound Care.* 2007; 20(11): 611–21; quiz 622, doi: [10.1097/01.ASW.0000284937.32707.c4](https://doi.org/10.1097/01.ASW.0000284937.32707.c4), indexed in Pubmed: [17975369](https://pubmed.ncbi.nlm.nih.gov/17975369/).
- Duque MI, Yosipovitch G, Chan YH, et al. Itch, pain, and burning sensation are common symptoms in mild to moderate chronic venous insufficiency with an impact on quality of life. *J Am Acad Dermatol.* 2005; 53(3): 504–508, doi: [10.1016/j.jaad.2005.04.079](https://doi.org/10.1016/j.jaad.2005.04.079), indexed in Pubmed: [16112363](https://pubmed.ncbi.nlm.nih.gov/16112363/).
- Radak DJ, Vlajinac HD, Marinković JM, et al. Quality of life in chronic venous disease patients measured by short Chronic Venous Disease Quality of Life Questionnaire (CIVIQ-14) in Serbia. *J Vasc Surg.* 2013; 58(4): 1006–1013, doi: [10.1016/j.jvs.2011.08.003](https://doi.org/10.1016/j.jvs.2011.08.003), indexed in Pubmed: [22051876](https://pubmed.ncbi.nlm.nih.gov/22051876/).
- Lozano FS, Launois R. Reflux Assessment and Quality of Life Improvement with Micronized Flavonoids (RELIEF) Spanish group. Quality of life (Spain and France): validation of the chronic venous insufficiency questionnaire (CIVIQ). *Methods Find Exp Clin Pharmacol.* 2002; 24(7): 425–429, doi: [10.1358/mf.2002.24.7.696544](https://doi.org/10.1358/mf.2002.24.7.696544), indexed in Pubmed: [12428431](https://pubmed.ncbi.nlm.nih.gov/12428431/).
- Biemans AAM, van der Velden SK, Bruijninx CMA, et al. Validation of the chronic venous insufficiency quality of life questionnaire in Dutch patients treated for varicose veins. *Eur J Vasc Endovasc Surg.* 2011; 42(2): 246–253, doi: [10.1016/j.ejvs.2011.04.007](https://doi.org/10.1016/j.ejvs.2011.04.007), indexed in Pubmed: [21531589](https://pubmed.ncbi.nlm.nih.gov/21531589/).
- Sinožić T, Baždarić K, Šverko D, et al. Validation of the Croatian version of CIVIQ quality of life questionnaire in patients with chronic venous disorders. *Croat Med J.* 2017; 58(4): 292–299, doi: [10.3325/cmj.2017.58.292](https://doi.org/10.3325/cmj.2017.58.292), indexed in Pubmed: [28857522](https://pubmed.ncbi.nlm.nih.gov/28857522/).
- Poulose D, Deo K, Gogineni JM, et al. Correlation of venous clinical severity score with dermatology life quality index among patients with chronic venous insufficiency: a cross-sectional study. *Cureus.* 2021; 13(9): e17654, doi: [10.7759/cureus.17654](https://doi.org/10.7759/cureus.17654), indexed in Pubmed: [34650843](https://pubmed.ncbi.nlm.nih.gov/34650843/).
- Ribeiro-Samora GA, Carvalho ML, de Moura RM, et al. Limitations of VEINES QOL/SYM for discriminating chronic venous insufficiency severity. *J Vasc Bras.* 2019; 19:e20180096, doi: [10.1590/1677-5449.180096](https://doi.org/10.1590/1677-5449.180096), indexed in Pubmed: [31839797](https://pubmed.ncbi.nlm.nih.gov/31839797/).
- Bland JM, Dumville JoC, Ashby RL, et al. Validation of the VEINES-QOL quality of life instrument in venous leg ulcers: repeatability and validity study embedded in a randomised clinical trial. *BMC Cardiovasc Disord.* 2015; 15: 85, doi: [10.1186/s12872-015-0080-7](https://doi.org/10.1186/s12872-015-0080-7), indexed in Pubmed: [26260973](https://pubmed.ncbi.nlm.nih.gov/26260973/).
- Klem TM, Sybrandy JEM, Wittens CHA, et al. Reliability and validity of the Dutch translated Aberdeen Varicose Vein Questionnaire. *Eur J Vasc Endovasc Surg.* 2009; 37(2): 232–238, doi: [10.1016/j.ejvs.2008.08.025](https://doi.org/10.1016/j.ejvs.2008.08.025), indexed in Pubmed: [18993090](https://pubmed.ncbi.nlm.nih.gov/18993090/).
- de Almeida IL, Figueiredo PH, Silva WT, et al. Reliability and validity of specific quality of life assessment questionnaires related to chronic venous insufficiency: a systematic review. *J Vasc Bras.* 2022; 21:e20210229, doi: [10.1590/1677-5449.202102292](https://doi.org/10.1590/1677-5449.202102292), indexed in Pubmed: [36407663](https://pubmed.ncbi.nlm.nih.gov/36407663/).