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## **Aspects Related to Venous Ulcer Healing and its Influence on Quality of Life**

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### **Abstract**

Nowadays, the varicose ulcers (VUs) are one of the most worrying leg ulcers and are an important global health problem, with high costs related to the treatment and its complications. Moreover, the quality of life (QOL) of the patient could be affected by pain, sleep disorders, functional impairment, depression, and isolation. The VU patient care is complex, and it is necessary to know the aspects that contribute to the healing process for developing effective strategies. The members of the multidisciplinary health team should identify sociodemographic, clinical, and care aspects that interfere in tissue repair and therefore impacting the QOL. Self-efficacy, adherence to treatment, and self-esteem are other important aspects also related to healing and QOL, with implications for health care and the multidisciplinary team. To sum up, the use of multidisciplinary protocols allows the systematization of care for people with VUs in order to standardize therapeutic interventions with the aim to decrease the healing process time and, as a consequence, to improve the QOL.

**Keywords:** wound healing, varicose ulcer, quality of life, self-efficacy, self-concept

## 1. Introduction

This chapter discusses the aspects related to the healing of venous ulcers (VUs) and its influence on quality of life (QOL), using studies developed in recent years in the Brazilian research group called Nursing Procedures's Incubator Research Group (GPIPE – CNPq) as the main assumptions and corroborating with other national and international references. The understanding of the physiology of a healing chronic wound, as well as the pathophysiology of chronic venous insufficiency (CVI) is fundamental. This is the beginning for the ulceration, allowing members of the multidisciplinary health team to identify sociodemographic, clinical, and care aspects that interfere, directly or indirectly, in tissue repair and therefore impacting the QOL. Other important aspects such as self-efficacy, adherence to treatment, and self-esteem are also related to healing and QOL with implications for health care and the multidisciplinary team.

## 2. Contextualization of venous ulcer and quality of life

VU is the main lesion of the lower limbs, with an approximate prevalence between 80 and 90%. It is caused by CVI, having an irregular shape, with defined edges, usually located in the perimalleolar region. It is usually limited to the subcutaneous tissue; however, the secondary infection can produce profound destruction of soft tissues [1].

As a chronic wound, it needs prolonged and expensive treatment for the health system and the individual. The healing process has steps that differ from normal wounds and can remain open for a long period. Some of the factors associated with changes in healing are aging, overweight/obesity, nonadherence to compression therapy, extensive, and infection injury area.

People with VU commonly live with chronic pain that can affect the autonomy in carrying out daily activities, decreasing self-esteem, causing social isolation, and depression and thus, interfering in all dimensions of life. It also has a considerable socioeconomic impact due to treatment costs and loss of working days, with the possibility of early retirement.

The World Health Organization (WHO) defines QOL as “the individual's perception of his position in life in the context of culture and value systems in which they live, and about their goals, expectations, standards, and concerns” [2].

There are several generic or specific instruments, which may be used in the evaluation of the person's QOL with VU, such as EuroQol 5 dimensions (EQ-5D), Short Form Health Survey-12 (SF-12); Short Form Health Survey (SF-36), Short Form 6 dimensions (SF-6D), Chronic Venous Insufficiency Quality of Life Questionnaire (CIVIQ), Cardiff Wound Impact Schedule (CWIS), and Charing Cross Venous Ulcer Questionnaire (CCVUQ).

Thus, its evaluation is important for the understanding of its influence on the healing process and develops effective and secure strategies by health professionals for a comprehensive approach to the patient. The care planning requires the involvement and training of the multidisciplinary team to identify the needs of this population and adequate guidance.

### **3. Healing physiology and pathophysiology of chronic venous insufficiency and arising of venous ulcers**

Healing can be understood as a range of metabolic reactions by the loss of skin integrity, which aim to restore the damaged tissue. The stages of this process are inflammatory or exudative, proliferative, and maturation, resulting in scar formation. The duration of these stages is variable and influenced by factors such as ischemia or poor nutrition and immunosuppression [3].

The chronic wound comes from any cause that delays and prolongs the healing and infection, and local irritation may be associated with this delay. Some theories attempt to explain the extended time, either by excessive degradation of the cell matrix, reduction of proinflammatory mediators or immature fibroblasts. Thus, usually, the re-epithelialization and remodeling of damaged tissue are delayed stages [3].

The CVI is a progressive and debilitating condition that can result in a chronic wound. Vascular and rather a complex origin, it involves etiological multiplicity changing the morfofunctional veins and their valves, compromising the blood flow of the lower limbs [4]. In general, the CVI is a wide range of clinical manifestations of chronic venous disease (CVD) [5].

The development of venous pathology is related to increased venous pressure and impaired blood return of the legs through mechanisms, such as the inefficiency of the calf muscle, venous hypertension, the incompetence of the perforating veins that connect the superficial and deep venous system and failure of the valves, causing blood reflux. Among the factors that determine damage on the veins, there are inflammation, trauma, thromboembolism, surgery, and comorbidities such as obesity, high blood pressure (hypertension), and diabetes [4, 5].

These changes bring several clinical manifestations, from heaviness to ulceration with severe pain. The most common signs and symptoms are dry and irritated skin, itching, swelling, and heaviness in the legs, spatially at the end of the day and typical pain that improves when raising members and it worsens when they are midair and may interfere with ambulation [4]. There are also telangiectasias, varicosities, hyperpigmentation, eczema, lipodermatosclerosis, active or healed ulcers observed [5].

Prolonged venous hypertension associated with valvular incompetence and calf muscle dysfunction promotes microcirculation changes of the lower limbs, resulting in skin changes. The dysfunction of the deep venous system valves is associated with disease progression and VU formation [5].

The red blood cells in the extravascular space, as a result of venous stasis, have a decomposition with consequent release of hemosiderin that causes hyperpigmentation. Furthermore, there may be fibrous tissue deposition in the subcutaneous tissue, resulting in the lipodermatosclerosis. These tissue changes associated with constant venous pressure and blood stasis predisposes to ulceration.

Many additional tests such as ultrasound, Doppler, and angiography, are employed to assist in the diagnosis of CVI and evaluate the venous return. However, there is no diagnostic test

that can predict accurately the appearance of VU, which is usually associated with triggering factors such as cellulitis, trauma, dermatitis or skin irritation, insect bites, burns, sudden onset of edemas [4].

VU not showing signs of healing for a time greater than 4–6 weeks may be considered chronic, predisposing to infection, bad odor and pain. Among the reasons for the chronicity of the injury, there is the high concentration of neutrophils that secrete proteases and inhibit the growth factors. Moreover, the presence of fibrin, leukocytes, and microangiopathy contribute to chronic inflammation resulting in changes in the microcirculation, delaying the injury closing. Therefore, infection and antibiotic therapy, topical or systemic, long and low adherence to compression therapy are related to a worse prognosis [4].

VU treatment objectives are the reduction of pain, exudate, odor, and necrotic tissue to prevent the onset of infection. The main interventions are: raising the legs, physical exercise, compression therapy, and the use of dressing coverage [4].

Compressive therapies represent the gold standard treatment for CVI and VU promoting the reduction of venous stasis limiting the distention of the veins and aid in the function of the calf pump. They are contraindicated only in the presence of arterial insufficiency, cellulitis, and decompensate heart failure. Raising the legs is a simple intervention that assists in reducing edema, promoting venous return [4].

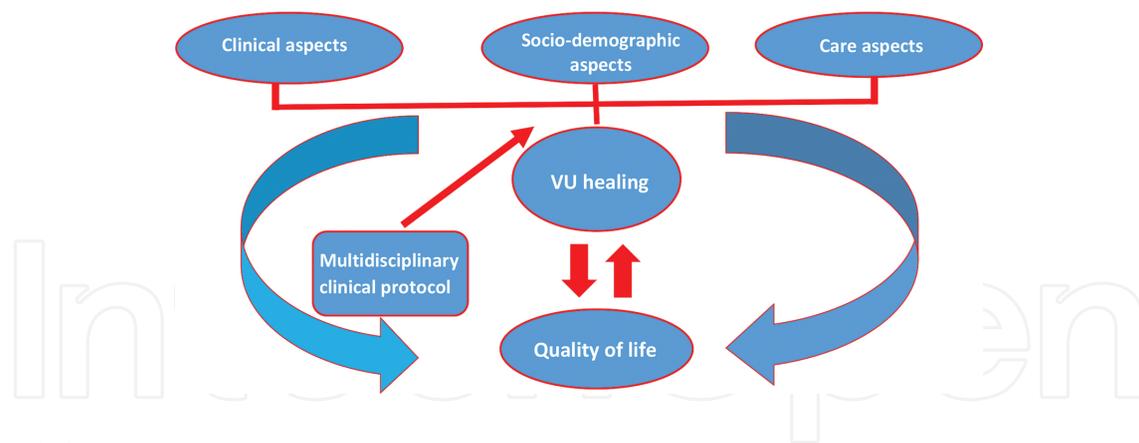
The selection of dressing coverage should consider the injury characteristics (tissue, exudate, odor, infection), the patient's needs, such as comfort and allergy, the result of the cost-benefit, and ease of application [4].

Therefore, the participation of a multidisciplinary health team planning and executing comprehensive care is critical. In this team, the nurse plays an essential role in the early identification of manifestations of CVI and the rapid and efficient development of actions that interfere with the progression of the disease and the occurrence of relapses, promoting quality of life [4].

In the case of systematic nursing care for people with VU, a study identified in more than half of the participants, the following factors related to the nursing diagnosis of the North American Nursing Diagnosis Association (NANDA) Impaired tissue integrity: impaired circulation, knowledge deficit, chemical irritants, excess fluids, and nutritional factors [6].

#### **4. Sociodemographic, clinical, and care influence in the healing of venous ulcer and quality of life**

As a thought, VU healing receives multifactorial influence beyond the biological aspects. Sociodemographic, clinical, and care characteristics are directly related to this process, also modifying the QOL (Figure 1).



**Figure 1.** Proposition model of the relationship between the variables interfering with venous ulcer healing and quality of life.

The demographic characteristics of people with VU are similar worldwide. Females, elderly, often with low education, and income are predominant [7–11].

Women are more affected because they are more prone to developing CVI, either for their hormonal activity, the number of pregnancies or even genetic factors. The increase with aging is justified by the incompetence of venous valves, dysfunction of the calf pump due to decreased muscle strength, together with the fragility of the skin, common characteristics in this population.

The low level of education hinders to understand the clinical situation and in promoting health through self-care due to lack of knowledge regarding ulceration, resulting in the absence of lifestyle changes [12, 13].

Income constitutes an important factor because of the high costs of dressing coverage, use of compression therapy, and other care favoring the financial imbalance, often aggravated by leaving the labor activity.

Concerning to clinical and health, the presence of other chronic diseases with CVI, as SAH and DM, as well as health habits, including sleep patterns, alcohol consumption, and smoking are related to the VU healing process.

Diseases such as SAH and DM directly influence blood circulation and healing capacity. Studies show the prevalence and association of these diseases in people with VU [14, 15], which makes them difficult aspects of healing. The hypertension is often associated with atherosclerosis and Diabetes can lead to complications in the skin as a result of neuropathy, also, to often be associated with peripheral arterial disease, making the stabilization of the injury.

Habits such as drinking alcohol and smoking influence the metabolism of the skin, impairing the VU healing process. Nicotine has vasoactive effects, decreasing blood flow, and consequently the amount of oxygen in the tissues [16]. Alcohol drinking is often associated with bad health habits and self-care, damaging the wound closure.

In individuals with VU, one of the clusters symptoms found is the sleep disorder and usually is related to chronic pain, and sleep good quality is essential to strengthen the mental and physical health [17].

Pain is common in this population, with a prevalence of 80–96% of cases. Moreover, it causes physical, emotional and social limitations and tends to be intensified at the time of dressing change or compression therapy [18–20].

In northeastern Brazil, the presence of pain affects QOL and can negatively influence wound healing, being present in 86% of patients [11]. Pain stimulates the release of inflammatory mediators that interfere with repair tissue [21] and, when severe, it can be related to local infection, increasing healing time.

The consequent prolonged injury time also influences the healing and consequently the quality of life. When investigating the association between the VU time, there was worst mean on those people over 1 year of injury, and the emotional state and aesthetics were significantly affected [15]. In another study, the risk factors and pathological personal antecedents were more present in people with treatment time greater than 1 year [22].

As already known, the characteristics of the lesion are directly related to healing. Great and depth injuries with necrosis, lot of fibrin, little granulation tissue, purulent exudate and foul odor naturally lead to a longer time to complete closure.

Care aspects are also directly related to the healing process. Appropriate care has the participation of a multidisciplinary team, preferably with the adoption of protocols, technical skills, and specific knowledge of patient's assessment and injury [10].

The choice and access to the coverage consistent with the tissues shown in the injury as well as the use of compression therapy by the level of vascular insufficiency are aspects of the service that stand out for facilitation of wound healing.

Various therapies may be used together with compression therapy. An almost experimental study with lymphotherapy implementation and compression therapy showed that the intervention group reduced pain and edema, and significantly improve VU healing, confirming the benefits of this treatment [23].

In Brazil, it is very common to use medicinal plants. In general, this care happens before seeking health services or in a complementary way to professional practices. Nursing needs to identify the influence of this popular knowledge in the care of people with venous ulcer [24].

Furthermore, the location for the dressing also can influence this process. In countries with advanced health practices, the dressings are performed in specialized clinics, while in others, they are done at home, often by the individuals with VU or their families/caregivers. This kind of behavior does not allow adequate assistance and contamination-free that can lead to infections in the lesion.

Often, the resolute treatment of people with VU is done by professionals with expertise in the area or with extensive experience. To direct, organize, and unify the assistance, the use of

protocols is adopted in different settings in the world to reduce the working time and also healing time [25].

It is also important that health professionals record the clinical findings to ensure legal support for the assistance provided, and give continuity of care between professionals and health care levels.

## **5. Interrelationship among quality of life, self-efficacy, adherence to treatment, self-esteem, and healing of venous ulcer**

All factors mentioned above are related to wound healing and therefore to QOL, which is also an influencing agent (**Figure 1**).

This construct is a very common research object in many areas, especially health. Its study related to chronic diseases enables to identify specifics for assessing and proposing new interventions and treatments [9]. Its evaluation in health care is part of the search for a comprehensive view of the individual, who can consider all aspects that may influence the VU healing and the person's QOL.

The QOL of people with VU has already been investigated worldwide because being a chronic wound characteristic, individuals live long with it, and it influences on all aspects of life.

Physical problems are the most issues influencing in this construct, because the injury imposes limitations for various day-to-day activities, and the individual becomes dependent on others. Bathing, dressing, walking, using public transport, performing household activities or activities requiring a little more physical strength become almost impossible for those who live with a VU [10, 26].

Due to the physical limitations arising, these people often become unable to work and help the family income. Depending on the country, in some cases, there is early retirement or benefits by social security.

Regarding the social environment and mental health, the characteristic symptoms of the ulcer as pain, possible fetid odor, lots of exudates, the appearance of dressings, and bandages change the perception of themselves, leading to psychological and social problems. Family relationships between friends and work are affected significantly. Frequenting public places become a dilemma for those people who are concerned about the discomfort they may cause to others [27]. Sexual relationships are also affected, a fact little researched in the scientific area [10, 28].

Thus, support for people with VU, in the various spheres of life is essential and therefore social networks bring benefits to treatment. A qualitative study in southern Brazil, built the following categories: the family is concerned with; I had a lot of help from friends and neighbors, and I do by myself, pointing to the need of the multidisciplinary team, through nursing, knowing this social network and working together with it to strengthen the partnership in care [29].

These findings corroborate another qualitative study that showed the influence of injury in the family and occupational relationships, through three categories: venous ulcer and its impact

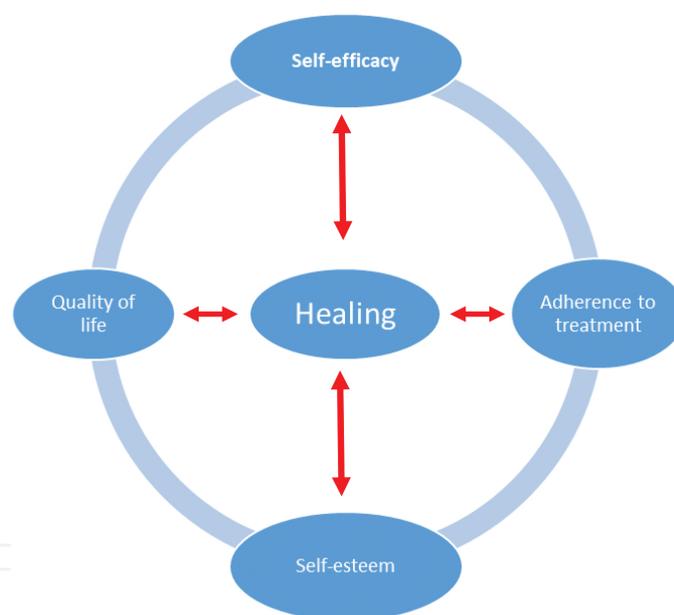
at work; changes in routine and restrictions on living with venous ulcers; and living with venous ulcers and the need for professional and family care [30].

Another study also developed in southern Brazil composed other categories showing treatment strategies: self-treatment, seek the health service, and religious for pain relief. Study participants reported using simple strategies but limited to pain relief, indicating a gap in care [30].

Therefore, there is an emotional burden that affects aspects related to mental health, emerging feelings of helplessness, coping difficulties, lack of hope with the healing also affecting the set of difficulties in activities of daily living and social isolation [31].

It is noticed that there is an interaction of factors mutually cause and effect impairments in QOL. Physical problems are reflected in the social and mental aspects and vice versa, creating a vicious cycle.

Other constructs with QOL and healing are also investigated, including self-efficacy, adherence to treatment and self-esteem. **Figure 2** demonstrates this interrelationship.



**Figure 2.** Proposition model of the relationship between the constructs affecting the quality of life and the healing of venous ulcers.

The belief of self-efficacy originated in the Cognitive Social Theory, is the evaluation of what the individual do by himself, based on human motivation, on his ability to perform some activity despite the problems. Thus, self-efficacy is predictive of behavior, which may affect the adaptation and changes in the problems [32, 33].

People acquire beliefs about their abilities from the vicarious experience, social persuasion, somatic and emotional states, and domain experience [33]. Vicarious experience arises from the observation of other people performing tasks [34]. Social persuasion is accomplished

through verbal judgments that others do. Somatic and emotional states are anxiety and stress levels influencing the self-confidence level. Finally, the domain experience is obtained from the interpretation of previous actions of the individual [32].

With this understanding, it becomes easy to see how self-efficacy can influence and at the same time be influenced by QOL in people with VU. The existence of injury requires self-care actions such as raising lower limbs, the use of compression therapy and regular physical exercise. These activities will be more effect in people with high self-efficacy, promoting healing, because they interpret the difficult tasks as challenges to be faced, and not as threats to be avoided [33, 34].

The relationship between self-efficacy and chronic diseases is considerably explored, but not specifically at people with VU. However, there is a relationship of self-efficacy with compression therapy and significant association between low self-efficacy and increased risk of recurrence of ulcers [12, 35].

In this sense, self-efficacy is highlighted to improve self-care, QOL, and promoting tissue repair. Professionals can intervene through stimuli to changes in lifestyle, monitoring emotional responses and empowerment for the disease, reducing hopelessness [12, 34, 36].

Therefore, it is necessary to adapt the patients with VU to their new condition of life that affects the mental, physical and social well-being, and generates the search for new skills including values review, knowledge about the disease, adaptation to treatment and facing the society.

With the strong psychosocial impact in this population, health professionals must hold a special care that may reflect an improved QOL, patient's adherence, and self-esteem, providing a high self-efficacy [37, 38].

Therefore, the importance of self-efficacy interference in treatment adherence is highlighted. In a study, it was identified that the level of psychosocial adaptation of these people is low due to the difficulty in treatment adherence, contributing to the chronic nature of these injuries, further compromising QOL [10].

Thus, determined people who are actively involved in the treatment and persist in their goals have high self-efficacy and adapt more easily to their limitations, with a greater chance of success in the faster treatment reestablishment of the physical and psychosocial balance. On the other hand, people with low self-efficacy tend to drop out more easily when not succeed in a particular task, while people with high self-efficacy are more persistent to achieve their goals. Low self-efficacy causes the individual quitting daily activities, social and leisure activities [39].

Therefore, prevention and treatment of VU can be achieved through actions for self-care and self-management programs enable the individuals to manage their health condition regardless of health professionals [40, 41].

Moreover, before that, the therapy adherence is important for people with VU, significantly reducing the healing time, decreasing recurrence rates, and positively influencing QOL [42]. However, it is still a significant problem among people with VU, since the presence of the lesion requires a long, costly treatment, and changes in lifestyle.

Despite the treatment adherence is a problem that deserves the attention of researchers, there are few studies of this nature with the population with VU. In the national context, most studies are done with patients with other chronic diseases.

In a literature review conducted between 2007 and 2012, 69.2% of the studies found a significant relationship between treatment adherence and QOL, but the causality of the phenomenon could not be set. Even on those with no statistical significance, this relationship was positive [43].

Studying the behavior of the patients to treatment is important to understand better the chronic sick person, revealing his greatest difficulties, increasing knowledge about these diseases. Thus, analyzing the phenomenon of adherence is critical to improving health policies and practices aimed at improving the treatment given to the person with VU.

In Brazil, the individual lives with the wound for years. First, because the sociodemographic conditions have disadvantages compared to other countries, and also by the difficult adherence to compression therapy, which also occurs by social issues, as stated earlier. Moreover, the very hot climate of the region does not favor treatment adherence. As there seems to be an effective work of awareness and promotion of compression therapy, treatments are long lasting, expensive and affecting QOL.

Also, high self-esteem acts as a protective factor alleviating the complications related to chronic venous diseases. Thus, damage to self-esteem may adversely affect recovery [44]. In this perspective, evaluating the quality of life and self-esteem is something that has become important in recent decades, specifically, the QOL of patients with venous ulcers, since it is an important indicator of the evolution of response of wound healing [45].

Self-esteem is the personal assessment of the abilities expressed by approving or disapproving attitudes toward himself. This assessment can be carried out globally through the instrument called Rosenberg Self-Esteem Scale [46]. In a recent dissertation, there was a negative and significant correlation between SE of people with VU and domains and dimensions of the SF-36 [47].

## **6. Implications for health care and the multiprofessional team**

From the reflections on the aspects of VU healing and its influence on QOL, the role of health professionals to work in this field is highlighted in this topic.

It is pointed out the relevance of the multidisciplinary health team performance in the multidimensional approach to this population to promote better health outcomes to this population through interventions such as topical therapy, systemic treatment of circulatory conditions, minimizing the impact of injury on self-image, self-esteem, pain management, among others, considering venous ulcer as a chronic injury, recurrent and having a biopsychosocial impact [38, 48, 49].

In this sense, knowing the aspects that impact the QOL of people with VU allows health professionals, especially nurses, incorporating them into the planning of assistance through

interventions that help wound healing. It appears that knowing the situation of individuals, physical and clinical aspects and repercussions on the psychosocial dimensions, nurses can plan actions that meet the care needs to promote better health [38, 49]. Interventions according to clinical presentation and monitoring through systematic evaluation methods are needed [49].

Dressings made by the patients require monitoring and training, to consider aspects of specificity, such as the location of the ulcer, preparation, and receptivity to making the bandage at his home [50, 51]. Thus, the decentralization of care runs through the availability of health staff, especially nurses to conduct training by the treatment cost-benefit and characteristics of the person affected, and each wound [51].

However, there is a weak knowledge and management of nonspecialist nurses on appropriate therapies for the use of topical therapy in the treatment of venous ulcers. The organization and planning of care for nurses are based on the assessment of the ulcer characteristics, as well as the comprehensive approach to people with venous ulcer treatment. By using protocols for topical treatment of VU, it is expected to standardize care, reducing costs and optimizing the nurse's time. Thus, the development of protocols can assist nurses in decision-making on topical therapy [52].

The multidisciplinary protocols allow the systematization of care for people with VU to standardize therapeutic interventions and ensure the continuity of monitoring at various levels of health care. Thus, the healing time and the improvement of QOL decrease [10].

Thus, before the studies in Brazil and discussion with other references throughout this chapter, it is pointed out the need to adopt effective measures that seek to ensure the improvement of QOL of people with VU through a care based on evidence and favoring the integrity of the individual in care.

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