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SELF-CARE FOR THE TREATMENT OF LEG ULCERS IN SICKLE CELL ANEMIA: NURSING GUIDELINES

O autocuidado para o tratamento de úlcera de perna falciforme: orientações de enfermagem

El autocuidado para el tratamiento de úlcera de la pierna falciforme: orientaciones de enfermería

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ABSTRACT

This study's objective was to verify the effectiveness of a Self-Care Program throughthe progression of the healing process of leg ulcers in sickle-cell anemia. This is a longitudinal study with a quantitative approach conducted with 40 patients in the sectorof wound dressing of a public health institution specialized in hematologic treatment located in Rio de Janeiro, Brazil. An instrument was used to collect data and wasapplied during nursing consultations. Data were analyzed using Cox models, logistic regression and classification trees. The effectiveness of the self-care program was verified according to the complete healing of the ulcers of 23 patients. We observed that acute ulcers with a duration of up to 60 months presented a 95% chance of cure. Due to the adherence of patients and results achieved, the program was established as a therapeutic modality and was incorporated as an institutional program.

Keywords: Sickle cell anemia; Leg ulcer; Nursing; Self Care.

RESUMO

O objetivo deste estudo foi verificar a eficácia do Programa do Autocuidado, pela progressão do processo cicatricial de úlcera da perna falciforme. Trata-se de um estudo longitudinal com abordagem quantitativa realizado com 40 clientes no setor de curativos de uma instituição de saúde pública, especializada no tratamento hematológico, situada no Rio de Janeiro. Para a coleta dos dados foi utilizado um instrumento aplicado no momento das consultas de enfermagem. Os dados foram analisados com o auxílio dos modelos de Cox, regressão logística e árvores de classificação. Verificou-se a eficácia do Programado Autocuidado em função da cicatrização total das ulcerações de 23 clientes, e observou-se que úlceras agudas com um tempo de manifestação até 60 meses têm a probabilidade de cura de 95%. A partir da adesão dos clientes e dos resultados alcançados, o programa firmou-se como modalidade terapêutica, sendo incorporado como programa institucional.

Palavras-chave: Anemia falciforme; Autocuidado; Enfermagem; Úlcera da perna.

RESUMEN

El estudio tuvo por objetivo comprobar la eficacia del Programa de Autocuidado por progresión del proceso de curación de úlcera de la pierna falciforme. Estudio longitudinal, con enfoque cuantitativo, llevado a cabo con 40 clientes del sector curativo de una institución de salud pública especializada en el tratamiento hematológico, ubicada en Rio de Janeiro. Para recolectar los datos, se utilizó un instrumento aplicable en el momento de las consultas de enfermería. Los datos fueron analizados utilizando los modelos de Cox, regresión logística y árboles de clasificación. El programa aumentó la curación total de las úlceras de 23 clientes; y se observó que las úlceras agudas con un tiempo de inicio hasta 60 meses tienen probabilidad de un 95% de cura. Tras la adhesión de los clientes del programa, se ha consolidado como una modalidad terapéutica, incorporado como Programa Institucional.

Palavras-clave: Anemia de células falciformes; Autocuidado; Enfermería; Úlcera de la pierna.

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INTRODUCTION

Sickle cell anemia in the context of Public Health Policies

Sickle cell disease is one of the most frequent genetic diseases in Brazil. Its cause is a mutation of the beta-globin gene that originates abnormal hemoglobin called hemoglobin S (HbS), which replaces hemoglobin A (HbA) in affected individuals. Sickle-cell anemia is a form of sickle cell disease that occurs in homozygotes (SS)[1].

Sickle-cell anemia is a chronic disease with a clinical course marked by acute episodes and characterized by numerous complications that may affect almost all organs and systems, with significant morbidity, reduced expectancy and quality of life. In addition to the manifestations of chronic anemia, the condition is dominated by pain episodes, infections and pulmonary infarcts, delayed growth and sexual maturation, stroke, leg ulcers, among others[2]. Therefore, patients face the disease, the symptoms and complications secondary to the disease, requiring regular and careful clinical follow-up[2,3].

Clinical signs result from sickle-shaped red blood cells that intensely affect microcirculation blood flow since the irregular contact surface of changed red blood cells cause interactive chemical reactions between red blood cells and endothelial cells, which adhere to the blood vessel. The consequences of such adherence are characterized by vessel occlusion and reduced blood flow in the capillaries, causing venous stasis and hypoxemia leading to acute painful crises and chronic and progressive tissue damage[3].

The sickle-cell disease is a world recognized severe public health problem with considerable impact on the morbidity and mortality of the affected population[4]. The establishment of actions and public policies focused on individuals with the disease within the scope of the Brazilian Unified Health System (SUS) are required[5].

The sickle-cell disease began to gain political support in the Ministry of Health in 2001 through the Department of Health Care, which started designing a policy concerning care provided to patients with a diagnosis of sickle-cell disease and cared for by the SUS. A Ministerial Provision, GM No. 822/01, was initially established. It includes the exam that detects sickle-cell anemia and other hemoglobinopathies in the Newborn Screening Program[6] in 12 states of the Brazilian Federation. In 2004, the Coordination of the National Blood and Blood Products Policy was established. It was responsible for designing the Sickle-cell Disease and Other Hemoglobinopathies Healthcare policy within SUS as provided by decree GM 1,391/05[7].

The decree 1,391/05 establishes the National Policy of Integral Care to People with Sickle-Disease and Other Hemoglobinopathies aiming to organize healthcare delivered to people affected by the disease. Its guidelines include: ensuring follow-up of individuals diagnosed with hemoglobinopathies by the National Newborn Screening Program, receiving patients and including them in the SUS healthcare network primarily in the public blood network, providing care to people with late diagnosis of sickle-cell disease and other hemoglobinopathies with the creation of a national registry of individuals with sickle-cell and other hemoglobinopathies, ensuring integrality of care through healthcare provided by a multidisciplinary team, and establishing interfaces among the different technical fields in the Ministry of Health[7].

The purpose of the National Policy of Integral Care to People with Sickle-Cell Disease is to promote a change in thenatural history of the disease in Brazil, reducing the rate of morbidity and mortality, promoting the patients' longevity with quality of life and establishing continuous education for health professionals[1].

Statistical data presented by the National Newborn Screening Program of the Ministry of Health show that 3,500 children are born with sickle-cell disease in Brazil every year while 200,000 are born with sickle-cell traits. It is estimated that 7,200,000 individuals carry the sickle cell trait (HbAS) and 25,000 to 30,000 carry the sickle-cell disease[1]. For this reason, it is believed that the sickle-cell anemia, given its chronic and progressive nature, requires the implementation of programs designed to detect the diagnosis early, favoring preventive measures able to positively influence the treatment, control complications and the progression of the disease.

Leg ulcers, a secondary complication of sickle-cell anemia

Ulcers in the lower limbs are complications that frequently affect adults with sickle-cell anemia. Ulcers occur in 8% to 10% of homozygous patients though there are reports of incidence above 50% in patients living in tropical areas[8]. This variability occurs due to genetic differences and environmental conditions. Wounds appear in areas with less subcutaneous tissue and thin skin such as the inner or outer malleolar region, tibialis anterior and less frequently in the instep. They may be spontaneous or a consequence of small trauma. Their occurrence is frequent and the healing process is slow while response to treatment is worse than that observed in wounds of other etiologies[1-8].

Given the events that involve the healing physiological process of skin lesions, systemic factors

such advanced age, nutritional status, vascularization, systemic medication, primary disease, smoking and the site's factors including infections, topical agents, necrotic tissue, blood supply and protocol/appropriate type of coverage, may delay one or more phases of the healing process[9].

Therefore, nurses should take into account the perspective of patients when planning care, conveying accurate information and proposing changes in order to improve care so that the patient can actually become involved in the treatment favoring the healing process[10].

The State Institute of Hematology located in Rio de Janeiro is a referral center specialized in the care of patients with hereditary hemoglobinopathies. The Wound Dressing Room is a sector located in the institution's outpatient clinic that regularly cares for patients with sickle-cell anemia from low to high complexity while the most common skin complication are leg ulcers in their acute or chronic phase.

In 2008, 107 patients with ulcer were monitored in this wounds dressing sector due to skin complication secondary to the sickle-cell anemia. The duration of ulcers ranged from a period of two months to up 15 years. These wounds were classified as superficial or deep with different dimensions, with small to large extent, with varied ulcer beds, covered by granulation tissue, slough, and necrosis, according to the ulcer staging.

Patients in regular monitoring were recommended and had their dressings changed up to three times a week depending on the stage and progression of the healing process. The treatment was long due to the ulcers chronic nature without effective results that allowed the patients to be discharged.

The sector of wound dressing presented increased demand with operational indicators reaching 1,300 dressings/month showing an overload of the service and signalizing an alert for the review and change of procedures[11]. Given the problem presented, a new strategy was devised, a therapeutic modality mainly focused on health education, the Self-Care Program (PAC). The program emphasized self-care at home using polyhexanide-based dressings acquired by the Health Department to treat the wounds of patients cared for in state hospitals.

PAC is an institutional program implemented in November 2008, with weekly nursing consultations to monitor and assess the ulcer conditions. The patient is initially oriented about the disease and on how to care for the leg ulcer at home through self-care. Investment was made on health education to promote the healing process over the course of treatment.

Self-care education is based on Dorothea Orem's Self-Care Theory, the purpose of which is to enable the person to self-care. Nursing professionals have as a special concern the need to promote self-care actions, enabling one to be in control of care in a continuous basis to sustain life and health, recovering from diseases or injuries and reconciling with their effects[12].

Nursing theories expose the tendencies of views concerning the health-disease continuum and the experience of therapeutic care. It is a coordinated and communicative conceptualization of reality, even invented or created in nursing to describe, explain, prevent or prescribe nursing care[13].

Self-care practices aims health education, a strategy that leads the self-care individual to take preventive measures and early identifying clinical intercurrences. Such educational measures can encourage patients to minimize risk factors associated with the emergence of ulcers through strategies that orient the daily examination of skin, the use of repellents to avoid insect bites, keeping skin hydrated and protected, using cotton socks and avoiding scratching insect bites[14].

Given the previous discussion and the development of strategies established for this modality of care, the objective of this study was to provide nursing guidance concerning self-care as reference of treatment of leg ulcers secondary to sickle-cell anemia.

This study's objective was to verify the efficacy of the Self-Care Program through the progression of the healing process of leg ulcers secondary to sickle-cell anemia over the course of treatment.

The importance of a study of this nature is explained by the fact that leg ulcers affect between 8% and 10% of patients with sickle-cell anemia. They emerge during adolescence with a peak incidence around 20 years of age and, given its high frequency, chronicity, and resistance to the therapy available, there are high rates of recurrence[8]. Wounds may socially affect individuals and compromise their productive capacity. These lesions account for a significant portion of individuals seeking health services[1,8,14].

LITERATURE REVIEW

The sickle-cell disease is the most common hereditary disease in the world[15]. Sickle-cell anemia (SS) refers to the form of the disease that occur in homozygotes SS[1]. The disease originated in Africa and was brought to the Americas through the forced immigration of slaves.

In Brazil, it is heterogeneously distributed and is more frequently observed where the proportion of the African descendent population is larger (Northeast). The disease is predominant among Black individuals

and Mulattos but manifest in Caucasian individuals as well. The average prevalence of carriers in the Southeast is 2%, a percentage that reaches 6% to 10% among Black individuals. Estimates based on the prevalence, indicate that there are more than 2 million carriers of the HbS gene and more than 8,000 are affected with the homozygous form (Has). For this reason, the sickle-cell disease is appointed as a public health problem in Brazil[1].

Given its prevalence, the sickle-cell disease was included in the actions of the National Policy of Integral Care of the Black Population of the Ministry of Health and in the regulation of the SUS, through the guidelines of the Decree 1,391/05 - National Policy of Integral Care to People with Sickle-Disease and Other Hemoglobinopathies[7].

Another advancement in the control of the sickle-cell disease refers to the early diagnosis in the first week of newborns, which is performed by the referral services of the National Newborn Screening Program of the Ministry of Health. It is an essential exam to identify, qualify and monitor cases of the disease[15].

People affected by sickle-cell anemia may present, in addition to manifestations of chronic anemia, important symptomologyand severe complications. The condition is dominated by pain episodes, infections and pulmonary infarcts, delayed growth and sexual maturation, stroke, and chronic compromise of multiple organs, leg ulcers, among others[5].

Leg ulcers are one of the most frequent manifestations of sickle-cell anemia and significantly compromise patients' quality of life, capacity to work due to its chronic nature and resistance to the therapy available, with high rates of recurrence. The etiology may be trauma, contusions, insect bites, or spontaneous due to tissue hypoxia caused by chronic vessel occlusive crises[15].

The incidence of leg ulcers largely varies among different studies, between 25% and 75%[8]. Another interesting aspect is the variation of the incident in different age groups; this complication emerge only after the second decade of life[1].

Clinically, there is a large variability in the size of ulcers, which may be extremely painful. Some are deep and involve subcutaneous tissue. There is often secondary bacterial infection, which may contribute to the worsening and persistence of ulcers[15].

Absence of healing occurs in up to 60% of cases, frequently with prolonged progression that may last months and even years, usually associated with larger wounds. Recurrence generally occurs from six to eight months after initial healing[16].

The treatment of leg ulcers includes daily cleaning, the use of bandages, surgical treatment, rest and elevation of the affected limb[8].

Educational measures adopted to avoid the emergency of leg ulcers due to sickle-cell anemia include: prevention of trauma through the use of cotton socks and shoes; the use of repellents to avoid insect bites; the topical use of moisturizing to avoid exfoliation and skin scarification; and prompt treatment of small traumas. These are useful measures to be emphasized to patients in every consultation, especially for those with a prior history of ulcers[8-14].

Leg ulcers considerably compromise the quality of life of people with sickle-cell disease leading to emotional, social and professional problems. The involvement of patients with self-care practices is essential to achieve success in the treatment[15].

This study was based on Dorothea Orem's Self-Care Theory, the purpose of which is to enable individuals to practice self-care. Nursing professionals have as a special concern the need to promote self-care actions, enabling one to be in control of care in a continuous basis to sustain life and health, recovering from diseases or injuries and reconciling with their effects[12].

Embedded in the concept presented, self-care emerges as personal care that is daily required by individuals to regulate one's own functioning and development. Orem's Self-care theory also considers that the individual's ability to become engaged with self-care is conditioned by age, stage of development, life experience, socio-cultural orientation, health and resources available[12].

METHOD

This longitudinal study with a quantitative approach was conducted with 40 patients selected according to previously established inclusion criteria and monitored for a period of two years in nursing consultations and during the changing of dressings in a public health facility specialized in hematological care located in the metropolitan region of Rio de Janeiro, Brazil.

The study's participants were selected among patients regularly monitored in the sector of wound dressings. Those who met the following inclusion criteria were eligible to participate: being registered in the institution; having a diagnosis of sickle-cell anemia; being in regular treatment in the sector; and having an acute or chronic leg ulcer of low to medium complexity of up to 50cm^2, presenting granulated or semi granulated bed with duration of up to ten years. Those younger than 18 years old; allergic to polyhexanide solutions; or undergoing hypertransfusion therapy were excluded.

It is worthy noting that all the study's subjects were properly informed by the researchers of the study's objective and procedures to be adopted, signed free and informed consent forms, and authorized digital photographic recording to be included in the study.

The proposal of this study was to guide the subjects selected at the time of nursing consultations informing about the disease, the required self-care actions and therapy indicated for leg ulcers secondary to sickle-cell anemia.

To provide the orientation to the selected patients, an explanatory folder was given during nursing consultations and training was implemented to explain the wound dressing procedure with the topic application of polyhexanide-based solutions. This product functions as a biological barrier against pathogenic agents, inhibiting bacterial growth in the areas where it is applied, and by creating an environment conducive to the proliferation of the normal flora. It is used as a primer coat to treat chronic wounds since it does not interferes with tissue re-epithelialization[17].

After orientation, as a methodological strategy to collect data, an instrument previously developed, called report of nursing consultation, was used. The profile of patients (identity and socio-demographic data), etiology, location, duration of ulcer, its dimensions and flatness, appearance of the wound's bed and perilesional appearance, quantity of exudate, degree of pain and the topical treatment indicated, were collectedin addition to monitoring of the healing process through digital photographic recording.

At the end of the consultation, the patient was sent to the wound dressing room to have his/her wound assessed and dressing changed. The procedure was initiated with the removal of the secondary and primary bandages, the wound was visually examined, cleaned with saline solution at 0.9%, and then measured followed by digital photographic recording. The wound was then irrigated with antiseptic solution and polyhexanide hydrogel and covered with secondary dressing (gauze and bandage). It is worthy mentioning that dressings, actions and proper orientation concerning the procedure were shared with all the study's participants.

This study was based on a previous research addressing the use of polyhexanide-based solutions in leg ulcers secondary to sickle-cell anemia, which was previously submitted to and approved by the Institutional Review Board in relation to its legal ethical aspects contained in Resolution 196/96, Ministry of Health (protocol 147/08).

Data analysis was conducted using Cox models, logistic regression, and classifications trees of the results obtained through the nursing consultation report and digital photographic recording. The initial exploratory analysis used Box-plot to identify whether there was a significant difference between the ulcer's initial and final dimensions. The Cox model was implemented considering the partial healing of ulcers to be a failure. Three Cox models were implemented differing among them by the choice of independent variables. The logistic regression model was used for data analysis considering total healing as the outcome and the tree classification was implemented after the logistic model.

RESULTS

Of the 40 patients included in the study, 35 (87.5%) were males and five (12.5%) were females with average age of 32 years old. In regard to the level of education: 25 (62.5%) had completed middle school; six (15%) had high school; and nine (22.5%) were illiterate, with average family income of one time the minimum wage. In regard to housing, 12 patients (30%) lived in the central region close to the facility and 28 (70%) lived in peripheral areas. These data contributed to the study's development because information enables an understanding concerning the profile of patients and socio-demographic conditions are important indicators for the implementation of programs of this nature.

With regard to the manifestations of the disease, 22 had acute ulcers with duration between two and six months, 18 patients had chronic ulcers with duration between seven months and six years. Acute ulcers are defined as wounds with duration of up to six months, classified as short-term wounds of sudden onset[9].

In the first year of the study, ten patients (eight of which had acute ulcers with an average duration of two months, dimensions between 4 and 20 cm^2, and two had chronic ulcers with an average duration of four years and dimension between 10 and 32 cm^2 achieved complete healing by daily changing the dressings at home with polyhexanide-based solutions and following guidance provided by nurses.

After two years since the program's implementation, 23 patients were discharged after total healing of ulcers: 16 had acute ulcers and seven had chronic ulcers. The remaining 17 (42.5%) patients experienced partial healing of ulcers with a reduction of 47% in the dimensions of ulcers and remained in regular monitoring by the self-care program.

The Box-plot (Figure 1) shows a significant difference between the initial and final sizes of ulcers ($p<0.0001$).

Figure 1. Ulcer's size.

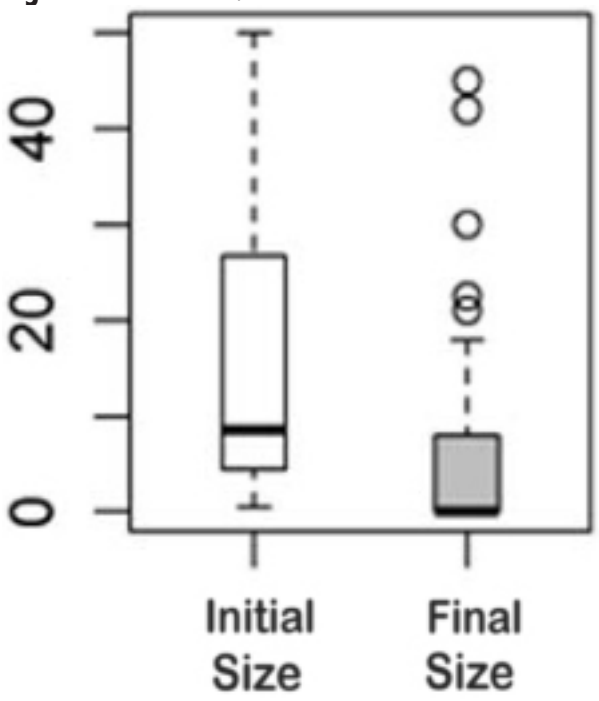


Figure 2 presents the estimate of time to healing through Kaplan-Meier curve. Average healing time was 151 days.

Modeling of data was performed with the implementation of the Cox model, logistic regression model and classification tree.

The Cox model was initially implemented considering healing as the event of interest and partial healing as censored. This model's independent variables were: difference between the ulcer's initial and final sizes, age, number of ulcers, gender, and time of ulcer's duration (months). Cox model identified the ulcer's time of manifestation as the only significant variable (p=0.01).

In the following stage, a logistic regression model was implemented using the same independent variables used in the Cox's model. Total or partial recovery was the independent variable. Again, wound's duration was significant in the logistic regression (p=0.01), confirming the Cox model result. The classification tree (Figure 3), implemented with the same co-variables showed that the most critical cases were those in which the patients presented more than one ulcer. The tree also showed that patients with a single ulcer with a duration of up to 60 months have a 95% chance of healing while those with a single ulcer but a duration of more than 60 months have a 95% chance of healing.

Figure 2. Time until healing is achieved.

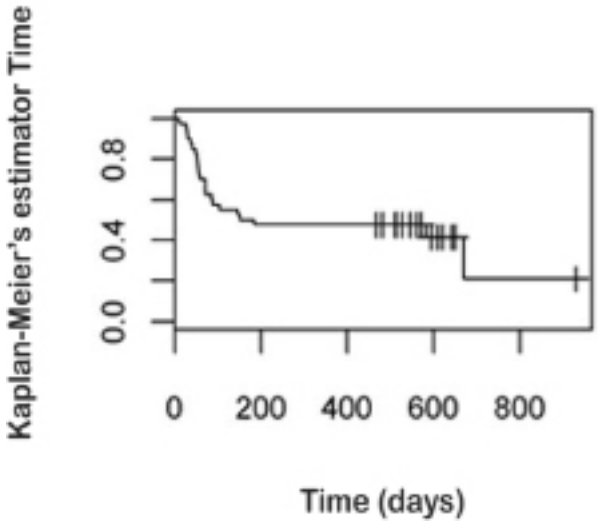
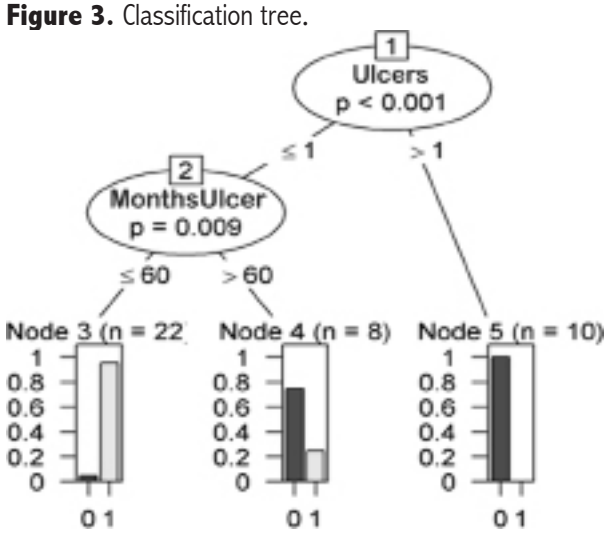


Figure 3. Classification tree.



Patients who experienced a reduction of 88% in the ulcer's size presented better response to the treatment and achieved total healing. This group was composed of 23 individuals, that is, 57.5% of the individuals participating in this study.

These results corroborate with the implementation of the self-care program with the indication and standardization of atopical treatment of leg ulcers secondary to sickle-cell anemia using polyhexamida-based solutions. The use of these solutions was efficacious in the healing process of these wounds during the course of treatment. Due to its broad spectrum of microbial action, the polyhexanide reduces risk of contamination, conferring less toxicity. The structural similarity of polyhexanide to the arginine amino acid promotes a relaxant effect on the blood vessels accelerating the healing process and giving vitality to the vascular endothelium due to the induction of angiogenesis[18].

Adherence of patients to the treatment and the achieved results caused the program a considerable impact as therapeutic modality, which was then incorporated as institutional program.

DISCUSSION

Studies addressing chronic ulcers in patients with a diagnosis of sickle-cell anemia report these wounds are associated with significant clinical and psychosocial morbidity and increased risk of early death. Risk factors for chronic ulcers among individuals with sickle-cell anemia include: being a male, vessel occlusion, lower levels of fetal hemoglobin (HbF), the presence of polymorphic genes, inhibition of nitric oxide, venous insufficiency and socio-economic conditions[8].

Ulcers in the lower limbs are frequent complications among adults with sickle-cell anemia. They occur in 8% to 10% of the patients with sickle-cell anemia though there are reports of incidence above 50% among patients living in tropical areas. This variability occurs due to genetic differences and environmental conditions[8]. Ulcers are more common among male patients and emerge during adolescence with a peak incidence around 20 years of age, data that corroborate the results presented in this study[16].

The complete healing of 23 patients and partial healing with a reduction of 47% of wounds in the remaining patients monitored in the self-care program was achieved in this study. These satisfactory results oppose data reported in the literature emphasizing that "healing of sickle-cell ulcer is slow and presents a worse response to treatment compared to ulcer of other ethiologies"[3,5,14]. These findings clarify that the therapeutic approach used for leg ulcers of patients with sickle-cell anemia is similar to that used in patients with ulcers of other ethiologies[1,8]. Nurses should understand the perspective of patients when planning care so that patients are enabled to become engaged in the treatment favoring the healing process. It is important to examine the wound, indicate and change dressings, providing guidance concerning the prevention of complications, keep photographic documentation, and recommend complementary exams to help the diagnosis and the healing process[10]. These stages were implemented in this study.

We verified that the patients affected by sickle-cell anemia with leg ulcers presented improvement in their healing processes over the course of treatment, considering that six patients experienced periods of stagnation in the ulcers condition associated with local pain, irregular change of dressing at home, irregular attendance to the nursing consultations, altered general clinical condition (pulmonary infections and pain crises).

Pain is the result of microcirculation obstruction caused by the sickling of the red blood cells. This is the disease's most dramatic manifestation because pain crises occur suddenly and often without prodromes,

directly impacting the patients' quality of life. The pain crises sometimes occur after an infectious episode suggesting that fever, dehydration and acidosis may trigger vessel occlusion. Pain may also occur after sudden cooling of the skin or exposure to physical or emotional stress[16].

Prior to the study, the patients in regular follow-up had the dressing changed up to three times a week depending on the ulcer's staging, spending long hours commuting due to the distance from their homes to the unit. It is known that lack of rest and exhaustive routines interfere in the ulcers' healing process causing pain, increasing exudation and in some cases, increasing the size of wounds. The treatment indicated to all the patients is daily cleaning of ulcer, rest and elevation of the affected limb[14]. These data corroborate this study, which enabled to reduce the frequency patients attended the facility, and to perform self-care actions daily at home such as the regular change of dressings.

The purpose of grounding the self-care program on Orem's theory was to provide tools to nurses so they can enable patients, through nursing consultations, to manage actions aimed to promote and maintain health, the treatment and prevention of diseases. The nursing consultations served as opportunities to exchange experiences and provide help, encouraging patients to adhere to the self-care actions according to the nurses' orientation. The support-education system encouraged health promotion and a perception concerning the importance of patients to participate in care, concluding that Orem's theory enables care and therapeutic communication appropriate to the patient's situation[13].

The care provided to this population should meet physical needs, provide psychological support, and include strategies that enable self-knowledge, self-control and the active participation of these individuals in self-care[13]. Therefore, when patients learn guidance and follow it, there is maintenance of human functioning and structural integrity, situations that contribute to the development and recovery of health[12].

We note that the hereditary, non-infectious, chronic and incurable nature of sickle-cell anemia is an aspect poorly understood by the affected population. For this reason, an early diagnosis and the inclusion of integral care programs are fundamental to reduce the disease's morbidity and mortality[1,7]. Therefore, we consider that health education concerning the disease favor she exercise of citizenship through the active participation of patients in the establishment of care, acknowledged as a priority to transform the natural history of the disease in a process of longevity even in the face of social or economic osbtacles[1].

The implementation of health education programs (PAC) in agreement with health public policies is aimed to involve nurses and teams under nurses' coordination in healthcare delivered to patients and their families, generating knowledge, research and transforming actions to contribute to a equitable Unified Health System[5].

CONCLUSIONS

This study shows the efficacy of the Self-Care Program through the progression of the healing process over the course of treatment based on the complete healing of 23 patients' ulcers. The study also confirmed that acute ulcers with a duration of up to 60 months have a 95% change of cure.

The nurse's work was crucial in the development of this study based on Orem's Self-Care Theory, which aimed the application of this theory as an instrument to provide care - implemented on nursing consultations that enabled the nurse to provide guidance on actions that met these patients' needs, helped the performance of self-care, promoted health education, improved quality of life and encouraged treatment adherence.

Given the patients' adherence and the results achieved, the self-care program was established as a therapeutic modality and was incorporated as an institutional program, essential reference in the treatment of sickle-cell ulcers.

The program contributed to the effective participation of patients and was successful in increasing the frequency of patient discharge due to the complete healing of ulcers after different periods of manifestation. It encouraged self-knowledge and care delivery at the level of primary health care as recommended by SUS, which includes primary health care such as early diagnosis and routine follow-up, in addition to preventive care such as health education, witch is the program's philosophy.

Hence, we believe that health promotion programs require effort and co-responsibility to promote changes simultaneously in the individual and collective dimensions, with the participation of nurses at all levels of health care.

Even though the objective was achieved, more studies of this nature, focused on prevention, control of the advancement and complicationsof leg ulcers secondary to sickle cell are needed.

We believe that in order to produce changes in practices, and especially, to modify practices institutionalized in health services, nurses should base their educational actions on technical and scientific knowledge, focusing on individual and collective needs, and favoring a systematic reflection shared with the patients according to public health policies.

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