Original Article

Nursing Care and Psychosocial Impacts of Chronic Leg Ulcers in Patients with Sickle Cell Disease: A Pilot Study

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ABSTRACT

Leg ulcers are the most common long-term complication of sickle cell disease in Nigeria and pose a significant psychosocial burden. This study assessed the psychosocial impact of chronic leg ulcers in affected patients and explored potential interventions to improve quality of life and promote wound healing. Using the biopsychosocial model, eighteen adult patients with chronic leg ulcers were conveniently selected from two health facilities in Ibadan and treated with four-layer compression bandaging. Psychosocial outcomes before and after the intervention were assessed using a semi-structured quality-of-life questionnaire. Paired-samples t-tests evaluated changes in psychosocial symptoms, and linear regression identified predictors of quality-of-life scores. Participants aged 19–44 years, had ulcer durations ranging from 1 to 22 years. Common symptoms included pain, insomnia, malodour, social isolation, and depressive features several of which improved significantly following intervention ($p = 0.005$). Pain severity significantly predicted quality-of-life scores [adjusted $R^2 = 0.613$, $p = 0.0001$; $y = 20.9 + 5.2(x)$]. Effective pain and odour management, along with a community-based nursing approach, can substantially improve patient outcomes and overall quality of life.

Keywords: Chronic leg ulcer, Compression therapy, Nursing care, Pain management, Psychosocial impact, Quality of life, Sickle cell disease.

INTRODUCTION

Sickle cell disease (SCD) is a global health challenge associated with numerous complications, among which chronic leg ulcers are particularly debilitating. These ulcers contribute significantly to physical disability and psychosocial distress. Sickle cell-associated leg ulcers (SCLUs) are a common yet underexplored manifestation of SCD, presenting as persistent, painful wounds that negatively affect patients' social and psychological well-being. Individuals with SCD are predisposed to chronic leg ulcers due to underlying pathophysiological mechanisms such as vaso-occlusion, endothelial dysfunction, chronic anaemia, and venous incompetence. Vaso-occlusion in the lower limb vasculature results in tissue ischaemia, leading to skin breakdown and delayed wound healing, which contributes to the chronic nature of these ulcers.[1,2]

The incidence of chronic leg ulcers in individuals with SCD is significantly higher than in the general population and tends to occur at a younger age.[3] In contrast, leg ulcers in the general population are more prevalent among older individuals with

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conditions such as chronic venous insufficiency.[4] The prevalence of SCLUs varies widely: as high as 75% in Jamaica,[5] rare in Saudi Arabia,[6] and ranging from 3.1% to 9.6% across different regions of Nigeria.[7]

Compression bandaging is regarded as the gold standard for managing chronic leg ulcers.[8,9] However, in Nigeria, alternate-day wound dressing is more commonly employed, while other advanced treatment modalities—such as compression therapy and skin grafting—remain cost-prohibitive for many patients. Beyond the physical manifestations, SCLUs are associated with substantial psychosocial burdens, including stigma, depression, social isolation, and reduced quality of life (QoL).[10,11] Despite these challenges, most research has focused primarily on the clinical and microbiological aspects of SCLUs, with limited attention to their psychosocial implications. Addressing these dimensions is essential to delivering comprehensive care.

The complexity of SCLUs necessitates a multimodal and holistic nursing approach—one that integrates not only physical treatment but also emotional and social support. Patient-centered strategies that consider individual preferences and lived experiences foster a therapeutic alliance between patients and healthcare providers. For example, addressing the emotional toll of having visible ulcers may prompt discussions about social anxiety, body image, and the need for supportive communication to combat isolation. Such targeted interventions can enhance emotional resilience and contribute positively to healing.[12]

Holistic care that encompasses physical, psychological, and social domains is crucial in managing chronic leg ulcers in individuals with SCD. Integrating therapeutic nursing interventions with psychosocial support fosters an environment conducive to healing and improved quality of life. Evidence shows that holistic practices—including comprehensive nursing care and relaxation techniques—can significantly reduce pain and anxiety, increase patient satisfaction, and support faster wound healing.[13]

This study was conducted to investigate the psychosocial impact of living with SCLUs and to assess the effects of treatment interventions among adult patients attending haematology clinics in Ibadan, Southwest Nigeria. The study adopts the biopsychosocial model, which emphasizes the dynamic interaction between biological, psychological, and social factors in health and disease.[14] Unlike the traditional biomedical model, the biopsychosocial framework recognizes that health outcomes are shaped by a complex interplay of physical symptoms, emotional responses, and social environments. This model not only enhances our understanding of the multifaceted nature of SCD-related ulcers but also informs more effective, patient-centered care strategies aimed at improving outcomes and quality of life.

MATERIALS AND METHODS

Sampling Technique: A convenience sampling method was employed, selecting 18 adults from the haematology clinics at University College Hospital and Ring Road State Hospital, Ibadan. The study population consisted of individuals with sickle cell anaemia who met the inclusion criteria and consented to voluntary participation.

Study Instrument: The primary research tool was a 32-item QoL questionnaire, which explored perceptions, emotional impact, lifestyle changes, and socioeconomic effects of chronic leg ulcers. This instrument included binary and Likert-scale response options to assess varying levels of psychosocial burden and quality of life changes over time.

Method of Data Collection: This study utilized a self-administered semi-structured quality of life (QoL) questionnaire, completed by participants before and after a three-month compression bandaging intervention. The questionnaire assessed various psychosocial dimensions, including emotional responses, lifestyle adjustments, employment, and healthcare experiences.

Data Collection Procedure: Participants were conveniently selected from haematology clinics at two hospitals in Ibadan. The study employed a pre- and post-intervention design, where data were gathered at two time points: before the initiation of compression bandaging and three months after. The

QoL questionnaire underwent face-to-face content validation and test-retest reliability assessment.

Treatment Intervention: Compression bandaging has been proven to have improved rate of healing in the treatment of chronic leg ulcers.[15,16] A four-layer compression bandaging was done at the Ring Road State Hospital, Ibadan, once a week, as opposed to the alternate day dressing method which was previously used on most of the patients. The four-layer compression bandaging produces an effective and sustained pressure that lasts for one week before changing the wound dressing. This method of treatment is quite expensive and costs about $20 per leg as at the time of the study. Based on prior assessment of wounds by the attending plastic surgeon and responses from the pre-intervention self-reported questionnaire, oral antibiotics were prescribed to the patients and topical antiseptics (10% povidone iodine or silver-based dressing) was also applied during wound dressing, which was done once a week.[16]

Inclusion Criteria: People living with sickle cell anaemia (SCA) having chronic leg ulcer, 18 years and above, attending the haematology clinics at the University College Hospital and Ring Road State Hospital, Ibadan consenting to voluntary participation.

Outcome measures: This study assessed both primary and secondary outcome measures to evaluate the psychosocial impact of chronic leg ulcers in sickle cell disease patients and improvements with wound healing based on treatment intervention.

Primary outcome measures focused on key psychosocial effects of chronic leg ulcers such as pain levels, malodour, insomnia, and other depressive symptoms before and after treatment intervention.

Secondary outcome measures focused on wound size reduction and ulcer healing rate with associated impact on social activities, work and income.

Data analysis: Descriptive analysis was done for sociodemographic characteristic and history of leg ulcer. Response options for binary responses were scored as 0 for 'no' and 1 for 'yes'. Other responses ranged from 0 - 4 (0= Not at all, 1 = Mild/A little, 2 = Moderately/Sometimes, 3 = Quite a lot/severe, 4 = very much/very severe). Responses for each participant at the beginning of the study were scored and compared with responses at the end of the study using a paired samples t-test. Unpaired two-samples t-test was used to compare scores between those with one leg ulcer and those with two. Linear regression analysis was done to determine the impact of certain variables such as wound size, duration of ulcer and pain on participants' total scores. The wound size and duration of leg ulcer data were log transformed to normalize the data. Stata 18 was the statistical software used. The level of statistical significance was set at $p < 0.05$. For questionnaire analysis, a small number of unanswered items were assumed to indicate the lowest response category ('Not at all'), based on the assumption that participants who did not select a response likely did not experience the symptom or issue in question. This approach was taken to minimize missing data bias while maintaining the integrity of the dataset. Manual handling of the thematic areas was done due to small sample size.

Ethical considerations: Ethical approval was obtained from the University College Hospital Ethical Review Board with approval number UI/EC/15/0133. Informed consents were taken from each of the participants and a code number was assigned to each patient to protect participants' privacy. The design and implementation of the research protocol were in accordance with the principles of The Declaration of Helsinki.

RESULTS

Socio-demographic characteristics

Participants were 6 adult males and 12 females aged between 19 and 44 years, 11 (61.1%) and 7 (38.9%) had secondary and tertiary education, respectively (Table 1). Family history of siblings having SCD was present among 6 (33.3%) and 5 (27.8%) of them had siblings with history of leg ulcers. Those with previous leg ulcers, which took 1 month - 5years to heal up were 16 (88.9%). Ulcers were located around the ankles in more than 70% (13) of the patients. Eleven (61.1%) patients had ulcer on only one leg while the remaining seven (38.9%) had ulcer on both legs (Table 1). Most patients developed ulcers in the adolescent period and age at presentation peaked at 21 – 35 years. Most of them were experiencing a recurrence of a previously healed leg ulcer. The duration of the ulcers varied from 6 months to 22 years. Wound sizes ranged from 0.5 cm^2 – 416.0 $cm^{2/}$. All patients complied with the three months treatment and post-questionnaires were administered to them and analyzed.

Impact of leg ulcer on physical domain

As shown in Table 2, at the beginning of the study, all the patients except one, reported that they felt pain from the leg ulcer. As reported by the patients, the degree of pain was moderate in 4 (22.2%) participants and more severe in 7 (38.9%) participants. The pain affected the sleep of majority (72.2%) of the patients and affected the way most of the patients walked. Some of the patients had varying degrees of deformations in posture while walking. Most of the patients took oral analgesics such as paracetamol (acetaminophen), diclofenac, ibuprofen, tramadol and felvin (piroxicam) while the others took parenteral drugs to relieve the pain. A disturbing discharge from the wound was reported in two-thirds of the patients, and most of this discharge were yellow and green in colour. Itching was associated with the ulcer in 16 (88.9%) patients. Malodour (bad smell) from the ulcer was reported in 8 (44.4%) of the patients (Table 2). To alleviate itching, most of them scratched the wound, beat the part that was itching or did nothing. One of them went as far as placing hot object around the edges of the wound. Excerpts:

LU 014 – "*I scratch, place hot objects around the edges*"

LU 02 – "*beat the part*"

The ulcer also significantly affected personal grooming of 4 (22.2%) of the patients and about half of them experienced varying levels of difficulty in climbing the stairs. Two-thirds of the patients were affected at least moderately from carrying out their household chores (Table 2)

Impact of leg ulcer on occupational and social domain

Most of the patients (83.3%) were restricted from leisure and social activities and about half of the patients felt lonely because of the ulcer (Table 2). Two of them (11.1%) admitted that the ulcer has affected their education. Below are a few excerpts:

LU 09 – *"It restricts me from going out to occasions, church, dates, outings with friends because I will want to rest on weekends to prepare for Mondays and weekly stress"*

LU 011 – "*It prevents from travelling and to go to school*"

Majority of the patients reported that ulcer had affected their work and income. Three major ways by which the leg ulcer has affected the patients' work/income are loss of capital due to treatment, absenteeism at work due to pain and reluctance to go to work because of malodour. Below are a few excerpts:

LU 01 -"*It gives pain while I am attending to customers and have spent all my business capital on the leg"*

LU 09 - "*My job entails me standing all the time and walking around, but it is painful, and it hurts so much, which makes me to stay at home sometimes, and then my boss complains of my absence*"

LU 016 – "*I don't want to go to work because of the odour*"

Majority (83.3%) of the patients reported that the ulcer has been a financial burden and they have had to depend on others for help (Table 2)

Reported depressive symptoms due to chronic leg ulcer

Since onset of ulcer, 11 (61.1%) of the patients reported reacting harshly to people. About two-thirds of the patients had a change in their mode of dressing to conceal the wound and most of them did not like this. All of them had their self-esteem affected since the onset of the ulcer. Except for one patient, all of them had worried about the wound and about half of them think about the wound for more than 5 hours a day. The non-healing of the ulcer had frustrated most of the patients and sadness for most part of the day was reported in 83.3% of them. All the patients except one reported being depressed and two of them were pessimistic that their wound would not heal up. In most of the patients, some level of discomfort due to wound dressing was reported and this was quite severe in 3 (16.7%) of them (Table 2).

Pain and quality of life in patients with chronic leg ulcer.

The impact of variables such as wound size, duration of ulcer, level of pain, effect of ulcer on work and income on the quality of life of the patients was assessed using linear regression analysis. Only the level of pain significantly impacted the quality-of-life scores [adjusted R^2=0.6131, p=0.0001, y= 20.9 + 5.2 (x)] (Table 3). The mean scores between those with two legs and one leg affected were also analyzed using two-sample t-test (equal variances). This also was not statistically significant (t=0.5014, p=0.6229).

Improvement in psychosocial symptoms post intervention

Questionnaires were also administered to the patients after the three months of treatment intervention. There had been marked reduction in wound sizes and in a few cases (4 out of 18), there was complete healing. Twelve (66.7%) patients still felt pain after 3 months of treatment as opposed to 17 (94.4%) at the beginning of the treatment. The number of people experiencing severe pain also reduced from 7 (38.9%) at the beginning of the study to 3 (16.7%) after the treatment. Pain affected the sleep of 13 (72.2%) of the patients at the beginning of the study, while at the end of 3 months treatment, only 9 (50%) of the patients were still affected. There was a reduction in the number of patients (12, 66.7%) who reported discharge from the wound at the beginning of the treatment compared with 9 (50%) who reported discharge from the wound at the end of the treatment. There was significant reduction in the mean scores of responses in this physical domain section post-intervention (paired samples t test= -2.963; p=0.005) (Table 4). There was no marked difference in the scores for the social, financial, and psychological domains. However all of them were optimistic about the healing of their wounds.

Table 1: Socio-demographic characteristics of the study participants

Characteristics		No. of Participants (%)
Age	19 - 30 yrs	12 (66.7)
	>30 yrs	6 (33.3)
Gender	Female	12 (66.7)
	Male	6 (33.3)
Level of	Secondary	11 (61.1)
education	Tertiary	7 (38.9)
Number of	1	11 (61.1)
affected legs	2	7 (38.9)
Wound size	<10cm^2	4 (16)
	10cm^2 to 100cm^2	15 (60)
	>100cm^2	6 (24)
History of a	Yes	12 (66.7)
previous leg ulcer	No	6 (33.3)

Table 2: Self-reported questionnaire responses by the study participants before intervention

	N = 18	**Not at all n (%)**	**A little n (%)**	**Moderately n (%)**	**Quite a lot n (%)**	**Very much n (%)**
	Impact of leg ulcer on physical domain					
1	I feel pain from the wound on my leg	1 (5.6)	6 (33.3)	4 (22.2)	6 (33.3)	1 (5.6)
2	The pain affects my sleep	5 (27.7)	3 (16.7)	5 (27.7)	2 (11.1)	3 (16.7)
3	The pain affects the way I walk	3 (16.7)	1 (5.6)	8 (44.4)	4 (22.2)	2 (11.1)
4	What do you do to alleviate pain?	Oral medications (14) (77.8)	Injection (2) (11.1)	Nothing -	Others, specify -	
	Name of medication routinely used to relieve pain (open-ended)					
5	There is a disturbing discharge from my wound	6 (33.3)	4 (22.2)	4 (22.2)	2 (11.1)	2 (11.1)
	Colour of discharge	Yellow (33.3)	Cream (1) (5.6)	White (5.6)	Yellow and green (22.2)	
6	The wound itches me	2 (11.1)	1 (5.6)	10	3 (16.7)	2 (11.1)
7	What do you do to alleviate itching? (open -ended response)					
8	My wound has a bad smell	10 (55.6)		3 (16.7)	3 (16.7)	2 (11.1)
9	The wound affects my personal grooming	11 (61.1)	3 (16.7)	2 (11.1)	1 (5.6)	1 (5.6)
10	Climbing stairs has been difficult because of the wound	9 (50)	3 (16.7)	-	2 (11.1)	4 (22.2)
11	The wound affects my housework	4 (22.2)	2 (11.1)	4 (22.2)	2 (11.1)	6 (33.3)
	Impact of leg ulcer on social, occupational, and financial domain					
1	I feel isolated/lonely because of my wound	8 (44.4)	4 (22.2)	3 (16.7)	3 (16.7)	-
2	The wound has limited my leisure activities	3 (16.7)	5 (27.7)	5 (27.7)	2 (11.1)	3 (16.7)
3	The wound has forced me to limit my social activities with others	3 (16.7)	3 (16.7)	3 (16.7)	1 (5.6)	8 (44.4)
4	Provide at least one example of how you have been limited (open-ended response)					
5	The wound affects my work	2 (11.1)	5 (27.7)	4 (22.2)	6 (33.3)	1 (5.6)
6	The wound affects my income	3 (16.7)	-	5 (27.7)	5 (27.7)	4 (22.2)
7	Briefly explain how the wound affects your work/income? (open-ended response)					
8	The wound has been a financial burden to me	3 (16.7)	4 (22.2)	2 (11.1)	2 (11.1)	7 (38.9)
9	I have felt dependent on help from others because of the wound	3 (16.7)	2 (11.1)	1 (5.6)	3 (16.7)	9 (50)
Impact of leg ulcer on psychological domain						
1	I react harshly to people since the onset of the ulcer	7 (38.9)	5 (27.7)	4 (22.2)	2 (11.1)	-
2	I have changed my mode of dressing since the onset of the ulcer	No 6 (33.3)	Yes 12 (66.7)			
3	I like the way I dress recently	Yes 6 (33.3)	No 8 (44.4)			
4	My self-esteem has been affected since the onset of the wound	-	3 (16.7)	5 (27.7)	5 (27.7)	5 (27.7)
5	I have worried about my wound	1 (5.6)	3 (16.7)	-	2 (11.1)	12 (66.7)

Table 3: Linear Regression of Quaity of life scores on pain

Predictor	Coefficient	Std. Error	t	p-value	95% confidence interval
Pain score	5.2	0.975	5.28	0.0001	3.134 to 7.266
Constant	20.9	3.099	6.81	0.0000	14.329 to 27.471

Model summary

Number of observations (N)	18
F-statistic (df = 1, 16)	27.92
Model p-value	0.0001
R-squared	0.6359
Adjusted R-square	0.6131
Root Mean Squared Error (RMSE)	4.359

Table 4: Paired samples t test comparing scores in the physical domain pre and post intervention

Statistic	Quality of life scores for the physical domain		Value
	Pre-intervention	Post-intervention	
Mean	5.64	3.57	
Variance	5.63	7.03	
Observations	18	18	
Pearson Correlation			0.463
Hypothesized mean difference			0
Degrees of freedom (df)			17
t-statistic			-2.96
P-value (one -tailed)			0.005
t Critical (one -tailed)			1.771
P-Value (two -tailed)			0.011
t Critical (two -tailed)			2.160

DISCUSSION

This study was conducted to investigate the psychosocial impact of chronic leg ulcers in patients with sickle cell disease (SCD) and to assess the effectiveness of selected treatment interventions. At baseline, participants reported varying degrees of pain, discomfort, and depressive symptoms, along with functional impairments such as difficulty walking, insomnia, social withdrawal, and reduced self-esteem. Some of these symptoms improved with ulcer healing. However, significant improvements in psychological, financial, and social domains often require longer periods post-healing. The fear of ulcer recurrence may have also contributed to the limited psychological recovery observed.

SCD imposes a substantial psychosocial burden on affected individuals, and the presence of chronic leg ulcers further compounds this challenge, thereby worsening overall quality of life. It is essential, therefore, to address both the physical and psychosocial aspects of care concurrently. This study proposes practical interventions in three key areas to enhance quality of life and treatment outcomes for patients with SCLUs.

Pain Management

Pain was the most frequently reported symptom, with many participants experiencing moderate to severe pain. Pain was present not only due to the ulcer itself but also during wound dressing, especially with compression bandaging. The severity of pain significantly impacted patients' quality of life and physical function. Many participants adopted unnatural postures to alleviate pain during mobility or daily activities, resulting in physical deformities and further discomfort. Previous studies have reported similar findings, including walking disabilities and sleep disturbances that contribute to frustration and depressive symptoms.[17, 18]

Inadequate pain management has both physiological and psychological consequences, negatively affecting healing and patient satisfaction. In contrast, effective pain control improves clinical outcomes, enhances patient engagement, and accelerates healing.[19] Pain management should therefore be a core component of SCLU care.

Both pharmacologic and non-pharmacologic strategies should be employed.[19,20] For example, administering analgesics 30–60 minutes before dressing changes or using topical anaesthetics may reduce procedural pain and increase compliance. Pain diaries and regular assessments should be integrated into nursing care to monitor symptom progression and adjust treatment accordingly. Notably, evidence suggests that well-managed pain may also facilitate faster wound healing.[21]

Malodour control

Approximately half of the participants reported malodour from their ulcers, often associated with purulent discharge and microbial infection. Malodour significantly affected patients' social interactions, self-esteem, and emotional well-being, often resulting in social isolation. The offensive smell is commonly caused by tissue degradation mediated by anaerobic and Gram-negative bacteria.[22,23] Topical antibiotics such as metronidazole affordable and widely available—have proven effective in reducing malodour due to their anaerobic coverage.[24] Super-absorbent dressings may help control exudates, while appropriate systemic antimicrobial therapy may also reduce pain by addressing microbial inflammation.[25]

A community-based approach to care

Some participants, especially women, expressed concern about modifying their clothing to conceal the ulcer, leading to self-consciousness and emotional distress. In addition, the financial burden of treatment especially for four-layer compression bandaging limited adherence and follow-up care after the study period. The Lindsay Leg Club model, which promotes community-based ulcer care, offers a promising solution.[26] This model provides wound care in informal settings such as town halls, rather than clinical facilities, and encourages peer support, community involvement, and health promotion. It has been shown to improve ulcer healing rates, reduce recurrence, enhance patient autonomy, and foster a sense of belonging and dignity.[27] Establishing "Leg Ulcer Clubs" in community settings could provide psychosocial support, reduce financial stress through pooled resources, and improve health outcomes. Such clubs can also serve as platforms for health education, routine follow-up, and emotional support—where patients learn from each other and shift focus from illness to social interaction.[26]

CONCLUSION

This study demonstrated that healing of chronic leg ulcers in patients with SCD leads to improvements in pain and psychosocial well-being. However, full psychological recovery may take longer. A comprehensive, biopsychosocial approach addressing pain, malodour, and social reintegration is essential for optimal care.

Recommendations

We recommend the integration of psychosocial interventions such as routine pain assessment, malodour management, and establishment of community-based leg ulcer care programs as part of standard nursing practice. Such interventions may not only improve outcomes in SCD but may also benefit other chronic disease populations, including patients with diabetic foot ulcers, cancer, and hypertension.

Study Limitations

This was an exploratory pilot study with a small sample size (n = 18), which may limit the generalizability of the findings. However, the results offer preliminary insights that can inform larger, more definitive studies.

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