

Original Article

Chronic wounds: why some heal and others don't? Psychosocial determinants of wound healing in older people

慢性傷口癒合與否的關鍵：長者的心理社交因素

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Chronic wounds are health problems that affect elderly patients as well as health care professionals. Its chronicity, together with its high recurrence rate, creates not only a big challenge to nurses' workload and health cost, but also has a direct impact on elderly patients' physiological and psychosocial well-being. This study explores the psychosocial well-being of elderly patients with chronic wounds and investigates the role of psychosocial factors, if any, in predicting the likelihood of chronic wound healing. The key findings of this study indicated poor psychosocial well-being of elderly patients with chronic wounds and better emotional status had a significant effect in predicting a higher proportion of complete wound healing.

慢性傷口嚴重影響患病長者的健康，同時亦為醫護人員帶來很多挑戰。慢性傷口不但難以治癒，且其復發率也很高。因此，它為醫護人士帶來非常繁重的工作量，同時更大大提高了相關的醫療成本。非但如此，慢性傷口更會造成患病長者很多生理、心理、和社交方面的問題，嚴重影響他們的生活質素。本研究的目的是探討慢性傷口對長者的心理社交狀況和測定那些心理社交因素能夠推測傷口的癒合的可能性，研究結果顯示患病長者的心理社交狀況差，而且發現較良好的情緒狀況有助預報較高的傷口癒合率。

Keywords: Chronic wound, elderly, psychosocial, venous ulcer, wound healing

關鍵詞：慢性傷口，長者，心理社交，下肢靜脈潰瘍，傷口癒合

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Introduction

Wounds are commonly classified according to their underlying causes, the tissue layers that are involved or the complications that have arisen. Normal wound healing is a predictable yet complex process consisting of three overlapping phases: inflammation, proliferation and maturation. For chronic wounds, the progression of healing through these phases is influenced by

wound site factors, systemic factors and social factors. Timmons highlighted these "three S's" in the zonal influences upon wound healing.¹ The first 'S', which represents "wound site condition", is the innermost zone. The second 'S' represents both physiological and psychological system changes associated with the patients with wounds. The third 'S' refers to social environment and social support. This model advocates a 'whole person' approach in the management of chronic wounds.

In Hong Kong, the prevalence and incidence of chronic wounds are not well documented. However, it is well known that a large number of elderly patients with chronic wounds receive wound dressings in general out-patient clinics (GOPC) or at home from community nurses on either a daily or alternate-day basis. A study conducted in the community nursing services in Kwun Tong found that there were around 200 (24%) patients receiving wound care from community nurses each month.² Of this number, around 11% had leg ulcers and 9% had pressure sores. Meanwhile, service statistics reported that more than 70% of treatment provided in GOPCs involved chronic wound care.

The persistence and recurrence of chronic wounds not only indicate substantial medical resource utilisation and costs,³ but also has a direct impact on the quality of life in elderly patients.⁴ With regards to the psychosocial aspect, a local study on 86 elderly patients with leg ulcers found that pain, immobility and lack of leisure activities were the most commonly reported problems affecting older patients' daily living.⁵ The literature also highlighted many psychosocial responses, such as feelings of helplessness, lack of control, diminished human interaction, boredom and loss of self-esteem.^{6,7} These problems may induce stress, anxiety and depression, resulting in further delay in wound healing,⁸ due to impairment of the initial inflammatory responses and disturbance of neuro-endocrine immune equilibrium.^{9,10} However, these studies have almost exclusively dealt with acute experimentally induced wounds rather than chronic wounds. Despite advances in modern wound management technology and the control of healing determinants (including patients' age, wound size and wound duration), in clinical

trials some chronic wounds rapidly respond to treatment while others still do not.

Objective

The goals of the present study are to examine the psychosocial well-being of elderly patients with chronic wounds and to identify the psychosocial factors that may predict the likelihood of wound healing.

Method

This is a retrospective study performed on data collected from 60 chronic venous ulcer patients who received daily wound dressing in a GOPC in Hong Kong. The study population comprised of male and female patients aged 55 years old or above with wound bed free from necrotic tissue or infection. The wound sizes were less than 50 cm² in area and wound duration was more than eight weeks. Patients who had bilateral leg ulcers, having a known history of sensitivity to wound dressing or receiving any pharmacological treatment that might affect ulcer healing, such as corticosteroids, were excluded from the study.

Complete wound healing in this study was defined as complete epithelialisation. All participants received standardised treatment given by the research nurses throughout the 12-week treatment period. The selection of topical wound dressing and frequency changes were guided by a clinical protocol which is a combination of the Wound Staging System developed by Falanga¹¹ and the wound dressing decision guide formulated by the wound manager of the manufacturing company (Table 1). All wound dressing materials used in this study were sponsored by the Lohmann and Rauscher Ltd.

This study examined the psychosocial well-being of elderly patients with chronic wounds prior to the study and assessed the status of complete wound healing at week 12. Complete ulcer healing was double-checked by two researchers at the research clinic and images were recorded by the

Table 1. Wound staging system and decision guide

Wound staging system			
Wound bed appearance	Granulation tissue	Fibrinous tissue	Eschar
A	100%	–	–
B	50-100%	+	–
C	<50%	+	–
D	Any amount	+	+
Exudate	Extent of control	Amount	Frequent of dressing
1	Fully	None/minimal	Weekly
2	Partially	Moderate	Every 2-3 days
3	Uncontrolled	Very exudative	Daily
Wound dressing decision guide			
	1	2	3
A	Hydrocolloid	Non-adhesive dressing	Absorbant
B	Hydrocolloid	Foam	Alginate & Absorbant
C	Hydrocolloid	Foam	Alginate & Foam
D	Hydrogel & Non-adherence dressing	Hydrogel & Foam	Alginate & Foam

VeV MD stereophotogrammetry. Psychosocial well-being, such as pain severity and its interference, was measured by the Chinese version of the Brief Pain Inventory (BPI-C),¹² while disease-specific and generic health-related quality of life was measured by the Chinese version of the Charing and Cross Venous Ulcer Questionnaire (CCVUQ-C),¹³ and The Chinese (Hong Kong) SF-12 Health Survey (SF-12-C)¹⁴ respectively. The BPI-C and SF-12-C were well validated in Taiwan and Hong Kong. The CCVUQ-C was translated from its English version into Chinese by using Brislin's model of translation locally. The psychometric properties were confirmed by confirmatory factor analysis using LISREL. All questionnaires were administered by research nurses. Data analysis involved the use of descriptive statistics and inferential statistics such as frequency count and multiple logistic regression. Multivariate logistic regression for examining the effect of these three psychosocial impacts with an adjustment of patient's age, wound size, and wound duration was also performed.

Results

Sixty elderly patients with chronic venous ulcers were involved in this study. They all had a

unilateral ulcer on the lower leg for more than eight weeks. As shown in Table 2, majority of the patients were female and had reached primary level education. Their mean age was 68.8 years old with a standard deviation of 9.5 years, and about a quarter (23%) of the participants was living alone. About 75% of them had already retired, with 23% receiving financial support from the Comprehensive Social Security Assistance (CSSA). With regards to ulcer characteristics (Table 3), the mean ulcer size was 9.2 cm² (range: 0.41-41.7), with a mean ulcer duration of 22.3 months (range: 2-120). The location of the ulcer was evenly located at four sites of the leg. The majority of the ulcers had more than 50% granulating tissue at the wound bed and with moderate exudates that required alternate-day dressing changes.

At week 12, 17 out of 60 (28%) patients had healed. This meant that 43 (72%) had not yet healed. There was no significant difference in the proportion of patients with hypertension, diabetic mellitus, and heart disease between the healed and non-heal groups. Despite similar patient and wound characteristics, underlying causes, presence of comorbidities and treatment regimens, some wounds rapidly responded to

Table 2. Socio-demographic data of the participants in the study

Socio-demographic data		Study participants (n=60)	
		Frequency	(percentage)
Gender	Female	39	65%
	Male	21	35%
Education	Illiterate	11	18%
	Elementary education (Primary)	37	62%
	Higher education (Secondary)	12	20%
Age	55-75 years	38	63%
	>75 years	22	37%
Mean age	68.8 years (SD 9.5; range 55-89)		
Living arrangement	Alone	14	23%
	With spouse only	18	30%
	With family members	28	47%
Source of financial support	CSSA	14	23%
	Job	15	25%
	Family	31	52%

CSSA = Comprehensive Social Security Assistance

Table 3. Wound characteristics of the participants in the study

Wound characteristics		Study participants (n=60)	
		Frequency	(percentage)
Mean size	9.2 cm ² (Range 0.41-41.7)		
Mean duration	22.3 months (Range 2-120)		
Ulcer location	Rt. malleolus	12	20%
	Rt. gaiter area	12	20%
	Lt. malleolus	15	25%
	Lt. gaiter area	21	35%
Wound bed condition	100% granulation tissue	16	27%
	50-100% granulation tissue	28	47%
	<50% granulation tissue	11	18%
	Presence of fibrinous material and eschar	5	8%
Exudates control	Fully controlled with minimal exudates	25	41.3%
	Partially controlled with moderate exudates require alternate day dressing	34	57%
	Very exudative wound requiring daily dressing	1	1.7%

treatment as compared to others. With regard to the overall psychosocial well-being of all study participants, Table 4 showed that chronic wound elderly patients experienced pain and its interference with a mean of 5.05 and 3.67, respectively (a higher scoring indicates more pain and its interference on daily life). In the generic health-related quality of life measure, an overall score of 39.2 to 44.5 out of 100 was attained. The

disease-specific health-related quality of life scoring was around 52.6 (a higher score indicates a better generic health-related quality of life and poorer disease-specific health-related quality of life). With regard to the group differences, student t-test showed no statistically significant difference between healed and non-heal elderly patients among all psychosocial comparisons between the main constructs.

However, further analysis performed on the four subscales of the CCVUQ-C detected a statistical significant odds ratio (OR) in the emotional status (Table 5). The OR of emotional status subscale was 1.10 with 95% C.I. (1.01-1.14), confounding for patients' age, wound size, and wound duration. Meanwhile, the ORs of social interaction, domestic activity and cosmetic concern ranged from 0.96-0.99 which indicated no significant effects. The result showed a 95% confidence level in predicting a 10% increase in likelihood of complete wound healing for a certain level of improvement in emotional status.

Discussion

The treatment for chronic wounds is a major challenge that entails significant patient and health costs. The psychosocial predictors for wound healing are important in identifying potential slow healing cases that may be benefited from psychosocial interventions which have been extensively used in the management of chronic diseases.

Chronic wound is generally considered as pain-free unless it is associated with bacterial infection. For venous ulcers, the pain is worst when the legs are dependent, and the pain is relieved when the legs are elevated. Results from pain severity and pain interference in this study reflect an overall mild to moderate impact on elderly patients' life. Some people may still consider a score of 3 to 5 as a mild to moderate impact on life. However, in the presence of wound, this kind of life disturbance takes place everyday and goes on continuously over several years. Most importantly, some aspects of pain interference on mood induce stress response, thereby resulting in an elevation of catecholamines and cortisol, which both eventually suppress the immune system, break down the vital nutrients for cell development and reduce the supply of oxygen and nutrients for wound healing. In addition, the interference with sleep will maintain this high level of catecholamines and cortisol at night and thus further prolong the inflammatory phase of ulcer healing.

Table 4. Psychosocial outcomes of the participants in the healed and not heal groups

Outcome variables	Total (n=60)	Healed (n=17)	Not heal (n=43)	t-test compared between healed and not heal
				p-value
Pain severity of BPI-C (0-10)*	5.05	4.3	5.4	0.278
Pain interference of BPI-C (0-10)*	3.67	3.3	3.8	0.589
Physical component summary of SF-12-C (0-100)*	39.20	41.2	38.5	0.393
Mental component summary of SF-12-C (0-100)*	44.50	45.2	44.2	0.815
Total Score of CCVUQ-C (0-100)*	52.60	54.6	51.8	0.445

* = Possible score range of the scale; BPI-C = Brief Pain Inventory (Chinese version); SF-12-C = The Chinese (Hong Kong) SF-12 Health Survey; CCVUQ-C = Charing Cross Venous Ulcer Questionnaire (Chinese version)

Table 5. Odds ratios of emotional, social, domestic, and cosmetic subscales for wound healing confounding for patients' age, wound size and wound duration

Factor	Odds ratio	95% CI		p-value
		Lower	Upper	
Emotional status	1.10	1.01	1.14	0.018
Social interaction	0.99	0.949	1.05	0.914
Domestic activity	0.99	0.926	1.07	0.860
Cosmetic concern	0.96	0.907	1.02	0.154

Results from CCVUQ-C and SF-12-C reflect an overall poor psychosocial well-being in elderly patients with chronic wounds. Furthermore, this study highlights the impact of emotional responses on wound healing. There are five questions under the subscale of emotional status. These are as follows: (1) I am worried that my ulcer will never heal; (2) I feel depressed because of my leg ulcer. (3) My ulcer has put a strain on my personal relationships; (4) I am fed up with the amount of time it takes to treat my ulcer; and (5) I spend a lot of time thinking about my ulcer. The scores in these five questions were calculated under different weights. In particular, they highlight the impact of wounds on social interactions, time spent and wound progress. In fact, they are found to be highly correlated to stress. Special attention should therefore be given to the emotional status such as anxiety and depressive symptoms. It is suggested that psychosocial interventions, such as 'wound club' and 'relaxation exercise', may enable a more focused and dedicated care to meet psychosocial needs.

This study supports Timmons' suggestion of looking beyond the wound site condition and be alert about psychosocial factors that may delay wound healing. The limitation of this study was that the sample size was small and that limited the examination of a more comprehensive set of predictors on wound healing. Moreover, the study design could not indicate any cause and effect relationship between ulcer healing and psychosocial factors. To deliver high quality and effective wound care, it is important that factors contributing to poor wound healing be identified and tackled with full attention. Further trials in evaluating the effect of possible psychosocial interventions, such as 'wound club' and 'relaxation exercise' in chronic wounds, are thereby recommended.

In conclusion, this study firstly highlights the overall poor psychosocial well-being of elderly patients with venous ulcers. Secondly, this study emphasizes the possible impact of pain and its interference, and emotional status on wound healing. Special attention should therefore be given to these factors in elderly patients with

chronic wounds. Lastly, the recommendation is that psychosocial assessment is an important part of the overall assessment of patients with chronic wounds. Nurses working in the community have a key role in the identification and monitoring of elderly patients with chronic wounds who may be at risk for anxiety and depression, thus requiring psychosocial support for effective wound healing to take place.

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