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ORIGINAL RESEARCH

Analysis of the Current Status of Perceived Stress and Factors Associated with It in Patients with Chronic Wounds: A Cross-Sectional Study

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Objective: This study aimed to assess perceived stress levels in patients with chronic wounds and examine the associations between perceived stress and demographic factors, clinical characteristics, wound healing status, social support, and coping styles.

Methods: We conducted a cross-sectional study from December 2023 to August 2024 at the Wound Care Clinic of the First Affiliated Hospital of Xi'an Jiaotong University. A convenience sampling method was used to recruit 292 patients with chronic wounds who received standardized wound treatment. Data were collected using the general information questionnaire, Chinese Perceived Stress Scale (CPSS), Pressure Ulcer Scale for Healing (PUSH), Social Support Rating Scale (SSRS), and Simplified Coping Style Questionnaire (SCSQ). Statistical analysis utilized Spearman correlation and multiple linear regression to identify factors associated with perceived stress.

Results: The mean perceived stress score among the 292 participants was 34.98±7.03, with 78.8% reporting clinically significant stress (score>28). Multiple linear regression analysis showed a positive correlation between perceived stress and marital status, comorbid chronic diseases, and wound healing status in patients with chronic wounds. Patients who were married, had multiple chronic diseases, or exhibited poor wound healing tended to have higher perceived stress. Conversely, social support and positive coping maintained inverse relationships with perceived stress, suggesting that patients with strong social support and positive coping style experienced lower stress levels. Together, these factors accounted for 42.7% of the variance in perceived stress.

Conclusion: Chronic wound patients commonly exhibit moderate-to-high levels of perceived stress. Healthcare providers should systematically assess patients' perceived stress levels and implement individualized interventions, including enhancing social support networks and teaching positive coping strategies, to alleviate perceived stress and ultimately improve wound healing outcomes.

Keywords: chronic wound, perceived stress, social support, coping style, risk factors

Introduction

Chronic wounds are defined as wounds that remain unhealed after one month of standard treatment and exhibit a tendency not to heal, including diabetic foot ulcers, pressure injuries, and vascular ulcers, among others.[1] Epidemiological data from a systematic review indicate a global occurrence rate of 2.21 cases per 1000 population.[2] In the United States, the proportion of Medicare beneficiaries with chronic wounds climbed from 14.5% in 2014 to 16.3% in 2019.[3] Similarly, in northern China, the prevalence among hospitalized patients more than doubled, surging from 0.94% in 2014 to 2.64% in 2017.[4] With demographic aging and the increasing incidence of metabolic disorders, the prevalence of chronic wounds is projected to continue rising.

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The healthcare burden associated with chronic wounds demonstrates significant cross-national consistency. Globally, chronic wound treatment costs account for approximately 4% of total healthcare expenditure and consume 68% of care time.[5] Country-specific analysis reveals that Australia allocates 3.5 billion Australian dollars (AUD) annually, which is about 2% of the healthcare budget.[6] The United States spends more than 25 billion United States dollars per year.[7] Whereas in China, the cost of chronic wound management for hospitalized patients has escalated significantly, increasing from 3.68 million Chinese Yuan (CNY) in 2014 to 8.9 million Chinese Yuan (CNY) in 2017, while its share of total healthcare expenditures rose from 1.23% to 3.18% during this period.[4] Although the exact proportion of expenditures varies across countries, the high medical costs and resource demands imposed by chronic wounds pose a global challenge for healthcare systems. Given China's vast population and heterogeneous healthcare system, studying chronic wounds in Chinese patients not only reveals nation-specific clinical features but also provides a unique perspective and actionable insights for global chronic wound management.

In addition to the substantial healthcare burden, chronic wounds directly impair patients' physical and mental health. According to Olsson's findings, impaired mobility and pain represented the most frequently reported symptoms among chronic wound patients.[8] Pain induces mobility limitations, sleep disorders and reduced food intake, damaging interpersonal relationships and leading to psychological burdens in patients.[9] Wound odor and exudate impair patients' self-image, which increases their social isolation and psychological stress.[10] Furthermore, chronic wounds are difficult to treat and require long-term care, requiring patients to bear substantial healthcare expenditures. A survey indicated that the average treatment cost per patient with chronic wounds can reach 12055.4 Chinese Yuan (CNY).[11] These high treatment costs place a heavy economic burden on families, further aggravating the patients' perceived stress.

Perceived stress serves as a core indicator in psychological stress assessment. It refers to the mental state that arises when individuals consciously recognize and process stressful situations. This state manifests as feelings of tension and a sense of uncontrollability in both psychological and physiological domains.[12] Previous studies have shown that patients experiencing stress-related conditions exhibit a 3.6-fold slower wound healing rate compared to control patients.[13] Perceived stress impairs wound healing through the neuroendocrine, immune, and behavioral pathways.[14] Specifically, chronic stress triggers the activation of two key neuroendocrine pathways: the Hypothalamic-pituitary-adrenal (HPA) axis and the Sympathetic-adrenal-medullary (SAM) system. This activation leads to elevated secretion of stress hormones, including cortisol and catecholamines, which exert a biphasic time-course effect on wound healing. Acute-phase suppression of pro-inflammatory cytokines such as IL-1β and TNF-α delays the initiation of inflammation;[15] while the chronic phase induces excessive inflammatory response and elevates the levels of neutrophil elastase and matrix metalloproteinases, shifting the wound microenvironment from tissue synthesis to matrix degradation, thereby impeding wound healing.[16] Such an imbalance in immune regulation is the main reason for impaired wound healing. Behaviorally, individuals with elevated perceived stress exhibit higher tendencies toward alcohol abuse, smoking, sleep disorders, and eating disturbances.[17] These health-risk behaviors reduce immune function and repair ability, indirectly hindering wound healing.[14] However, the prolonged healing of wounds, the persistent symptoms, and the high treatment cost greatly increase the patient's perception of stress. This bidirectional relationship forms a vicious cycle between impaired healing and perceived stress. Therefore, it is vital to implement routine assessment of perceived stress in chronic wound patients and adopt appropriate stress-reduction interventions.

Previous studies identified that patient demographics and disease characteristics may predict perceived stress levels,[18,19] with social support and coping styles serving as important mediators.[20–22] For instance, Dehghan et al[23] demonstrated that good emotional support and informational support significantly alleviate perceived stress and enhance quality of life among cancer patients. However, to our knowledge, systematic quantitative studies on perceived stress among chronic wound patients remain lacking. Therefore, the aim of this study was to assess perceived stress levels in this population and examine associations with demographic factors, disease characteristics, social support, and coping styles. Our findings would provide a theoretical basis for healthcare providers to develop stress intervention programs for patients with chronic wounds.

Methods

Study Design and Participants

This study assessed perceived stress levels among patients with chronic wounds using a cross-sectional design. Participants were selected through convenience sampling from chronic wound patients who receiving standardized wound treatment (including specific interventions such as debridement and dressing change) from September 2023 to August 2024 in the Wound Care Clinic of the First Affiliated Hospital of Xi'an Jiaotong University. Inclusion criteria were: (1) Wounds lasting 1 month or longer, (2) age≥18 years, (3) intact comprehension and communication abilities, and (4) voluntarily participated in the study and signed the informed consent. Exclusion criteria were: (1) Impaired vital organ function or other serious chronic comorbidities such as end-stage hepatic/renal disease and acute respiratory failure. (2) diagnosed neurocognitive disorders or other psychiatric disorders.

Sample Size Estimation

The sample size estimation was calculated based on methodological approaches for studies examining influencing factors of related variables,[24] requiring a minimum sample size 5 to 10 times the number of variables, with an additional 20% allowance for anticipated attrition. This study comprised 21 variables and a sample size ranging from 132 to 263 cases. Ultimately, 292 patients were included in this study, meeting the sample size criteria.

Research Tools

General Information Questionnaire

The research team developed a general information questionnaire based on a review of the literature, including demographic and disease characteristics. Demographics comprised gender, age, place of residence, marital status, employment status, among others, and disease characteristics included wound type, duration, and associated symptoms.

Chinese Perceived Stress Scale (CPSS)

The scale was originally developed by Cohen et al.[25] Subsequently, Yang et al[12] cross-culturally adapted the PSS (Perceived Stress Scale) through forward and reverse translation, revising its comprehensive structure and items to ensure cultural appropriateness for Chinese populations. The 14 items were categorized into two dimensions: tension and uncontrollability, enhancing their relevance to the domestic cultural environment. The scale is based on a 5-point Likert scale with total scores ranging from 0 to 56. Higher composite scores indicate greater perceived stress level, categorized as: 0–28 indicating normal stress perception, 29–42 representing moderate-to-high perceived stress, and 43–56 denoting high stress perception.[26] The scale's Cronbach's α coefficient was 0.78, with good reliability.

Pressure Ulcer Scale for Healing (PUSH)

The PUSH was designed by the National Pressure Ulcer Advisory Panel (NPUAP) in 1997 and published in 1998.[27] Jiang et al[28] translated it into Chinese in 2015. It is mainly used to assess the healing status of pressure injuries. The PUSH consists of three items: wound area, exudate volume, and tissue type. With a total score between 0 and 17, 0 indicates that the wound has healed. A higher score implies poorer wound healing. Recent studies have shown that the PUSH can also be used to evaluate the degree of healing of chronic wounds such as venous ulcers, diabetic foot, and chronic surgical wounds.[29,30] The scale exhibits excellent internal consistency, with a Cronbach's α coefficient of 0.823, confirming its reliability for clinical and research applications.

Social Support Rating Scale (SSRS)

The scale, developed by Xiao in 1987,[20] was informed by international measures and is mainly used to assess individuals' social support levels. This scale comprises three dimensions: objective support, subjective support, and support utilization, totaling 10 items. Scores range between 12 and 66 on this scale, where elevated totals reflect stronger perceptions of social support. Cronbach's α coefficient for this scale was 0.92.

Simplified Coping Style Questionnaire (SCSQ)

The questionnaire was developed by Xie[31] for the Chinese cultural context, covering both positive and negative coping dimensions. It utilizes a 4-point Likert format, with 0 indicating non-adoption and 3 indicating frequent adoption. The scale comprises 20 items, with items 1–12 pertaining to the positive coping dimension (scoring range of 0–36) and the remaining items corresponding to the negative coping dimension (scoring range of 0–24). By comparing the average scores of the items in the two dimensions, the coping style adopted by individuals when facing stress, difficulties, or challenges can be evaluated. The Cronbach's alpha coefficient for the scale was 0.90.

Data Collection

All research staff received standardized training on data collection. Trained personnel then screened patients at the wound care clinic in accordance with inclusion/exclusion criteria. The research staff first established a good relationship with the patients, and after gaining trust, explained the study purpose and significance in detail. Questionnaires were administered after obtaining signed informed consent. During the survey, staff used a standardized guide to explain questionnaire completion. Patients preferred to fill in the survey themselves. For patients with poor vision and difficulties in filling out the questionnaire, the staff recorded the answers and confirmed them on behalf of the patients through a question-and-answer format. All questionnaires were returned on the spot. Two independent team members verified data and manually excluded invalid questionnaires.

Data Analysis

Two researchers carried out data input to ensure the accuracy of the data. Data were analyzed using SPSS 26.0 software. Frequency and percentage were used to describe the count data, and the mean±standard deviation was used to express the measurement data. Potential variables affecting perceived stress were identified by univariate analysis of variance (χ^2). The relationship between perceived stress, wound healing, social support, and coping styles was determined by Spearman correlation analysis. All potential variables identified through univariate analysis and correlation analysis were included as independent variables in the multiple linear regression model. The difference was statistically significant at $P<0.05$.

Results

Current Status of Perceived Stress Level Among Chronic Wound Patients

The average CPSS score of patients with chronic wounds in this study was 34.98±7.03. Mean scores were 18.00±3.54 for the tension dimension, and 16.98±4.08 for the uncontrollability dimension. Among these participants, 21.2% demonstrated normal perceived stress (CPSS≤ 28 points), while 78.8% exhibited clinically significant stress (with 62.7% showing moderate-to-high and 16.1% showing high levels of perceived stress).

Demographic Characteristics and Univariate Analysis of Perceived Stress in Chronic Wound Patients

During the survey, we screened 303 chronic wound patients who met the inclusion and exclusion criteria. Eight patients declined participation and three failed to complete the questionnaires, giving a final sample size of 292: 159 males and 133 females, with 182 participants under 60 years of age, and 110 aged 60 and over. Among these participants, 65 presented with diabetic foot ulcers, 59 with venous lower extremity ulcers, 42 with chronic surgical wounds, and 37 with chronic traumatic wounds. Stratified χ^2 analysis revealed that participants with pressure injuries who were aged ≥60 years, widowed or divorced, had lower educational attainment, reduced monthly income, or multiple chronic comorbidities were more likely to exhibit clinically significant perceived stress (CPSS>28). Details are shown in Table 1.

Correlation Analysis of Perceived Stress with PUSH, Social Support, and Coping Styles Among Chronic Wound Patients

Patients exhibited mean scores of 9.77±3.29 on the PUSH, 35.29±5.12 for social support, 1.29±0.42 on positive coping items, and 1.90±0.35 on negative coping items. Spearman correlation analysis indicated that the total and dimensional

Table 1 Demographic Factors Associated with Perceived Stress in Chronic Wound Patients (n=292)

Characteristics	n	Normal Perceived Stress (n=62)	Clinically Significant Perceived Stress (n=230)	χ^2	P
Sex				0.005	0.945
Male	159	34 (21.4%)	125 (78.6%)		
Female	133	28 (21.1%)	105 (78.9%)		
Age				7.634	0.006
<60	182	48 (26.4%)	134 (76.3%)		
≥60	110	14 (12.7%)	96 (87.3%)		
Residence				3.091	0.079
City	184	45 (24.5%)	139 (75.5%)		
Country	108	17 (15.7%)	91 (84.3%)		
Marital status				8.873	0.012
Unmarried	38	13 (34.2%)	25 (65.8%)		
Married	219	47 (21.5%)	172 (78.5%)		
Other (divorced or widowed)	35	2 (5.7%)	33 (94.3%)		
Educational level				21.568	<0.001
Primary and below	75	6 (8.0%)	69 (92.0%)		
Junior high school	76	12 (15.8%)	64 (84.2%)		
Senior high school	63	16 (25.4%)	47 (74.6%)		
University	66	22 (33.3%)	44 (66.7%)		
Master's degree or above	12	6 (50.0%)	6 (50.0%)		
Employment status				3.750	0.153
Working	187	34 (18.2%)	153 (81.8%)		
Retired	56	13 (23.2%)	43 (76.8%)		
Unemployed	49	15 (30.6%)	34 (69.4%)		
Monthly income (CNY)				9.275	0.010
≤$3000	68	7 (10.3%)	61 (89.7%)		
$3001–5000	131	27 (20.6%)	104 (79.4%)		
>$5000	93	28 (30.1%)	65 (69.9%)		
Payment				3.283	0.194
Social insurance	126	24 (19.0%)	102 (81.0%)		
Commercial insurance	5	0 (0%)	5 (100.0%)		
Self-pay	161	38 (23.6%)	123 (76.4%)		
Sleep (h)				5.568	0.062
<5	37	3 (8.1%)	34 (91.9%)		
5–8	237	53 (22.4%)	184 (77.6%)		
>8	18	6 (33.3%)	12 (66.7%)		
Wound duration				4.942	0.085
1–3 months	207	51 (24.6%)	156 (75.4%)		
4–6 months	48	6 (12.5%)	42 (87.5%)		
>6 months	37	5 (13.5%)	32 (86.5%)		
Wound symptoms				0.004	0.952
<3	114	24 (21.1%)	90 (78.9%)		
≥3	178	38 (21.3%)	140 (78.7%)		
Combined chronic disease				7.816	0.020
0	117	32 (27.4%)	85 (72.6%)		
1–2	148	29 (19.6%)	119 (80.4%)		
≥3	27	1 (3.7%)	26 (96.3%)		

(*Continued*)

Table 1 (Continued).

Characteristics	n	Normal Perceived Stress (n=62)	Clinically Significant Perceived Stress (n=230)	χ^2	P
Chronic wound type				22.840	0.004
Diabetic foot ulcer	65	9 (13.8%)	56 (86.2%)		
Venous leg ulcer	59	11 (18.6%)	48 (81.4%)		
Arterial ulcer	22	3 (13.6%)	19 (86.4%)		
Pressure injury	13	0 (0.0%)	13 (100.0%)		
Malignant fungating wound	26	4 (15.4%)	22 (84.6%)		
Surgical wound	42	10 (23.8%)	32 (76.2%)		
Traumatic wound	37	13 (35.1%)	24 (64.9%)		
Abscess incision	14	4 (28.6%)	10 (71.4%)		
Other wounds	14	8 (57.1%)	6 (42.9%)		

Notes: Normal perceived stress was defined as CPSS≤28, while clinically significant perceived stress was classified as CPSS>28.
Abbreviations: CNY, Chinese Yuan.

Table 2 Correlation Analysis of CPSS with PUSH, Social Support, and Coping Styles Among Chronic Wound Patients

Variables	Tension Score	Uncontrollability Score	Total Score
PUSH	0.361**	0.421**	0.411**
Social support	−0.430**	−0.417**	−0.450**
Positive coping	−0.403**	−0.475**	−0.469**
Negative coping	0.202**	0.245**	0.226**

Note: **P<0.01.
Abbreviation: PUSH, Pressure Ulcer Scale for Healing.

score of CPSS in patients with chronic wounds was positively correlated with PUSH (r=0.421, P<0.01) and negative coping (r=0.287, P<0.01), while demonstrating inverse relationships with social support (r=−0.452, P<0.01) and positive coping (r=−0.368, P<0.01). These findings are presented in Table 2.

Multiple Linear Regression Analysis of Perceived Stress in Chronic Wound Patients

Multiple linear regression analysis was conducted using the total CPSS score as the dependent variable and statistically significant univariate analysis variables, as well as the PUSH score, total social support score, positive coping score, and negative coping score as independent variables. Details of how the independent variables were assigned are shown in Table 3. The results showed that marriage, comorbid chronic disease, PUSH, social support, and positive coping were significantly associated with perceived stress in chronic wound patients (P<0.05), accounting for 42.7% of the variance, as illustrated in Table 4.

Table 3 Assignment of Independent Variables

Variables	Assignment Method
Age	1= <60 years; 2= ≥60 years
Marital status	"Unmarried" as a reference, setting 2 dummy variables for "Married" and "Other (divorced or widowed)"
Educational level	1= Primary and below; 2= Junior high school; 3= Senior high school; 4= university; 5=master's degree and above
Monthly income (CNY)	1= ≤3000; 2=3001–5000; 3= >5000
Combined chronic diseases	1=0; 2=1–2; 3=≥3

(*Continued*)

Table 3 (Continued).

Variables	Assignment Method
Wound type	"Diabetic foot ulcer" as a reference, setting "Venous leg ulcer", "Arterial ulcers", "Pressure injury", "Malignant fungating wound", "Surgical wound", "Traumatic wound", "Abscess incision", and "Other wound" 8 dummy variables
PUSH	Original value input
Social support	Original value input
Positive coping	Original value input
Negative coping	Original value input

Abbreviations: CNY, Chinese Yuan; PUSH, Pressure Ulcer Scale for Healing.

Table 4 Multiple Linear Regression Analysis of Factors Associated with Perceived Stress in Chronic Wound Patients

Variables	Unstandardized Coefficient		Standardized Coefficient	t	p
	β	Standard Error	Beta		
(constant)	46.621	4.729	–	9.859	<0.001
Married	2.293	1.141	0.142	2.009	0.046
Combined chronic diseases	1.604	0.561	0.144	2.861	0.005
PUSH	0.559	0.110	0.262	5.088	<0.001
Social support	−0.465	0.077	−0.339	−6.009	<0.001
Positive coping	−0.307	0.070	−0.222	−4.370	<0.001

Notes: R^2 = 0.462, R^2_{adj} = 0.427, F=13.035, P=0.000; "–" means no such data; only statistically significant variables are presented (P<0.05).
Abbreviation: PUSH, Pressure Ulcer Scale for Healing.

Discussion

This study revealed a significant perceived stress burden among individuals suffering from chronic wounds. The average CPSS score of this population was 34.98±7.03, above the scale's midpoint (28), signifying a moderately high stress level. Comparative analysis showed that the perceived stress level in this study population was higher than the score reported by patients with coronary artery disease (27.16±6.35).[32] The reason for this is that patients with chronic wounds not only have to cope with the psychological burden of the underlying disease, but also suffer from long-term symptoms such as wound odor, exudation, and pain.[10] This superimposed effect of psychological burden and physical symptoms may be a key factor contributing to their elevated levels of perceived stress. In addition, our findings demonstrated marginally higher scores in the tension dimension compared to the uncontrollability dimension. It indicated that when chronic wound patients faced stressful situations such as disease distress and environmental changes, they had difficulty in effectively dealing with worries and problems due to limited disease knowledge and poor understanding of wound management,[33,34] resulting in increased tension. Healthcare providers ought to provide patients with systematic education on wound care knowledge and training on emergency management skills, while instructing them in stress management skills, and assisting in the development of a robust social support network. This multidimensional intervention model is designed to enhance patients' ability to cope with wound emergencies and improve disease adaptation, thereby alleviating the perception of stress.

In our study, married patients with chronic wounds were more vulnerable to heightened stress perception, contrasting with Langford's conclusion that unmarried patients exhibited greater stress due to insufficient emotional support.[35] It should be noted that this study only collected marital status data and did not assess the quality of the marital relationship, representing a limitation of this study. Through in-depth analysis, we identified that this discrepancy may primarily stem from married patients serving as the primary financial providers for their families. However, the decline in work capacity

caused by chronic wounds significantly impacts household income, with data indicating that over 12% of workers with venous ulcers consequently retire prematurely.[36] Furthermore, the economic burden associated with chronic wound treatment is substantial, as evidenced by the extension of average hospitalization duration from 14 to 31 days, accompanied by a daily cost increase exceeding 1,000 Chinese Yuan (CNY).[37] These accumulated long-term medical expenses further exacerbate financial strain on families, consequently amplifying perceived stress in patients. Notably, clear and transparent communication regarding medical costs has been shown to mitigate patients' financial stress.[38] Therefore, healthcare providers should pay particular attention to the psychological well-being of married patients, proactively discuss treatment expenses during clinical consultations, and assist in selecting economically feasible treatment plans to effectively alleviate their financial burden.

The results of this study demonstrated a significant positive correlation between multimorbidity and perceived stress in chronic wound patients, suggesting that disease accumulation may exacerbate psychological stress through multiple pathways. This finding is consistent with the research conclusions of Zhang et al[39] on patients suspected of having COVID-19. During the investigation, it was found that these patients often have comorbidities such as diabetes, hypertension, and coronary heart disease. With the growing number of chronic diseases, the complexity of the condition and the difficulty of treatment increase significantly, which is manifested in a longer wound healing cycle and an increased need for medical intervention. Patients not only require long-term pharmacotherapy but also strict self-monitoring and regular clinical reassessments, with some necessitating surgical management. These factors collectively contribute to cumulative physical discomfort and financial burdens, potentially serving as an important mechanism of higher perceived stress. Notably, Whitehead et al[40] confirmed in a systematic review that mobile health applications can significantly improve the self-management level of chronic disease patients. Therefore, it is recommended that healthcare providers adopt a collaborative model of "online health platform + offline personalized guidance" to improve patients' awareness of chronic diseases and self-management capabilities, thereby reducing the physical and mental burden of multimorbidity.

This study found that patients with poorer wound healing (higher PUSH scores) were more likely to exhibit clinically significant perceived stress. This association is mainly reflected in two aspects. First, poor wound healing directly affects the patient's daily life, social life, and work ability. Second, poorer wound healing means that patients and their families need to spend more time, energy, material, and financial resources, which not only exacerbates the mental stress of patients but also intensifies the caregiver's caregiving burden, thereby further amplifying patients' perceived stress. It is noteworthy that there is a bidirectional mechanism of action between wound healing and stress perception; chronic stress perception delays wound healing,[14] and poor healing in turn reinforces the patient's perceived stress. Britto et al[41] found that selecting the appropriate dressing will shorten the wound healing time, indirectly improving the patient's psychological state. In clinical practice, it is recommended to take the PUSH score as the basis and combine the application of advanced dressing with psychosocial support to achieve the synergistic promotion of patients' physiological rehabilitation and psychological adjustment. However, while the PUSH composite score integrates wound size, exudate, and tissue type, the lack of independent wound measurements may limit direct comparisons with studies using planar area assessment parameters. Future work should incorporate standardized size documentation.

Social support refers to the material and psychological assistance that people obtain from their social networks, which can reduce the adverse effects of stress on an individual's psychological and physical health.[20] Our study found that chronic wound patients with lower social support were more prone to experience perceived stress, consistent with the conclusions of Dehghan et al[23] and Mohammedhussein et al,[42] both confirming an inverse correlation between perceived stress and social support. When facing the stressful event of chronic wounds, the companionship of family members, friends, and medical staff can help patients adopt positive coping styles.[43] Zeng et al[44] found that role model education can improve patients' psychological barriers and stimulate seeking health-promoting behaviors. Therefore, healthcare providers should promptly screen chronic wound patients with low levels of social support. Based on fully mobilizing family support, a role model education group for healthcare patients should be organized to enhance patients' coping resources through peer support networks and improve their psychological resilience in the face of stressful challenges.

Coping styles refer to the cognitive and behavioral approaches people take when experiencing frustration and stressful events, classified into two types: positive and negative coping.[31] The results of our study indicated that there was an inverse relationship between positive coping and perceived stress, aligning with the findings of Peng et al[22] and Shamsaei

et al,[23] whose research also confirmed that positive coping alleviates the perception of stress. Positive coping with illness enhances patients' treatment confidence, making them more willing to seek help from family and friends to alleviate stress;[45] while prolonged wound healing may also deplete patients' coping resources, as evidenced by the higher mean score of negative coping items in this study. Relaxation therapy and positive psychological interventions have been shown to reduce patients' psychological stress and form positive emotional states.[46,47] Healthcare providers can conduct psychotherapy in groups or individually to assist patients with chronic wounds in learning strategies to cope with stress and change negative thinking patterns.

Limitations

There are several limitations to this study. First, the study subjects were recruited exclusively from a single tertiary hospital in Xi'an, which may affect the generalizability of some findings. Second, the self-reported nature of the survey could introduce potential biases or overestimation, lacking objective validation. Third, no follow-up observation was conducted in this study, and a longitudinal study can be carried out in the future to establish the longitudinal change trajectory of perceived stress in chronic wound patients, thereby providing a time-series database for causal mechanism research.

Conclusion

This cross-sectional analysis showed that perceived stress is prevalent among chronic wound patients, with a moderately high level. Married status, increased number of comorbid chronic diseases, and poor wound healing were strongly associated with elevated stress perceptions, whereas good social support and positive coping showed a protective effect. Based on the current findings, screening for perceived stress in this population should be emphasized in clinical practice and managed through targeted interventions such as mobilizing social support systems and promoting positive coping with illness. It is important to note that these associations may reflect bidirectional effects—that is, chronic wounds may simultaneously affect marital relationships, social support, and stress perception. However, the current study design cannot allow for the identification of causality, and future longitudinal or experimental studies are needed to further clarify the direction and develop an early warning system integrating physiological-psychological indicators to guide stratified interventions.

Ethics Approval

This study was conducted in accordance with the principles of the Declaration of Helsinki. This study received ethical approval from the Ethics Committee of the First Affiliated Hospital of Xi'an Jiaotong University (No. XJTU1AF2024LSYY-065).

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Disclosure

The authors declare that they have no competing interests in this work.

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