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Assessing perceived stress in people with hard-to-heal wounds: case series**

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ABSTRACT

Objective: To exemplify assessment of the stress, distress, and coping perceived by patients with hard-to-heal wounds (HHW) receiving treatment in an Enterostomal Therapy outpatient clinic. **Method:** An observational, prospective secondary study, approved by the ethics committee, involving 10 adult patients with HHW who were followed over two to six consultations. The following tools were used: sociodemographic and clinical data form; Brief Pain Inventory (sensitivity — BPIS; interference — BPII); Bates-Jensen Wound Assessment Tool (BWAT); Perceived Stress Scale (PSS), which included measures of coping and distress with data expressed as means. **Results:** Patients primarily had HHW located on the lower extremities, with a mean duration of 21.2 months. The BWAT score was 23.7,the BPIS score was 4, and the BPII was 3.2. Stress was characterized by a total PSS score of 28.5 points, with a distress score of 16.4 and a coping score of 16. In the final consultation, there was a decrease of 4.3 points in BWAT, 0.8 points in BPIS, and 7.6 points in PSS, resulting in a 5.3-point reduction in distress. The BPII increased by 0.7, and coping improved by 2.2. **Conclusion:** There is a tendency for a relationship between perceived stress and wound healing, with coping influencing the perception of stress. A multidisciplinary approach is necessary, and the potential role of the wound, ostomy, and continence nurse is highlighted for the early assessment of distress and management of coping.

DESCRIPTORS: Psychological stress. Wounds and injuries. Wound healing. Case reports. Enterostomal therapy. Psychology.

Avaliação do estresse percebido em pessoas com feridas de difícil cicatrização: série de casos

RESUMO

Objetivo: Exemplificar a avaliação do estresse, distresse e *coping* percebidos por pacientes com feridas de difícil cicatrização (FDC) atendidos em ambulatório de estomaterapia. **Método:** Estudo secundário, observacional e prospectivo, aprovado pela comissão de ética, de dez pacientes adultos com FDC, acompanhados durante duas a seis consultas. Foram utilizados: formulário de dados sociodemográficos e clínicos; Inventário Breve de Dor (sensibilidade — BPIS; interferência — BPII); Instrumento de Avaliação da Ferida da Bates Jensen (BWAT) e Escala de Estresse Percebido (PSS), incluindo *coping* e distresse, com dados expressos em médias. **Resultados:** Os

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**Extracted from a Scientific Initiation internship, this is a secondary study derived from the doctoral dissertation — "Microbial burden, pain, inflammation, stress and delayed wound healing: Cohort Study," presented to the Graduate Program in Adult Health Nursing (PROESA) at the School of Nursing of the University of São Paulo (EEUSP), in 2023.

pacientes tinham FDC principalmente em membro inferior, com duração de 21,2 meses; BWAT 23,7; BPIS 4; BPII 3,2. O estresse foi caracterizado por PSS total de 28,5 pontos, distresse de 16,4 e *coping* 16. Na última consulta, foi observada diminuição de 4,3 pontos na BWAT; 0,8 na BPIS; 7,6 pontos na PSS, com 5,3 no distresse. A BPII aumentou 0,7 e o *coping* 2,2. **Conclusão:** Há tendência de relação entre estresse percebido e cicatrização, com o *coping* influenciando a percepção do estresse. Faz-se necessária uma abordagem multiprofissional e evidencia-se o potencial da atuação do enfermeiro estomaterapeuta para avaliação e manejo do distresse e do *coping* percebidos.

DESCRITORES: Estresse psicológico. Ferimentos e lesões. Cicatrização. Relatos de casos. Estomaterapia. Psicologia.

Evaluación del estrés percibido en personas con heridas de difícil cicatrización: serie de casos

RESUMEN

Objetivo: Ejemplificar la valoración del estrés, distrés, y *coping* percibidos por pacientes con heridas de difícil cicatrización (HDC), atendidos en un servicio de Terapia Enterostomal: heridas, ostomias e incontinencias. **Método:** Estudio secundario, observacional y prospectivo, aprobado por el comité de ética, de 10 pacientes adultos con HDC, atendidos entre dos a seis consultas. Fueron aplicados el Formulario de datos sociodemográficos y clínicos; el Inventario Breve del Dolor (sensibilidad — BPIS; interferencia - BPII); el Instrumento de Valoración de la Herida de Bates Jensen (BWAT); y la Escala de Estrés Percibido — PSS, la cual incluye *coping* y distrés. Los datos fueron expresados en promedios. **Resultados:** Los pacientes tenían HDC principalmente en los miembros inferiores, con duración de 21,2 meses; BWAT 23,7; BPIS 4; BPII 3,2. El estrés fue caracterizado por un PSS total de 28,5 puntos, con *coping* 16 y distrés de 16,4 puntos. En la última consulta fue identificada la disminución de 4,3 puntos en la BWAT; 0,8 en la BPIS; 7,6 puntos en la PSS con 5,3 en el distrés. La BPII aumentó 0,7 y el coping 2,2. **Conclusión:** Existe una tendencia de relación entre el estrés percibido y la cicatrización, con la resiliencia influyendo en la percepción del estrés. Se requiere un enfoque multidisciplinario y se destaca el potencial del profesional de enfermería estomaterapeuta para la evaluación temprana del distrés y el manejo de la resiliencia.

DESCRIPTORES: Estrés psicológico. Heridas y lesiones. Cicatrización de heridas. Informes de casos. Estomaterapia. Psicología.

INTRODUCTION

Nowadays, Selye's pioneering view that stress is merely an acute activation of the hypothalamic-pituitary-adrenal axis is no longer accepted[1]. The American Psychological Association defines stress as any emotional discomfort accompanied by physiological, biochemical, and behavioral changes[2]. Today, stress is more broadly characterized as a state of challenged homeostasis at the systemic, physical, or psychological level[3].

Failure to restore this balance is defined as distress and results in adverse effects on the body[4]. Distress is a dysfunctional response to stress that occurs when environmental demands exceed the individual's adaptive capacity. In such cases, stress becomes chronic and symptoms intensify, leading to both physical and psychological illness, as the body activates compensatory mechanisms to attempt to restore homeostasis[3]. This happens because the body diverts energy from essential functions to do so, which can lead to the development or worsening of chronic illnesses[5]. To overcome stressors, individuals rely on coping mechanisms[6].

Trevino et al. found that an exaggerated and prolonged stress response can perpetuate cortisol dysregulation, widespread inflammation, and pain[7]. One example of this can be seen in manifestations on the skin, such as dermatoses or wounds, which may exhibit delayed healing due to reduced cellular immunity, among other physiological alterations [8].

Wounds result from stimuli that disrupt the physical integrity of the skin. The success of tissue repair and regeneration processes depends on the patient's physical and psychological condition, as well as the severity of the lesion[9]. Currently, wound healing is understood to occur in four sequential phases: hemostasis, inflammation, proliferation, and remodeling[10]. Dysfunction in any of these stages may result in delayed healing. Thus, the normal healing progression is replaced by chronic inflammation, which becomes incapable of progressing through the normal physiological stages previously mentioned[11].

In Brazil, point prevalence estimates for hard-to-heal wounds range from 4.1% to 23.5% in populations from various healthcare settings and regions[12-14]. The main factors for delayed healing include poor control of underlying comorbidities, low adherence to treatment protocols for each wound type, acute or chronic infection, and the use of medications that interfere with normal physiological healing process[15].

Discontinuation of treatment exposes patients to significant risks, such as amputation, systemic infection, and even death. This phenomenon may be related to economic factors, lack of a support network, and patients' lack of education. It may also result from dissatisfaction with the care received and poor adherence to treatment[16].

Having an open wound leads to biopsychosocial difficulties such as pain, and wound odor, limitations in daily activities, body image disturbances, insomnia, and social isolation[17], all of which can potentially affect the patient's health-related quality of life.

Walburn et al. evaluated 63 individuals with venous leg ulcers over 24 weeks, investigating potential psychosocial predictors of healing. They found slower wound healing rates was associated with higher stress (p=0.008), depression (p=0.039), and more negative perceptions or beliefs about the ulcer (p=0.045). The authors concluded that psychological and sociodemographic factors are predictors of healing and should also be considered in treatment[18].

In an integrative literature review on psychosocial factors in patients with venous ulcers, Rodriguez and Gamboa found that the symptoms arising from psychosocial problems (such as depression) and their effects on patients' quality of life are recognized but are not explicitly monitored for early identification and timely treatment[19].

These issues underscore the importance of assessing stress for both patient profiling and future interventions. The Perceived Stress Scale (PSS) (Figure 1)[20], developed by Cohen et al. in 1983 at Carnegie Mellon University and the University of Oregon, measures the degree to which an individual perceives their life as unpredictable, uncontrollable, and overwhelming. It assesses stress over the past four weeks and contains general questions that are not tied to a specific event or situations[21].

The authors of the PSS also reported that high scores are correlated with elevated cortisol levels, immune markers, infectious diseases, and delayed wound healing. Uyar et al. confirmed this hypothesis by evaluating wound healing in 144 patients with burns. The stress levels reported by participants, measured using the PSS, were positively correlated with the percentage of burned body surface area and negatively correlated with perceived body image[22].

Scientific evidence regarding the association between perceived stress and delayed healing raises the question of why its assessment is still uncommon in healthcare services that taking care for patients with wounds. Possible explanations include: lack of knowledge by the wound care nurse and/or specialized professional regarding the patient's psychological demands; normalization of stress (being stressed is expected and does not require intervention); and the focus on wound healing with little attention to its psychological impact, resulting in low therapeutic prioritization of stress due to limited consultation time.

OBJECTIVES

To exemplify the assessment of stress, distress, and perceived coping among patients with hard-to-heal wounds treated at an Enterostomal Therapy outpatient clinic.

METHODS

This is an observational, prospective, longitudinal case series study involving ten adult patients with hard-to-heal wounds who were treated on an outpatient basis at an Enterostomal Therapy clinic. Data were extracted from a primary, prospective,

ESCALA DE ESTRESSE PERCEBIDO

Itens e instruções para aplicação

As questões nesta escala perguntam sobre seus sentimentos e pensamentos durante o último mês. Em cada caso, será pedido para você indicar o quão freqüentemente você tem se sentido de uma determinada maneira. Embora algumas das perguntas sejam similares, há diferenças entre elas e você deve analisar cada uma como uma pergunta separada. A melhor abordagem é responder a cada pergunta razoavelmente rápido. Isto é, não tente contar o número de vezes que você se sentiu de uma maneira particular, mas indique a alternativa que lhe pareça como uma estimativa razoável. Para cada pergunta, escolha as seguintes alternativas:

0= nunca
1= quase nunca
2= às vezes
3= quase sempre
4= sempre

Neste último mês, com que freqüencia...						
1	Você tem ficado triste por causa de algo que aconteceu inesperadamente?	0	1	2	3	4
2	Você tem se sentido incapaz de controlar as coisas importantes em sua vida?	0	1	2	3	4
3	Você tem se sentido nervoso e "estressado"?	0	1	2	3	4
4	Você tem tratado com sucesso dos problemas difíceis da vida?	0	1	2	3	4
5	Você tem sentido que está lidando bem as mudanças importantes que estão ocorrendo em sua vida?	0	1	2	3	4
6	Você tem se sentido confiante na sua habilidade de resolver problemas pessoais?	0	1	2	3	4
7	Você tem sentido que as coisas estão acontecendo de acordo com a sua vontade?	0	1	2	3	4
8	Você tem achado que não conseguiria lidar com todas as coisas que você tem que fazer?	0	1	2	3	4
9	Você tem conseguido controlar as irritações em sua vida?	0	1	2	3	4
10	Você tem sentido que as coisas estão sob o seu controle?	0	1	2	3	4
11	Você tem ficado irritado porque as coisas que acontecem estão fora do seu controle?	0	1	2	3	4
12	Você tem se encontrado pensando sobre as coisas que deve fazer?	0	1	2	3	4
13	Você tem conseguido controlar a maneira como gasta seu tempo?	0	1	2	3	4
14	Você tem sentido que as dificuldades se acumulam a ponto de você acreditar que não pode superá-las?	0	1	2	3	4

Figure 1. Perceived Stress Scale (Brazilian version)[20]. Reproduction authorized by the main author.

exploratory cohort study entitled *"Microbial burden, pain, inflammation, stress and delayed wound healing: Cohort Study"*[15], whose objective was to identify and analyze the relationships between microbial burden, inflammation, pain, and healing of acute and chronic wounds, as well as the relationship between wound healing and the stress experienced by individuals affected. The primary study employed a longitudinal study methodology for risk determination[23]. The present manuscript, which presents a case series, followed the Case Report Guidelines (CARE)[24].

Study setting

The primary study was conducted in a specialized care unit for patients with wounds, ostomies, and urinary dysfunctions, in both inpatient and outpatient settings, at a healthcare institution in the city of São Paulo. Patients received support from a multidisciplinary team composed of 16 professionals. When necessary, they could be referred for care to psychiatric and psychological services; however, access was limited due to the low number of available professionals and long waiting lists for appointments.

Population and sample

The population of the primary study consisted of all adult individuals with hard-to-heal wounds who were receiving outpatient follow-up by the Enterostomal Therapy team. A convenience sample was used, comprising 41 patients who

met the inclusion criteria: being 18 years of age or older, having a wound lasting more than four weeks, and being able to complete the questionnaires. The exclusion criteria were: failure to attend at least two follow-up appointments and more than 50% data loss. As for the sample of this secondary study, it included one patient for each wound etiology: arterial vascular ulcer, venous ulcer, mixed vascular ulcer, microvascular disease-related ulcer in a patient with diabetes, pressure injury, traumatic injury, malignant neoplastic wound, amputation wound, infectious wound, and lower limb ulcer due to rheumatic disease, .totaling ten patients.

Data collection procedures

In the primary study, potential participants were identified by specialized nurses during their routine activities and were approached to verify eligibility criteria. If eligible, they were invited to participate in the study by the researchers, who accompanied the outpatient clinic professionals during the appointments. Once identified, the researchers approached them and explained the study's objectives, characteristics, and procedures, as well as the participants' rights. Those who expressed interest in participating were instructed to read and sign the Informed Consent Form.

Subsequently, the researchers collected data in person and individually, in a private room, through interviews, physical examination with wound assessments, and analysis of medical records. Given the observational and exploratory nature of the study, data collection was carried out without interfering with the wound treatment, which was defined and carried out by the healthcare professionals responsible for patient care at the institution. Patients were evaluated during at least two appointments, with intervals ranging from seven to 30 days, depending on individual needs and the clinic's scheduling availability.

Data collection instruments

Specific instruments were used, integrated into the REDCap®[25] electronic data capture system, hosted at the Hospital das Clínicas,University of São Paulo. During data collection, all information was digitally stored with exclusive access granted to the researchers. The instruments are described below:

- Sociodemographic and Clinical Data Form:

Developed by the researchers, this form included the following: date of birth, sex, self-reported skin color or race[26], educational level, marital status, religious affiliation, family income, and current occupation. It also addressed clinical history of comorbidities, hospitalization in an intensive care unit or ward within the last 12 months, wound type, wound duration, wound location, frequency of dressing changes, and Body Mass Index (BMI — kg/m^2).

- Brief Pain Inventory — BPI:

This instrument was developed by Cleeland et al.[27] and validated for Brazilian Portuguese by Ferreira et al.[28]. In its application, participants were asked to rate their pain intensity at the time of the interview, the worst and least pain in the past 24 hours, and the average pain during the same period. These responses generated the pain sensitivity score (BPIS). Participants were also asked to report how pain interfered with their mood and daily activities (such as walking, working, social activities, relationships with others, and sleep). These responses formed the pain interference score (BPII). The instrument uses a scoring scale from 0 to 10. The average of these ratings was used as the final score.

- Bates-Jensen Wound Assessment Tool — BWAT*:*

A wound assessment tool developed by Bates-Jensen e Sussman,[29] and adapted and validated for Brazilian Portuguese by Alves et al.[30]. The instrument evaluates the severity of the wound through size, depth, edges, undermining, type and amount of necrotic tissue, type and amount of exudate, color of the surrounding skin, peripheral tissue edema and induration, granulation tissue, and epithelialization. The total score ranges from 13 to 65, with higher scores indicating more severe wound degeneration.

- Perceived Stress Scale — PSS:

Patients completed to the PSS in its version adapted and validated for Brazilian Portuguese[20]. Both the original article and the validation study support its application through self-administration or interview, as done in this study. The scale contains 14 items that assess how unpredictable, uncontrollable, and overloaded the respondent perceives their life to be. Response options range from 0 to 4 (0=never; 1=almost never; 2=sometimes; 3=fairly often; 4=very often); seven questions address negative perceptions (1, 2, 3, 8, 11, 12, and 14), and seven address positive perceptions (4, 5, 6, 7, 9, 10, and 13). The scores from the negative items are summed, and the positive items are reverse-coded (0=4, 1=3, 2=2, 3=1, and 4=0) and then summed with the others, resulting in a total score ranging from 0 to 56 points; the higher the score, the greater the perceived stress.

To calculate perceived distress and coping[31], only the negative and only the positive items, respectively, were summed, without applying reversing scoring. This resulted in a score ranging from 0 to 28 points for each of the two factors[31]. To categorize stress according to percentiles, the following cut-off points were used: 25th percentile; ≤18 (low), 50th percentile; 19–24 (normal), 75th percentile; 25–29 (moderate), 90th percentile; 30–35 (high), and 95th percentile; >35 (very high)[32].

Ethical procedures

In compliance with Resolution 466/2012 of the Brazilian National Health Council, the original project was submitted to and approved by the Research Ethics Committee of the School of Nursing at the University of São Paulo (CEP-EEUSP), with authorization from the co-participating healthcare institution, through registration in Plataforma Brasil (protocols no. 5.189.744 and 5.114.796, both from 2021). The secondary data analysis presented in this article was also submitted to and approved by CEP-EEUSP, under opinion number 6.544.353, issued in 2023.

By participating in this study, the patient benefited from a more comprehensive assessment of their health status, stress level, and wound, as the information obtained was promptly shared with the responsible healthcare professional at the institution. This allowed for treatment optimization or early warning of potential risks, and the data were also recorded in the patient's medical chart.

Identifying variables, such as names and other forms of personal identification, were removed from the databases and replaced with codes for use in publications and, if applicable, for sharing the database with other researchers.

Statistical analysis

The data obtained were analyzed using descriptive statistics with Jamovi software[33]. Measures of central tendency (mean, median, and mode) and measures of distribution (quartiles and percentages) were reported. No association analyses were performed due to the small sample size.

RESULTS

In the sociodemographic characterization (Table 1), the ten patients included were between 32 and 75 years old. Most were female, self-identified as Black, had technical education as their highest educational level, and were retired. Half of the patients reported being in a stable relationship, and the majority practiced a religion.

Regarding clinical data (Table 1), all patients presented with at least one comorbidity, ranging from one to six per patient. Six patients had not been hospitalized in the previous 12 months, and seven had wounds located on the lower limbs. Wound duration ranged from two to 73 months. Finally, BMI values ranged from a minimum of 21.5 to a maximum of 38.6 kg/m^2.

The mean total BWAT score was 21.2 (standard deviation — [SD] 5.5), with a mean of 23.7 (SD 7.2) at baseline and 19.4 (SD 5.4) at the last appointment, showing a reduction of 4.3 points.

Table 1. Sociodemographic and clinical profile of the sample (n=10), São Paulo, Brazil, 2022–2023.

Quantitative variable	Mean	Standard deviation	Median	Missing data n (%)
Age (years)	58	15.5	64.5	0 (0)
Family income (BRL)	6,043	2,499	6,500	3 (30)
Number of comorbidities (n)	3.3	1.9	3	0 (0)
Wound duration (months)	21.2	26.3	7	0 (0)
Body Mass Index (kg/m²)	27.7	5.9	24.6	3 (30)
Categorical variable	**Category**	**Frequency (n)**	**Percentage (%)**	**Missing data n (%)**
Sex	Female	6	60	0 (0)
	Male	4	40	
Skin color or race	White	3	30	0 (0)
	Asian	1	10	
	Mixed race	2	20	
	Black	4	40	
Educational level	Technical education	3	30	0 (0)
	Incomplete high school	2	20	
	Complete high school	2	20	
	Incomplete higher education	2	20	
	Complete higher education	1	10	
Marital status	Married or in a stable union	5	50	0 (0)
	Single, widowed, or divorced	5	50	
Prática de religião	Yes	7	70	0 (0)
	No	3	30	
Current occupation	Retired	4	40	0 (0)
	On medical leave	2	20	
	Permanently removed from work	1	10	
	Employed worker	2	20	
	Self-employed worker	1	10	
Comorbidity	Yes	10	100	0 (0)
	No	0	0	
Hspitalization in the past 12 months	Yes	4	40	0 (0)
	No	6	60	
Wound location	Lower limb	7	70	0 (0)
	Trochanter	1	10	
	Chest region	1	10	
	Neck	1	10	
Dressing frequency	Every 24 hours	7	70	0 (0)
	Every 48 hours	3	30	

Regarding pain, the mean scores were 3.8 (SD 2.6) and 3.7 (SD 3.5) for BPIS and BPII, respectively. At baseline, the scores were 4.0 (SD 2.9) and 3.2 (SD 3.2), respectively, and at the final appointments, 3.2 (SD 2.2) and 3.9 (SD 4.5), respectively. BPIS decreased by 0.8, while BPII increased by 0.7.

In the analysis of PSS data, the overall mean score was 23.2 (SD 12.8), with a baseline mean of 28.5 (SD 14.0) and a final mean of 20.9 (SD 10.0) reflecting a decrease of 7.6 points. When classifying perceived stress levels across all appointments

(n=36), it was observed that in 15 (41.7%) consultations patients exhibited low stress; in six (16.7%), normal stress; in five (13.9%), moderate stress; in three (8.3%), high stress; and in seven (19.4%), very high stress. Comparing results by patient, at the initial consultation, six patients exhibited moderate, high, or very high levels of stress, while four presented low or normal levels. By the final consultations, the number of patients with moderate, high, or very high stress had decreased to three, and those with low or normal levels had increased to seven. Figure 2[32] graphically presents the number of patients by stress level at the first and final consultations.

The mean perceived distress score among patients was 13.2 (SD 7.4); 16.4 (SD 7.2) at the baseline and 11.1 (SD 6.2) at the final appointments, indicating a reduction of 5.3 points. Regarding perceived coping, the overall score was 18 (SD 6.5), with 16 (SD 7.9) at baseline and 18.2 (SD 5.5) at the final appointments, reflecting an increase of 2.2 points (Table 2).

To better visualize each of the ten patients included in this clinical case series, Table 3 presents their sociodemographic and clinical profiles, along with outcomes related to pain (BPIS and BPII), wound healing (BWAT), and perceived stress (PSS).

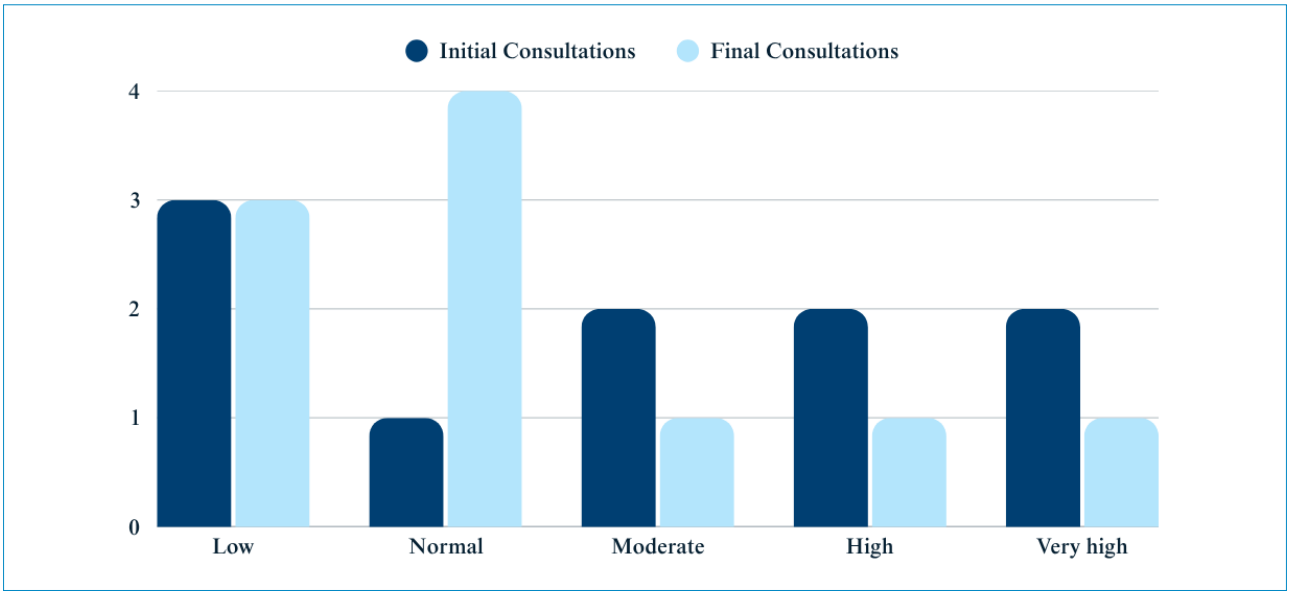


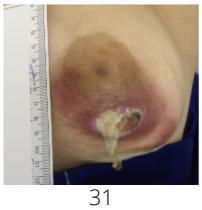
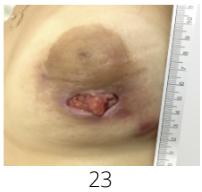
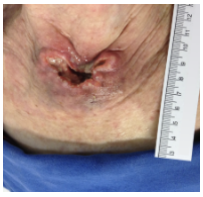
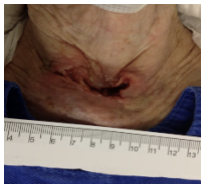
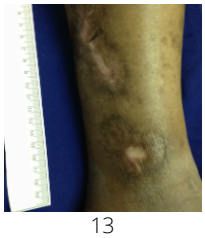
Figure 2. Patient stress categorization by percentiles[32].

Table 2. Two-factor model outcomes of the Perceived Stress Scale – Distress and Coping. São Paulo, 2022–2023.

Nº	Baseline PSS	Distress score	Coping score	Final PSS	Distress score	Coping score	Stress outcome increased/ decreased	Distress outcome increased/ decreased	Coping outcome increased/ decreased
1	24	17	21	16	9	21	decreased	decreased	no change
2	31	17	14	23	12	17	decreased	decreased	increased
3	27	11	12	23	9	14	decreased	decreased	increased
4	11.8	9	25.7	9	7	26	decreased	decreased	increased
5	18	9	19	22	8	14	increased	decreased	decreased
6	14	8	22	28	20	20	increased	increased	no change
7	46	24	6	2	0	26	decreased	decreased	increased
8	26	20	22	30	17	15	increased	decreased	decreased
9	53	27	2	36	17	9	decreased	decreased	increased
10	34	22	16	20	12	20	decreased	decreased	increased

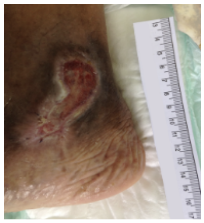
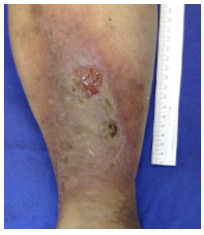
PSS: Perceived Stress Scale.

Table 3. Sociodemographic and clinical data, as well as outcomes related to pain, wound healing, and stress in patients with hard-to-heal wounds, including photographic documentation of different wound types (n=10). São Paulo, Brazil, 2022–2023.

Nº	Age, sex, marital status, no. of comorbidities, wound etiology, wound duration, number of consultations	BPIS initial/ final	BPII initial/ final	BWAT initial/final	Healing outcome improved/ worsened	initial/final PSS initial/final classification	Stress outcome decreased/ increased
1	38, female, married, 4 comorbidities, amputation wound, 6 months, 5 consultations	0.0/2.5	missing data/0.7	 18  11	improved	24/16 normal/low	decreased
2	67, male, married, 2 comorbidities, mixed leg ulcer, 3 months, 4 consultations	3.8/3.7	3.7/0.6	 26  24	improved	31/23 high/normal	decreased
3	32, female, married, 2 comorbidities, infectious wound, 2 months, 2 consultations	6.5/4.0	5.7/ missing data	 31  23	improved	27/23 moderate/ normal	decreased
4	69, male, married, 1 comorbidity, traumatic injury, 60 months, 4 consultations	0.0/0.0	0.0/0.0	 18  20	worsened	11.8/9 low/low	decreased
5	75, female, widowed, 3 comorbidities, malignant neoplastic wound, 5 months, 4 consultations	6.0/4.0	0.7/1.8	 26  18	improved	18/22 low/normal	increased
6	72, female, divorced, 3 comorbidities, arterial vascular ulcer, 8 months, 4 consultations	7.3/7.5	6.9/10.0	 13  13	no change	14/28 low/moderate	increased

Continue...

Table 3. Continuation.

Nº	Age, sex, marital status, no. of comorbidities, wound etiology, wound duration, number of consultations	BPIS initial/ final	BPII initial/ final	BWAT initial/final	Healing outcome improved/ worsened	initial/final PSS initial/final classification	Stress outcome decreased/ increased
7	64, female, widowed, 6 comorbidities, venous ulcer, 37 months, 6 consultations	7.0/3.5	8.0/9.9	 23  22	improved	46/2 very high/low	decreased
8	40, female, stable union, 5 comorbidities, lower limb ulcer due to rheumatic disease, 16 months, 3 consultations	3.5/2.8	2.6/5.3	 19  19	no change	26/30 moderate/ high	increased
9	58, male, single, 6 comorbidities, microvascular disease-related ulcer in a patient with diabetes, 2 months, 2 consultations	missing data	missing data	 25  15	improved	53/36 very high/very high	decreased
10	65, male, divorced, 1 comorbidity, pressure injury, 73 months, 5 consultations	2.0/0.5	0.6/0.0	 38  19	improved	34/20 high/normal	decreased

BPIS: Brief Pain Inventory – Sensitivity; BPII: Brief Pain Inventory – Interference; BWAT: Bates-Jensen Wound Assessment Tool; PSS: Perceived Stress Scale.

DISCUSSION

In the field of chronic diseases, the influence of psychosocial factors on the progression of clinical treatment has been increasingly studied. Among individuals with wounds, although publications on the subject remain limited, emotional and biological stress is a factor influencing delayed wound healing[34]. Accordingly, the present study aimed to illustrate the assessment of stress, distress, and perceived coping among patients with hard-to-heal wounds treated at an Enterostomal Therapy outpatient clinic.

In this case series, a trend was observed suggesting a potential relationship between stress and wound healing, as both PSS and BWAT scores decreased in 6 out of 10 patients. In other words, as the wound healing progressed, stress levels also

decreased in most patients. This observation was reinforced by the fact that the two patients who showed no improvement in wound healing also exhibited a marked increase in stress levels. However, wound healing is a complex phenomenon not solely determined by psychosocial factors[9], and the small sample size did not allow for statistical confirmation of this observation.

According to the PSS two-factor model (distress and coping), distress levels decreased in all seven patients who showed improvement in wound healing, while coping increased in five of them. Furthermore, the changes in distress scores were more pronounced than those observed in coping scores. The substantial reduction in distress has resulted from positive outcomes in the healing process, enabling patients to experience a meaningful reduction in daily stressors, such as pain sensitivity, factor commonly linked to elevated levels of perceived stress[35].

Deschodt et al.[36] conducted a review of systematic reviews and identified statistically significant effects of nursing consultations on quality of life outcomes, health behaviors, medication adherence, mortality, and patient satisfaction. In the present study, no specific interventions were applied to enhance coping levels; however, it is hypothesized that the increase in perceived coping during treatment may be associated with the empathetic relationship established with the nursing team, and the patients' perception of being cared for during conversations held at each appointment.

Moreover, administering the PSS instrument may have encouraged patients to express and reflect on their life as unpredictable, uncontrollable, and overwhelming[20].

In this regard, it is worth noting that among the seven patients who showed improvement in wound healing, six also experienced a stress reduction. The only patient who had increased stress despite wound healing also exhibited a decrease in coping. In this case, the rise in stress appears to be linked to the drop in effective coping mechanisms. Conversely, the only patient who experienced stress reduction despite worsened wound healing demonstrated an increase in coping. Among the three patients who reported increased stress, two had decreased coping scores, and one showed no change.

Given that coping has been associated with better adaptation, reduced psychological distress, protection against depression, and improved quality of life[37], future studies should go beyond merely describing stress and its progression but also implement interventions for developing coping skills in patients with wounds. Such interventions may include relaxation techniques, problem-focused coping, seeking social support, and psychotherapy[38].

A prospective, longitudinal, observational study lasting eight weeks and involving 74 participants was conducted to investigate the association between symptoms of fatigue, pain, and wound healing[39]. Pain was found to decrease during treatment, and although no direct influence on wound healing was confirmed, pain impairs mobility and proper daily functioning. Thus, as healing progresses, a reduction in this symptom is expected to improve. In our study, there was a decrease in average pain sensitivity, but an increase in pain interference. This outcome was interpreted because, although seven patients showed improvement in wound healing, their wounds had not completely healed by the end of the data collection period.

Historically, healthcare has been grounded in a biomedical model characterized by fragmented roles and services, with a focus on the biological dimension of the human being and the notion of health as the absence of disease. In Brazil, the Health Reform and Psychiatric Reform movements brought forth the biopsychosocial model[40], which highlighted the importance of multidisciplinary approaches and service integration to consider the individual as a whole[41]. Winyk et al.[42], in a case report, emphasized the importance of multidisciplinary care for patients with chronic wounds.

Based on the findings from this case series of ten patients, the role of the enterostomal therapy nurse appears to be promising, both in psychosocial screening and in performing brief interventions during wound care. These actions are supported by the literature[41-43] and reinforced by training with the multidisciplinary team. Such screening should aim to identify patients with high levels of distress and low coping capacity, who may benefit from specialized psychological care provided by hospital psychology services.

For example, a descriptive study developed a multidisciplinary care protocol for people with complex wounds in primary healthcare.

The psychosocial interventions included in the protocol were:

1. An educational booklet;
2. A checklist to be applied in the dressing room;
3. Waiting room activities;
4. Matrix support (multidisciplinary meetings for case discussions and/or thematic discussions).

The checklist investigates aspects such as treatment adherence, self-care, autonomy, support networks, and relationships, which are used to support referrals to other professionals and/or case discussions during matrix support meetings[43].

Based on these results, there is a recognized need for multidisciplinary work in outpatient and clinical settings involving people with complex and hard-to-heal wounds. The support provided by nursing teams contributes to identify patient needs and resolve issues in collaboration with the broader health care team. In this way, the hospital psychologist may identify psychological needs and offer emotional support for the patient, their family, and the healthcare team[44].

Limitations

Among the limitations, the observational methodological design (without interventions) should be highlighted, as it does not permit the establishment of a cause-and-effect relationship between the application of the PSS and the clinical outcomes in the wound healing process. Moreover, the potential influence of the researcher as an observer on clinical outcomes cannot be excluded. The small patient sample did not allow for the performance of statistical association analyses.

Recommendations

Nevertheless, the study offers promising contributions to both Psychology and Nursing. In the field of Psychology, the description of the PSS, the comparison of scores between consultations, and the discussion of distress and coping are noteworthy. In Nursing, the study underscores the importance of early screening of psychosocial factors influencing wound healing and the potential for collaborative work with Psychology. Thus, it is hoped that future studies will be conducted with larger samples and the use of control to evaluate the effectiveness of interventions.

CONCLUSION

Following the assessment of perceived stress and wound healing in this case series of ten patients , a trend suggesting an association between the two was observed , with coping emerging as a significant factor influencing the patient's perception of stress. The findings indicate that the assessment of perceived stress in patients with hard-to-heal wounds remains an unmet need, highlighting the importance of collaborative efforts among professionals and researchers from different fields to address this gap.

A multiprofessional approach is essential, with emphasis on the potential role of the enterostomal therapy nurse in screening and initiating early interventions for perceived distress and coping, as well as in identifying the need for referral to hospital psychology and/or psychiatry services .

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Conflicts of interest: VLCGS and CVSG are speakers for the company Essity. BY is the owner of Enfmedic and ByCorpus. BCF has worked as a consultant for Coloplast.

Ethics committee approval: The secondary study was approved by the Research Ethics Committee of the School of Nursing at the University of São Paulo, opinion no. 6.544.353/2023, *Certificado de Apresentação para Apreciação Ética (CAAE)* 75312123.5.0000.5392. The same committee approved the primary study, no. 5.114.796/2021, CAAE 52281021.9.0000.5392, and by the Research Ethics Committee of the Hospital do Servidor Público Estadual de São Paulo, opinion no. 5.189.744/2021, CAAE 52281021.9.3001.5463.

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