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Patient symptom experience in chronic wounds: A descriptive cross-sectional study

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Abstract

Concomitant with the rising prevalence of chronic wounds, it is imperative for patients to assess their own symptoms throughout the treatment process. Therefore, this study was undertaken to ascertain the symptom experiences of patients with chronic wounds. The present study was conducted descriptively with a cohort of 64 patients who were under observation in the chronic wound care unit of a training and research hospital. Data were collected using two instruments: the "Patient Characteristics Form" and the "Toronto Symptom Assessment System for Wounds (TSAS-W)". Descriptive statistics, comparison analysis and hierarchical linear regression were used in the analysis. A statistically significant difference was identified between the mean TSAS-W scores according to wound localization and wound class ($F=2.795$, $p=0.034$; $F=6.677$, $p=0.000$). Furthermore, the mean total score on the TSAS-W for the patient population was 34.82 ± 17.64 . The explanatory power of wound characteristics (wound classification $\beta=4.295$; $p=0.009$; wound area $\beta=0.217$; $p=0.014$) for patients' symptom experience was found to be 13.4% ($R^2=0.134$; $p=0.039$). While the general symptom experiences of patients receiving chronic wound care were found to be low. Wound classification and wound area were significant factors that affected patients' experience of symptoms.

Keywords: Patient, symptom assessment, wounds

Introduction

The development of chronic wounds is characterized by prolonged healing processes due to underlying etiologies. This condition affects an estimated 6-8 million individuals globally [1,2]. The prevalence of chronic wounds is increasing concomitantly with the rise in the number of individuals affected by diabetes and obesity [1]. It has been documented that among the 30 million individuals diagnosed with diabetes in the United States, 1 million experience the development of diabetic foot ulcers on an annual basis, with acute wounds progressing to chronic wounds [3]. Chronic wounds are defined as such due to complications from venous insufficiency, diabetes, and pressure ulcers, and they most often affect adults [4]. Chronic wounds are characterized by prolonged inflammation and healing, often accompanied by exudate and odor. These wounds are also susceptible to injury and may progress to sepsis [3,5]. Individuals afflicted with chronic wounds often manifest a range of psychosocial challenges, including anxiety, depression, social isolation, and a sense of shame [6]. A study of chronic wounds revealed that patients'

quality of life was predominantly impacted by factors related to mobility, self-care, pain/discomfort, and anxiety/depression [7].

The treatment of chronic wounds is a multifaceted process that necessitates a collaborative approach by a multidisciplinary team of healthcare professionals. Therefore, effective diagnosis, treatment, and management of wounds necessitate patients to accurately and comprehensively describe their symptoms [1,8]. Wound assessment is a critical component of chronic wound monitoring. In cases of chronic wounds, symptoms such as wound size, odor, infection, and pain can have a profound impact on patients' daily activities and social lives. However, conventional treatment protocols tend to prioritize objective measurements, including duration and area, while often neglecting to consider the patient's perspective. Objective measures are inadequate for comprehensively assessing patient experience of care [9].

In the domain of wound care, systematic documentation of the patient's condition and the characteristics of the wound is paramount [10]. In the extant literature, the utilization of structured questionnaires has been a recurrent phenomenon in the

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evaluation of chronic wounds. These questionnaires are employed to assess a myriad of variables, including the wound's class, location, the utilized product for wound care, and the presence of surgical intervention [7,11]. In this context, considering that chronic wounds affect patients multidimensionally—physically, psychologically, and socially—the assessment of wound symptoms using valid and reliable instruments not only facilitates monitoring of the healing process but also supports the inclusion of patients' symptom experiences in the care process. Accurate and comprehensive wound assessment should not be limited to clinicians' observations alone; it should also incorporate qualitative measures that reflect how patients experience the symptoms. Therefore, the objective of this study was to ascertain the perceptions experiences of symptoms from the viewpoint of patients receiving chronic wound care. Determining patients' symptom experiences of their wounds will provide clinicians with a multidimensional perspective by ensuring that the patient's experience is reflected in the care provided during the wound follow-up process. In this direction, the present study sought to answer the following questions:

1. What is the level of symptom experience of patients with chronic wounds?
2. Is there a difference between sociodemographic characteristics and wound symptom experience of patients with chronic wounds?

Material and Methods

Type of Study

This is a descriptive cross-sectional study.

Population and Sample of the Study

The study was conducted with patients admitted to the chronic wound care clinic of a public teaching and research hospital between January and June 2024. All patients who presented to the clinic were invited to participate in the study, with no sampling. The data were collected by the researcher in about 10 minutes in a face-to-face interview before the patients started treatment. The inclusion criteria for the study were defined as follows: (1) individuals aged 18 years or older with a chronic wound, (2) those capable of expressing themselves and engage in verbal communication, and (3) those capable of assessing their own wound. The exclusion criterion was defined as patients who did not consent to participate in the study. Wound size was measured using a disposable wound ruler. Wound size was calculated as the surface area in square centimeters (cm²). The study was completed with 64 patients. The post hoc power analysis conducted using G*Power 3.9.1.7 indicated an effect size of $t = 2.73$ and a statistical power ($1-\beta$) of 0.95, demonstrating that the sample was statistically adequate.

Data Collection Tools

The Patient Information Form and the Toronto Symptom Assessment System for Wound (TSAS-W) form were used for data collection.

Patient Information form

The form developed by the researcher based on the literature [9,10] includes questions about socio-demographic and wound status such as age, gender, educational status, chronic disease status, body mass index (BMI), wound duration, frequency of wound care.

Toronto Symptom Assessment System for Wound (TSAS-W)

The scale was developed by Maida et al (2009) to identify symptoms associated with wounds [12]. The TSAS-W is a 10 question instrument and each question has a total of 11 points ranging from 0-10. For each question, 0 indicates that the symptom is not experienced and 10 indicates that the symptom is very intense. It is considered that the higher the score, the more symptoms are experienced by the patient. The Turkish adaptation study was conducted by Şahin Köze and Özbayır (2013). In the relevant study, the internal consistency coefficient was not reported, as the questions were assumed to have a single correct answer and to carry the same meaning for all participants [10]. However, in the present study, the internal consistency of the TSAS-W was evaluated, and the Cronbach's alpha coefficient was found to be 0.75. This value indicates that the scale has an acceptable level of internal consistency.

Statistical Analysis

Statistical Package for Social Sciences 22.0 (SPSS, IBM Corp., Armonk, NY, USA) for Windows was used for statistical analysis. Descriptive data are presented as counts, percentages, means, medians, and standard deviations. Normality distribution of continuous variables was performed using the ± 2 skewness and kurtosis values recommended by George and Mallery (2010) [13]. Independent groups t-test and one-way analysis of variance were used to compare variables. Bonferroni post hoc analysis was used to detect differences between groups. And linear hierarchical regression analysis was performed to evaluate the effects on the dependent variable TSAS-W. Statistical significance was accepted at the level of $p < 0.05$.

Ethics Committee Approval

Approval from the Scientific Research Ethics Committee of Şırnak University (number: 2023/78050 date: 10/17/23) and permission from Gazi Yaşargil Training and Research Hospital (number: E-581146266-000-228408624) were obtained before the study began. The study adhered to the tenets of the Declaration of Helsinki, and participants were informed of the confidentiality of their data. Accordingly, verbal and written informed consent was obtained.

Result

In this section, the results of 64 patients who participated in the study were evaluated.

According to the demographic characteristics of the patients:

70.3% were male, 59.4% had primary education, 90.8% had a perceived income level of moderate or poor, 67.2% were non-smokers, 54.7% were on a diet, 75% were diagnosed with diabetes mellitus (DM) and 60.3% with hypertension (HT). The mean age of the patients was 60.78 ± 14.40 years and the BMI was 26.74 ± 4.75 . There was no statistically significant difference between the mean TSAS-W scores and gender, educational status, smoking, dietary status, presence of DM and HT diagnosis ($p > 0.05$). It was observed that there was a difference ($p < 0.024$) only between the perceived income status and the mean TSAS-W scores of the patients. According to the Bonferroni test result of the post hoc pairwise comparisons performed to reveal the group that made the difference, the mean scores of those with good perceived income status were found to be lower than those with moderate and poor income status (Table 1).

It was found that 57.8% of patients had a wound duration of 2-12 months, 73.4% dressed their wounds once a day, 50% of patients had previously undergone surgery, 42.2% of patients had wounds localized to the lower extremities and 29.7% to the foot, 57.8% had diabetic foot ulcers (DFU) and 20.3% had pressure ulcers. The mean wound surface area was 30.87 ± 27.25 cm². There was no statistically significant difference between mean TSAS-W scores and wound duration, frequency of dressing changes, wound

related hospitalizations, and wound surgical procedures ($p > 0.05$). There was a statistically significant difference between the patients' mean TSAS-W scores according to wound location ($F = 2.795$, $p = .034$). According to the Bonferroni test to find the group that made a difference, the mean score of the patients with heel wound localization was higher than the lower extremity localization group. Furthermore, a statistically significant discrepancy was observed between the wound classification of the patients and the mean TSAS-W score ($F = 6.677$, $p = 0.000$). According to the Bonferroni analysis, which was conducted to identify the group that exhibited a significant difference, the mean scores of the venous ulcer and infection wound group were higher than those of the DFU group (Table 2).

The total TSAS-W score of the patients was 34.82 ± 17.64 . An examination of the mean scores of the patients for wound symptoms revealed the following results: aesthetic distress in wound appearance (8.53 ± 2.17), discharge/leakage (4.59 ± 3.65), edema around the wound (4.20 ± 3.75), and pain during dressing/wound cleaning (4.10 ± 3.00). The mean score for the presence of odor within the wound was 3.62 ± 4.01 , while the mean for pain during dressing or wound cleaning was 3.37 ± 3.53 . Additional mean scores were documented for symptoms including heaviness in the dressing (2.28 ± 2.68), heaviness in the wound area (2.15 ± 3.08), bleeding (1.51 ± 2.71), and itching (0.43 ± 1.25) (Table 3).

Table 1. Distribution of demographic characteristics of patients and comparison of mean TSAS-W scores (N=64)

Variables	n	%	$\bar{X} \pm SD$	Test and p value
Gender				
Male	45	70.3	34.24 ± 18.19	$t = 0.404$
Female	19	29.7	36.21 ± 16.66	$p = 0.687$
Education level				
Illiterate	16	25	32.50 ± 15.36	$F = 0.222$
Primary school	38	59.4	35.36 ± 18.13	$p = 0.881$
Secondary school	8	12.5	35.00 ± 21.97	
University	2	3.1	42.50 ± 17.67	
Perceived income level				
Good 1	6	9.4	16.50 ± 10.48	$F = 3.947$
Moderate 2	29	45.3	37.37 ± 16.61	$p = 0.024$
Poor 3	29	45.3	36.06 ± 18.02	$2 > 1^* \quad 3 > 1^*$
Smoking status				
Yes	21	32.8	35.57 ± 19.06	$t = 0.234$
No	43	67.2	34.46 ± 17.13	$p = 0.816$
Status of being on a diet				
Yes	35	54.7	35.91 ± 17.09	$t = 0.538$
No	26	45.3	33.51 ± 18.50	$p = 0.593$
Presence of diabetes				
Yes	48	75	32.68 ± 17.04	$t = -1.706$
No	16	25	41.25 ± 18.42	$p = 0.093$
Presence of hypertension				
Yes	39	60.3	35.94 ± 19.11	$t = .631$
No	25	39.1	33.08 ± 15.29	$p = 0.530$
	$\bar{X} \pm SD$		Min	Max
Age (years)	60.78 ± 14.40		23	91
BMI	26.74 ± 4.75		17.40	40.10

TSAS-W: Toronto Symptom Assessment System for Wound, BMI: Body Mass Index, t: Independent groups t test, F: one-way analysis of variance (ANOVA), *: Post hoc comparison Bonferroni test $p < 0.05$ statistical significance

Table 2. Distribution of patients' wound characteristics and comparison of mean TSAS-W scores (n=64)

Variables	n	%	$\bar{X} \pm SD$	Test and p value
Wound duration				
2-12 months	37	57.8	33.10±15.69	F=0.240 p=0.867
13-18 months	8	12.5	35.12±16.88	
19-24 months	7	10.9	37.14±17.64	
25 ay ≥	12	18.8	38.58±24.45	
Wound care frequency				
Once a day	47	73.4	36.08±18.10	F=0.501 p=0.608
Several times a day	6	9.4	29.33±13.85	
Every other day	11	17.2	32.45±18.09	
Previous hospitalization				
Yes	37	57.8	36.29±19.31	t=0.777 p=0.440
No	27	42.2	32.81±15.19	
Previous surgical intervention on the wound				
Yes	32	50	39.06±19.88	t=1.962 p=0.055
No	32	50	30.59±14.15	
Localization of the wound				
Heel 1	3	4.7	63.00±18.33	F=2.795 p=0.034 1>3*
Upper extremity 2	2	3.1	49.00±1.41	
Lower extremity 3	27	42.2	31.40±17.95	
Sacrum/ coccyx 4	13	20.3	35.00±15.13	
Foot (except heel) 5	19	29.7	33.63±16.14	
Wound Class				
Pressure sore 1	13	20.3	35.00±15.13	F=6.677 p=0.000 4>3* 5>3*
Traumatic 2	6	9.4	42.66±10.03	
Diabetic foot ulcer 3	37	57.8	28.56±16.22	
Venous ulcer 4	5	7.8	54.40±5.12	
Infection (Osteomyelitis)5	3	4.7	63.00±18.33	
	$\bar{X} \pm SD$		Min	Max
Wound surface area (cm²)	30.87±27.25		6	110

t: Independent group t test, F: one-way analysis of variance (ANOVA), *Post hoc comparison Bonferroni test, p<0.05 statistical significance

Table 3. Distribution of mean wound symptom assessment scores of patients (n=64)

Symptom	$\bar{X} \pm SD$	Min	Max
Pain (during dressing/wound cleaning)	4.10 $\pm$ 3.51	0	10
Pain (between dressing/wound cleaning)	3.37 $\pm$ 3.53	0	10
Discharge / leakage	4.59 $\pm$ 3.65	0	10
Odor	3.62 $\pm$ 4.01	0	10
Itching	0.43 $\pm$ 1.25	0	6
Bleeding	1.51 $\pm$ 2.71	0	9
Aesthetic distress (wound appearance)	8.53 $\pm$ 2.17	2	10
Edema (around the wound)	4.20 $\pm$ 3.75	0	10
Feeling of heaviness (in the wound area)	2.15 $\pm$ 3.08	0	10
Feeling of heaviness (in dressing)	2.28 $\pm$ 2.68	0	10
TSAS-W total score	34.82 $\pm$ 17.64	3	83

TSAS-W: Toronto symptom assessment system for wounds

A hierarchical linear regression analysis was conducted to determine the effects of various variables on patients' experience of wound-related symptoms. In Model 1, gender, age, and BMI explained 2% of the total variance in the dependent variable; however, this was not statistically significant ($R^2=0.024$; $p=0.221$). In contrast, the addition of wound characteristics in

Model 2 increased the explained variance to 13%, which was statistically significant ($R^2=0.134$; $p=0.039$). Among the variables included, wound duration, frequency of wound care, and wound location were not significant predictors ($p>0.05$), whereas wound classification ($\beta=4.295$; $p=0.009$) and wound area ($\beta=0.217$; $p=0.014$) were identified as significant predictors.

Table 4. Hierarchical linear regression analysis of TSAS-W score

Model	Independent Variable	β	Standard Error	Beta	t	p	VIF	F	Model (p)	R²
1	(p)	52.856	20.490		2.580	0.12				
	Sex	-4.163	5.115	-.109	-.814	0.419	1.149	1.511	.221	.024
	Age	-.321	.160	-.262	-2.009	0.049	1.100			
	BMI	.321	.476	.086	.674	0.503	1.063			
	Constant	9.134	23.350		.391	0.697				
2	Sex	-2.946	5.048	-.077	-.584	0.562	1.262	2.222	0.039	.134
	Age	-.163	.162	-.133	-1.004	0.320	1.280			
	BMI	.406	.483	.109	.840	0.404	1.232			
	Wound duration	1.563	1.774	.107	.881	0.382	1.067			
	Frequency of wound care	-2.493	2.984	-.109	-.836	0.407	1.246			
	Wound location	-.109	-.836	0.407	.761	0.450	1.290			
	Wound classification	1.246	1.585	.357	2.709	0.009	1.265			
	Wound area	.217	.085	.335	2.549	0.014	1.258			

Dependent variable: Toronto symptom assessment system for wounds (TSAS-W)

Discussion

The study supports its primary objective by revealing that patients demonstrated a limited level of awareness regarding their symptom experiences related to chronic wounds. However, the patients indicated that they were most disturbed by the aesthetic appearance of the wounds, discharge, edema, pain, and odor. The study's findings revealed that the majority of the patients were male, had received a primary education, had a medium-poor income level, had an average age, and were overweight. The determination was made that the patients had either DM or HT, and the majority of them were on a diet. Erkin et al. (2022) evaluated patients with chronic wounds and obtained similar results to our findings in terms of male gender, education level, BMI, and presence of comorbidities [11]. The extant literature contains studies indicating that chronic wounds are more prevalent among women [14], yet other studies suggest that they are more prevalent among men [7, 11]. Furthermore, the prevalence of chronic wounds is notably higher in the elderly population due to the aging process, which has been shown to result in a protracted healing time for wounds [7,11,14]. In the healing process for all types of wounds, it is imperative to consider patients' age and the presence of a systematic or metabolic disease. In particular, impaired glucose metabolism in DM and increased subcutaneous adipose tissue in obesity have been demonstrated to adversely affect the wound healing process [15]. Moreover, it is hypothesized that the decrease in patient discomfort with wound symptoms observed across income levels may be attributable to the financial strain associated with chronic wound treatment and the variation in access to healthcare services [16]. In light of these findings, the sociodemographic characteristics of the patients were consistent with the literature, and the absence of significant differences in symptom experiences highlights the secondary outcome of the study.

The majority of patients exhibited a wound duration ranging from two to 12 months, adhered to a daily wound care regimen, frequently underwent surgical interventions at the wound site, and had previously been admitted to the hospital. The healing process of chronic wounds is closely related to wound-based factors, including wound size, duration, and depth [4]. A retrospective study of DFUs revealed that the average ulcer duration was 10 months, 55% of patients received day treatment, and those receiving inpatient treatment stayed in the hospital for an average of 26 days [17]. A study of patients with pressure injuries revealed that 79% of subjects had pressure ulcers prior to hospitalization. The study indicated that prolonged length of stay posed a high risk for ulcer development [18]. When taking into account the healing time, dressing change frequency, and infection factors in wound management [19], it becomes evident that patients need to determine appropriate wound care practices rather than dressing change frequencies. In light of the aforementioned results on chronic wounds, it is evident that the treatment process is intricate. This observation suggests that the patients in the present study were unable to effectively manage their wound care.

A close examination of the patient's wounds reveals that the majority were located in the lower extremities and the sacrum/coccyx region. Furthermore, the presence of pressure sores with DFU was observed. The findings indicate a reciprocal relationship between patient-reported wound localization and the classifying nature of the wound. Patients with infectious wounds exhibited significantly higher symptom experiences compared to patients with other wound types, and patients with DFU wounds demonstrated the lowest symptom experiences. A meta-analysis of chronic wounds reveals that ulcers most frequently manifest in the lower extremities [14]. In a separate study, it was documented that the prevalence of chronic wounds exhibited an upward trend over time, with a significant escalation observed in

the incidence of pressure sores and DFUs [20]. It was noted that the primary etiology of chronic wounds is infection and diabetic ulcers. However, a greater prevalence of secondary wounds was observed in traumatic wounds, and the high number of repeated hospitalizations of patients was mentioned [21]. In osteomyelitis, it has been documented that the prevalence of pain, fever, and edema in the affected region is higher than in other wound types [22], thereby corroborating the findings of our research.

In this study, the general symptom experience of patients with chronic wounds was found to be low. The most common symptom experience was found to be aesthetic distress, followed by discharge/leakage, edema around the wound, pain (during dressing/wound care), and odor symptoms, in this order. According to the patient reports, the symptoms that are most frequently associated with minimal issues are itching and bleeding. In patients suffering from chronic wounds, the perception of illness has been demonstrated to exert a detrimental effect on quality of life [23]. In a subsequent investigation of chronic wounds, it was documented that patients exhibited the most aesthetic distress and the least itching symptoms [10]. A parallel investigation yielded analogous results, with subjects demonstrating elevated levels of aesthetic anxiety and experiencing symptoms such as heaviness, itching, and drainage from the wound. Their general symptom experience was found to be minimal, aligning with the findings of the present study [12]. In light of the assertion that patient-reported factors should be considered in order to enhance the quality of wound care [24], it is imperative to assess symptoms from the patients' perspective. A study was conducted to evaluate the symptoms exhibited by patients with chronic wounds. The study's findings indicated that patients experienced an average of nine symptoms. The most prevalent symptoms included pain during dressing changes, exudation, activity intolerance, anxiety, and sleep disturbances. Additionally, the study noted that the quality of life of the patients decreased as the number of symptoms increased [25]. A patient's experience of symptoms related to a chronic wound may be influenced by a variety of factors, including individual characteristics, the type of wound, its location, and its depth. Furthermore, the study found that wound characteristics explained 13.4% of the variance in patients' symptom experience, with wound classification and wound area identified as significant predictors. This highlights the influence of wound characteristics on symptom experience. Similarly, in the study by Lin et al. (2024), the scar was identified as a symptom that significantly affects patients' quality of life [25]. It is particularly important to note that wound size plays a critical role in evaluating the success of clinical interventions [26]. To enhance the effectiveness of current wound management practices, it is imperative to identify issues from the perspective of all key stakeholders, including wound care clinicians, biomedical engineers, administrators, as well as patients and caregivers [16]. It is imperative to acknowledge the significance of defining patient expectations in the development of effective treatment strategies [3].

Limitations of the study

The cultural variations among the patient population may have influenced their experiences of wound symptoms, given that the study was conducted at a hospital located in the southeastern region of Türkiye. The presence of diverse wound types among the patient cohort, in conjunction with the reliance on self-reported data, introduces potential risks of bias. Furthermore, the evaluation of patient symptoms was conducted in a single time period. However, given the paucity of studies evaluating patient experiences in chronic wounds, the study's findings contribute significantly to the extant literature.

Conclusion

Patients with chronic wounds experience a multitude of symptoms. In the study, aesthetic concerns, discharge/leakage, periwound edema, pain, and odor were identified as the most frequent and distressing symptoms experienced by patients. Patients were found to have a generally low experience of symptoms, and wound classification and wound area emerged as significant variables in predicting this experience. Clinicians providing wound care can contribute to the healing process by considering the symptoms experienced by patients, thereby supporting improvements in patients' quality of life. In the context of chronic wound care, patient self-reporting of symptoms is a crucial component of the wound treatment process, as it facilitates effective follow-up care and management. Consequently, a comprehensive and multidimensional evaluation of patients' wounds may serve as a foundation for the development of novel treatment methods, the reduction of care costs, and interventions aimed at enhancing the quality of life of patients. Furthermore, it may enhance the quality of nursing care by ensuring the sustainability of wound care.

Conflict of Interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Ethical Approval

This study was approved by the Scientific Research Ethics Committee of Şırnak University (number: 2023/78050 date: 10/17/23).

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