ORIGINAL ARTICLE

The effect of peripheral neuropathy on daily life activities in patients receiving chemotherapy

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ABSTRACT

Objective: The aim of this study is to determine the relationship between pain and pain related factors associated with peripheral neuropathy and daily life activities in patients receiving chemotherapy.
Methods: The study used a descriptive and cross-sectional design to examine 80 patients who came to the outpatient chemotherapy unit of two university hospitals to receive chemotherapy drugs such as taxane, platinum analogs and vinca alkaloids. The data were collected by using face-to-face interview method through "General Information Form", "S-LANSS Pain Scale" that is a bedside test for distinctive diagnosis of neuropathic pain and "Health Assessment Questionnaire (HAQ)" which is a scale prepared by the researcher and measures daily activities to evaluate physical disability.
Results: In the group with neuropathic pain, HAQ scores ($p = .003$; $p < .01$) and S-LANSS scores ($p = .005$; $p < .01$) of the patients who did not have hand-foot complaints prior to the treatment but experienced hand-foot discomfort with the beginning of chemotherapy treatment, were found to be statistically significantly higher. There was a statistically significant positive relation between HAQ score and S-LANSS pain score at the level of 61.2% ($r = 0.612$; $p = .001$; $p < .01$).
Conclusions: It was concluded that the symptoms of Chemotherapy-Induced Peripheral Neuropathy (CIPN) and related pain and pain-related factors negatively affect the level of doing daily life activities.

Key Words: Chemotherapy, Peripheral neuropathy, Neuropathic pain, Physical activity

1. INTRODUCTION

Cancer continues to be an important health problem for the world due to its mortality, burden of the disease, and ever-increasing incidence. According to the World Health Organization (WHO) report, it is stated that cancer is the cause of 8.8 million people's death in 2015 globally.

Although cancer treatment is determined according to the histological structure of the tumor, stage of the disease and metastasis, the most common cancer treatments are surgery, radiotherapy, immunotherapy and chemotherapy. Some side effects may develop during chemotherapy treatment and the severity and type of these side effects may vary from person to person, and may lead to reducing the dose of the treatment or discontinuation of the treatment by affecting the patient's quality of life.[1–4]

One of the concerns that should be considered when using chemotherapy drugs is drug toxicity. Drug toxicity causes cardiotoxicity, neurotoxicity, eye, lung, hematologic, skin

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and renal toxicity, but also increases morbidity and mortality rate.[5] Also, neurotoxicity is a significant dose-limiting side effect that leads to discontinuation or reduction of drug therapy. In the literature, the peripheral nervous system has been reported to be more sensitive to the neurological effects of chemotherapy compared to the central nervous system.[6–8] Neurotoxicity is more common in patients receiving chemotherapeutic agents including platinum analogs, vinca alkaloids, taxanes, ifosfamide and methotrexate.[6] The most common symptoms of CIPN experienced by patients are defined as burning, numbness, tingling, needling, a feeling of stinging/incision, muscular contractions and electric-shock like pain. Signs and symptoms of neuropathy, often starts with the big toe first, reaches feet, ankles, and then legs.[6, 9, 10] They may also cause weakness in the hand and foot muscles due to the affected motor fibers.[11]

Patients do not use the word "pain" when describing the discomfort in their hands and feet.[12] However, Reyes-Gibby et al. state that the pain suffered by 40% of cancer patients is neuropathic pain.[11] Painful and painless symptoms of neuropathy include numbness, loss of balance, muscle weakness, tingling, weakness, lack of coordination, short-term memory loss, loss of depth perception, concentration problem, sensitivity to cold, pain, burning, muscle aches, pinprick, sharp pain, joint pain, electric shock-like pain, fever-like pain, pressure and stabbing pain. Neuropathic pain symptoms may adversely affect daily life activities such as writing, walking, sleeping, doing housework, or exercising.[12]

It is stated in the literature that, when the side effect of the drug is encountered, changes to be made in the treatment and the supplementary therapies to be added are determined to be of great significance. Also, the evaluation of these symptoms, which adversely affect the treatment process of the cancer, have been found to be significant in terms of enhancing the life quality of patients by early detection of symptoms, ensuring the continuation of the treatment, and preventing possible psychological problems that may arise. Training and awareness should be established for neuropathy, evaluation of peripheral neuropathy with toxicity assessment scales, early detection and prevention of symptoms by continuous observation and recording, and pharmacological and non-pharmacological methods should be evaluated. Thus, peripheral neuropathy and neuropathic pain should be reported, and the quality of life of the patient should be improved by conducting interventions.[13–15]

The present study was designed to determine the relationship between pain related factors associated with peripheral neuropathy and pain with the daily life activities in patients receiving chemotherapy.

2. METHODS

2.1 Type of the study

This study was carried out between February 2017 and June 2017 in a descriptive, correlational, and cross-sectional type in the Outpatient Chemotherapy Units of the Health Sciences University Haydarpaşa Numune Training and Research Hospital and the Health Sciences University Sultan Abdülhamid Han Training and Research Hospital.

2.2 Population and sample

The population of the study consisted of patients who came to the Outpatient Chemotherapy Units of Haydarpaşa Numune Training and Research Hospital and Sultan Abdülhamid Training and Research Hospital Ambulatory between February 2017 and June 2017 to receive chemotherapy drugs such as taxane, platinum analogs, and vinca alkaloids.

The sample consisted of patients who were aged 18 or over, continued chemotherapy treatment, had already received at least two cures (cycle- one chemotherapy followed by one rest period) of chemotherapy, had been receiving at least one of the drug groups including taxane class compounds, platinum-based compounds, or vinca alkaloids as chemotherapy agents, had no communication problems, submitted consent for participation in the study, and were oriented to time and place. A power analysis was conducted using the G*Power (v3.1.7) software package to determine the sample size. In the literature, the rate of neuropathic pain observed in patients with cancer was determined to vary between 27 and 30%. For this reason, assuming that we might obtain a 28% rate, the sample size considered to represent the population at the highest level was determined to be 80 based on α = 0.10 risk and 80% power.

2.3 Data collection tools

Data were collected using a "General Information Form", which was developed by the researcher in light of literature and expert opinion, the "S-LANSS Pain Scale", and the 'Health Assessment Questionnaire' through face-to-face interviews. Each interview lasted about 10 minutes.

2.3.1 *The general information form*

The form, designed in light of the literature by the researcher, consists of 20 questions that intend to determine the sociodemographic characteristics of the patients (age, gender, educational status, and occupation), their disease/health characteristics (smoking, alcohol consumption, time of the disease diagnosis, the length of chemotherapy treatment, medications used, existing chronic diseases, prescription/non-prescription drug use, the use of supportive treatment method, diagnosis), and the disease-related discomfort in hands and feet.

2.3.2 *The S-LANSS pain scale*

The S-LANSS pain scale is a bedside test for the distinctive diagnosis of neuropathic pain and nociceptive pain. The scale is a modified form of the LANSS pain scale, allowing the person to self-perform the test. The Turkish adaptation study was carried out by Koç ER and Erdemoğlu AK. S-LANSS was developed to distinguish whether the pain is of neuropathic (arising pain type caused by a change in a neurological structure or function, without continuous nociceptive stimulation) or nociceptive (pain type caused by stimulation of nociceptors as a result of tissue injury) origin through self-answers of the patient without clinical examination and further examination. Also, the S-LANSS pain scale includes a body map to identify painful areas, and in the pain score patients grade the worst pain that they experienced the previous week. In patients who grade the pain 12 or more at the end of the scoring, the current pain is evaluated primarily in favor of neuropathic pain. The S-LANSS pain score consists of seven items. The first five items are about the symptoms of pain. The last two items are aimed at determining whether there is the presence of allodynia and reduced pain sense.[16, 17]

2.3.3 *The Health Assessment Questionnaire*

The Health Assessment Questionnaire (HAQ) was created in 1980 by Fries et al to evaluate physical disability in patients with rheumatoid arthritis. In addition to its use mostly in patients with arthritis, the form could be used in chronic diseases, as well. The questionnaire was adapted to Turkish in 2004 by Küçükdeveci A. et al. The HAQ is a scale that consists of a total of 20 items in eight sections and evaluates daily life activities. Each item is scored from 0 to 3 (0: I do it without any difficulty; 1: I do it with some difficulty; 2: I do it with much difficulty; 3: I am unable to do it). Scoring also includes the use of aids or devices and the help requested from another person.

The sections that form the scale include dressing and grooming, arising, eating, walking, hygiene, reach, grip, and daily activities. Each section contains two or three items. Also, each section is scored separately and the mean score of the eight sections is determined as the single HAQ score that can vary between 0 and 3. Total HAQ Score is obtained by adding the highest scores of each subgroup and dividing it into eight. The scores obtained from the HAQ incompetence index are classified as "0-1" mild level of incompetence, "1-2" moderate level of incompetence, and "3" severe level of incompetence. In the scoring of the sections, the highest score obtained from the items constituting that section is accepted as the score of the section.[18, 19]

2.4 Ethics of the study

At the outset, Ethics Committee approval of Üsküdar University, the written permission of the Ministry of Health, Turkey Public Hospitals Institution, the permission of the authors for using the Health Assessment Questionnaire and the S-LANSS Pain Scale, and patient consent were obtained.

2.5 Data analysis

Data were analyzed using the NCSS (Number Cruncher Statistical System) 2007 (Kaysville, Utah, USA) software package. In addition to descriptive statistics (mean, standard deviation, median, frequency, ratio, minimum, maximum values), Student's *t*-test, Mann-Whitney *U* test, Kruskal-Wallis test, Pearson's Chi-Square test, Fisher-Freeman-Halton test, and Fisher's Exact test, and Spearman's Correlation Analysis were employed in the analyses. Data were evaluated at $p <$ .05 significance level.

2.6 Limitations of the study

The results of the study were not generalizable due to the limited number of patients involved in the study from two institutions, which was accepted as the limitation of the study.

3. RESULTS

In this study conducted to investigate the relationship of peripheral neuropathy-related pain with daily life activities in patients receiving chemotherapy, the neuropathic pain and individual characteristics of the patients are shown in Table 1.

Of the 80 patients participating in the study, 58 (72.5%) were found to develop neuropathic pain. Also, 72.5% (n = 58) of the patients in the neuropathic pain group were in the 39-79 age range, and there was no statistically significant difference between the groups in terms of age, gender, level of education, type of chemotherapy drugs, and the number of cures.

While there was no significant difference between Total HAQ scores and gender, Total HAQ score was observed to be significantly higher in patients with primary or lower education ($p <$ .05) (see Table 1).

In the study, 10% (n = 8) of the patients were found to be smoking, 3.7% (n = 3) used alcohol, 38.8% (n = 31) had hypertension, 31.3% (n = 25) had diabetes, 3.8% (n = 3) had neurological diseases, and 2.5% (n = 2) had renal disease.

As for the chemotherapy drug of the patients, 47.5% (n = 38) were receiving platinum, 35.0% (n = 28) taxane, 3.7% (n = 3) vinca, 8.8% (n = 7) taxane + platinum, 3.7% (n = 3) platinum + vinca, and 1.3% (n = 1) taxane followed by vinca class of drugs. Besides, the number of cures given to the patients was as follows: 16.3% (n = 13), 2 cures; 15.0% (n = 12), 5 cures; 15.0% (n = 12), 6 cures; and 26.3% (n = 21), 7 or more cures.

Table 1. Comparison of the patinets characteristics according to observation of neuropathic pain and total HAQ score (n = 80)

Individual characteristics	Neuropathic pain (+) (n = 58)	Neuropathic pain (-) (n = 22)	*p*
Age			
Min-Mak (Median)	39-79 (58)	31-74 (60)	[a] .989
Avg ± *SD*	58.41 ± 10.78	58.45 ± 12.64	
Gender			
Female	31 (53.4)	10 (45.5)	[b] .523
Male	27 (46.6)	12 (54.5)	
Level of education			
Primary school and below	37 (63.8)	9 (40.9)	
Secondary and high school	14 (24.1)	7 (31.8)	[c] .113
College	7 (12.1)	6 (27.3)	
Diagnosis			
Lung cancer	7 (12.1)	2 (9.1)	
Colon cancer	13 (22.4)	5 (22.7)	
Breast cancer	20 (34.5)	8 (36.4)	[c]1.000
Rectum cancer	4 (6.9)	2 (9.1)	
Other types	14 (24.1)	5 (22.7)	
Type of chemotherapy drugs			
Platinum	28 (48.3)	10 (45.5)	
Platinum+Vinca	1 (1.7)	2 (9.1)	
Taxane	22 (37.9)	6 (27.3)	
Taxane+Platinum	4 (6.9)	3 (13.6)	[c] .188
Vinca	3 (5.2)	0 (0)	
Taxane followed by vinca class of drugs	0 (0)	1 (4.5)	
The number of cures			
1-3 cures	15 (25.9)	9 (40.9)	
4-6 cures	28 (48.2)	7 (31.8)	[b] .332
≥ 7 cures	15 (25.9)	6 (27.3)	

	Total HAQ Scores			*p*
	N	Min-Max (Median)	Avg ± *SD*	
Gender				
Female	41	0-2.88 (1.38)	1.326 ± 0.889	[d] .361
Male	39	0-3 (1.13)	1.135 ± 0.960	
Level of education				
Primary school and below	46	0-2.88 (1.63)	1.495 ± 0.820	
Secondary and high school	21	0-2.88 (0.75)	0.995 ± 0.956	[e] .008**
College	13	0-3 (0.38)	0.690 ± 0.942	

Note. [b] Pearson Chi-Square Test; [c] Fisher Freeman Halton Test; [d] Mann Whitney U Test; [f] Fisher'sExact Test; ** $p < .01$; [a] Student-*t* Test; [b] Pearson Chi-Square Test

When the distribution of chemotherapy-induced discomfort in hands and feet of the patients by the chemotherapy drug classes received was examined in the study, the following problems were observed: sensitivity to cold in 24 patients and tingling in 20 patients receiving platinum; numbness in 2 patients receiving platinum + vinca; numbness in 14 patients, tingling in 13 patients, and burning in 12 patients receiving taxane; pain in joints in 4 patients and numbness in 4 patients using taxane + platinum; reduced sensitivity in 3 patients receiving vinca; and numbness in one patient receiving taxane followed by vinca (see Table 2).

Table 2. The range of the observation of the discomfort in hands and feet according to the the type of chemotherapeutic medicine applied (n = 80)

[x]Discomfort in hands and feet	Platinum n (%)	Platinum+Vinca n (%)	Taxane n (%)	Taxane+Platinum n (%)	Vinca n (%)	Taxane followed by vinca class of drugs n (%)	[c]*p*
Tingling	20 (52.6)	0 (0)	13 (46.4)	2 (28.6)	2 (66.7)	0 (0)	[c].425
Burning	11 (28.9)	0 (0)	12 (42.9)	2 (28.6)	0 (0)	0 (0)	[c].556
Loss of balance	9 (23.7)	0 (0)	7 (25)	3 (42.9)	1 (33.3)	0 (0)	[c].756
Muscle weakness	7 (18.4)	1 (33.3)	5 (17.9)	1 (14.3)	0 (0)	0 (0)	[c].956
Muscle cramps	7 (18.4)	0 (0)	8 (28.6)	3 (42.9)	2 (66.7)	0 (0)	[c].257
Numbness	16 (42.1)	2 (66.7)	14 (50)	4 (57.1)	2 (66.7)	1 (100)	[c].804
Pain in joints	7 (18.4)	0 (0)	7 (25)	4 (57.1)	1 (33.3)	0 (0)	[c].273
Elektric shock	16 (42.1)	0 (0)	6 (21.4)	2 (28.6)	0 (0)	0 (0)	[c].304
Pinprick	15 (39.5)	1 (33.3)	6 (21.4)	2 (28.6)	1 (33.3)	0 (0)	[c].695
Knife Stabbing	4 (10.5)	0 (0)	2 (7.1)	2 (28.6)	0 (0)	0 (0)	[c].631
Hot Flush	7 (18.4)	0 (0)	9 (32.1)	1 (14.3)	0 (0)	0 (0)	[c].700
Heat sensivity	4 (10.5)	0 (0)	6 (21.4)	1 (14.3)	0 (0)	0 (0)	[c].789
Cold Sensivity	24 (63.2)	0 (0)	8 (28.6)	1 (14.3)	1 (33.3)	0 (0)	[c].006
Topognosis (localizing the sense of touch)	11 (28.9)	1 (33.3)	10 (35.7)	2 (28.6)	3 (100)	0 (0)	[c].225

Note. [x] Multiple choice is applied; [c] Fisher Freeman Halton Test

Of the 58 patients with neuropathic pain, 13 were determined to get help from another person while dressing, 9 while arising, 10 while eating, 11 while walking, 18 while meeting their hygienic needs, 10 while reaching an object, 20 while gripping or opening an object, and 29 while doing their daily life activities (see Table 3).

As seen in Table 4, the rate of discomfort experienced by patients in their hands and feet (tingling, burning, loss of balance, muscle weakness, muscle cramps, numbness, pain in joints, elektric shock, pinprick, knife stabbing, hot flush, heat sensivity, cold sensivity) as of the onset of chemotherapy administration and their Total HAQ scores were found to be statistically significantly higher ($p = .001$; $p < .01$).

In the study, while the VAS scores and Total HAQ scores of the group with neuropathic pain were found high, a positive 61.2% correlation was determined between Total HAQ score and the S-LANSS pain score ($p = .001$; $p < .01$, $r = 0.612$) (see Table 5).

The comparison of Total HAQ scores by painful symptoms of peripheral neuropathy in hands and feet indicated that the Total HAQ scores of cases with burning were statistically significantly higher ($p = .001$; $p < .01$) (see Table 6).

4. Discussion

This study highlights which neuropathic symptoms are most frequently reported in patients receiving chemotherapy, how patients describe their symptoms, and how these symptoms affect their daily lives. Although chemotherapy drugs are the most commonly used medication in cancer treatment, side effects may develop during treatment. The severity and type of side effects differ from person to person; yet, they may affect the patient's quality of life and cause serious consequences such as discontinuation of treatment, reduction of the treatment dose or termination of treatment. Therefore, this study investigated the relationship of pain associated with peripheral neuropathy in patients receiving chemotherapy with their daily life activities, and the findings obtained were discussed in light of the literature.

Table 3. Comparison of HAQ scores of the patients experiencing neuropathic pain according to their daily abilities (n = 58)

Daily life activities • **Without any difficulty (HAQ = 0)** • **With some diffuculty (HAQ = 1)** • **With much difficulty (HAQ = 2)** • **Unable to do (HAQ = 3)**	**HAQ Scores**		
	n	**Min-Max (Median)**	**Avg ±*SD***
Dress			
Without any difficulty	16	0-1.75 (0.38)	0.482 ±0.539
With some difficulty	23	0.13-2.5 (1.75)	1.507 ±0.677
With much difficulty	7	1.38-2.75 (2)	1.929 ±0.456
Unable to do	12	1.25-3 (2.38)	2.323 ±0.496
Arise			
Without any difficulty	22	0-2.13 (0.5)	0.652 ±0.66
With some difficulty	22	0.28-2.25 (1.75)	1.694 ±0.499
With much difficulty	10	0.88-2.88 (2.31)	2.175 ±0.641
Unable to do	4	2.25-3 (2.56)	2.594 ±0.313
Eating			
Without any difficulty	16	0-2.63 (0.67)	0.685 ±0.781
With some difficulty	23	0.25-2.5 (1.38)	1.267 ±0.646
With much difficulty	7	1.88-2.25 (2.13)	2.107 ±0.134
Unable to do	12	1.75-3 (2.38)	2.406 ±0.385
Walking			
Without any difficulty	16	0-2.25 (0.31)	0.570 ±0.735
With some difficulty	19	0.28-2.13 (1.38)	1.263 ±0.528
With much difficulty	9	0.75-2.5 (2)	1.903 ±0.483
Unable to do	14	1.75-3 (2.38)	2.393 ±0.379
Hygiene			
Without any difficulty	15	0-1.13 (0.28)	0.318 ±0.359
With some difficulty	9	0.25-1.75 (1.13)	1.038 ±0.449
With much difficulty	12	0.75-2.75 (1.88)	1.833 ±0.507
Unable to do	22	1.38-3 (2.19)	2.165 ±0.447
Reach			
Without any difficulty	15	0-1.25 (0.25)	0.291 ±0.355
With some difficulty	17	0.63-2.25 (1.5)	1.515 ±0.508
With much difficulty	11	0.75-2.5 (2)	1.932 ±0.489
Unable to do	15	0.88-3 (2.25)	2.158 ±0.633
Grip			
Without any difficulty	15	0-2 (0.25)	0.433 ±0.553
With some difficulty	12	0.28-2 (1.13)	1.041 ±0.548
With much difficulty	13	1.13-2.5 (1.75)	1.865 ±0.446
Unable to do	18	1.5-3 (2.13)	2.250 ±0.416
Activities			
Without any difficulty	10	0-0.75 (0)	0.150 ±0.249
With some difficulty	6	0.38-1.75 (1)	0.979 ±0.550
With much difficulty	11	0.28-2.5 (1.63)	1.476 ±0.724
Unable to do	31	0.63-3 (2)	1.940 ±0.611

Table 4. Comparison of patients' neuropathic pain and total HAQ scores experiencing discomfort in hands and feet as of the onset of chemotherapy administration

	Neuropathic pain (+) (n = 58)	Neuropathic pain (-) (n = 22)	*p*
The rate of discomfort experienced by patients in their hands and feet as of the onset of chemotherapy administration			
Yes	48 (82.8)	10 (45.5)	[b] .001**
No	10 (17.2)	12 (54.5)	

	Total HAQ Scores			*p*
	N	Min-Max	Avg ± *SD*	
The rate of discomfort experienced by patients in their hands and feet as of the onset of chemotherapy administration				
Yes	58	0-3 (1.63)	1.455 ± 0.901	[d] .001**
No	22	0-2.25 (0.44)	0.648 ± 0.715	

Note. ** $p < .01$; [b] Pearson Chi-Square Test; [d] Mann Whitney *U* Test

Table 5. Comparison of pain and total HAQ scores of the patients experiencing neuropathic pain

	Neuropathic pain (+) (n=58)	Neuropathic pain (-) (n=22)	*p*
Total HAQ			
Min-Max (Median)	0-3 (1.7)	0-2.9 (0.3)	[d] .001**
Avg ± *SD*	1.44 ± 0.88	0.68 ± 0.81	
VAS (Visual Analog Scale)			
Min-Max (Median)	0-10 (6)	0-10 (1)	[d] .001**
Avg ± *SD*	5.76 ± 2.89	2.14 ± 2.83	

Note. ** $p < .01$; [d] Mann Whitney *U* Test

The results of this study revealed that the most frequent symptoms observed in the patients according to the class of drugs were sensitivity to cold (63.2%) and tingling (52.6%) in patients using platinum; the most numbness in patients using platinum + vinca (66.7%); the most numbness (50%), tingling (46.4%), and burning (42.9%) in patients using taxane; pain in joints (57.1%) and numbness (57.1%) in patients using taxane + platinum; reduced sensitivity (100%) in patients using vinca. On the other hand, Tofthagen (2011) determined that the most common symptoms in patients receiving oxaliplatin were cold sensitivity (84.8%), tingling in hands (66.6%) and reduced sensitivity (54.5%). In the study of Kirömeroğlu,[20] neuropathic symptoms were mostly observed in platinum drug groups, and the most common ones were weakness, pain in joints, muscular cramps, discomfort in hands, and numbness and tingling in hands. Besides, in the study of Boru et al.,[23] neurotoxicity was observed to increase in weekly intake of paclitaxel. According to these results, cancer drugs were observed to cause a high rate of polyneuropathy.

In the study, neuropathic pain was observed in 72.5% (n = 58) of the patients. When the definition of the discomfort in these patients' hands and feet was examined, they were observed to respond using phrases such as numbness, burning, electric-shock-like pain, chills, fatigue, reduced sensitivity, and tingling. Also, the word "pain" was used by only 8.8% (n = 7). In the study conducted by Tofthagen in 2010, 50% of patients (n = 14) had pain characterized by neuropathic pain, and they described this pain as an electric-shock like pain, stabbing, or sharp pain. Also, 10 patients used the word "pain" when describing the painful symptoms they experienced, while 4 of them did not use it at all. Accordingly, it is noteworthy that patients with neuropathic pain did not use the word "pain" to describe the discomfort they experienced. In this study, the patients responded "yes" to the question "Do you experience any discomfort in your hands and feet?", and they marked the painful symptoms of peripheral neuropathy; however, they gave 0 points in the assessment of the neuropathic pain score. This suggested that either the patients did not accept that they had pain or they experienced sensory loss as a result of advanced neuropathy, and therefore the level of feeling pain decreased.

Table 6. Comparison of total HAQ scores according to painful and painless symptoms of peripheral neuropathy in hands and feet (n = 80)

Painful symptoms of peripheral neuropathy in hands and feet	Total HAQ Scores			[d]*p*
	n	Min-Max (Median)	Avg ± *SD*	
Burning				
Yes	25	0.13-3 (2)	1.775 ± 0.846	.001**
No	55	0-2.88 (0.88)	0.986 ± 0.855	
Muscle cramps				
Yes	20	0-2.75 (1.44)	1.248 ± 0.816	.933
No	60	0-3 (1.19)	1.228 ± 0.963	
Pain of joints				
Yes	19	0-3 (1.63)	1.388 ± 0.915	.410
No	61	0-2.88 (1.13)	1.184 ± 0.928	
Elektrical shocks				
Yes	24	0-2.88 (0.81)	1.161 ± 1.022	.732
No	56	0-3 (1.31)	1.263 ± 0.886	
PinPrick				
Yes	25	0-3 (1.75)	1.570 ± 0.913	.030*
No	55	0-2.88 (1.13)	1.079 ± 0.895	
Knife Stabbing				
Yes	8	0.25-3 (1.19)	1.347 ± 1.007	.658
No	72	0-2.88 (1.25)	1.220 ± 0.921	
Hot Flush				
Yes	17	0-3 (0.88)	1.134 ± 0.941	.705
No	63	0-2.88 (1.38)	1.259 ± 0.925	
Heat Sensivity				
Yes	11	0-3 (0.88)	1.195 ± 1.055	.922
No	69	0-2.88 (1.38)	1.239 ± 0.909	
Cold Sensivity				
Yes	34	0-3 (1.19)	1.221 ± 0.999	.934
No	46	0-2.88 (1.31)	1.241 ± 0.875	
Painless symptoms of peripheral neuropathy in hands and feet				
Tingling				
Yes	37	0-3 (1.38)	1.243 ± 0.941	.900
No	43	0-2.88 (1.25)	1.224 ± 0.920	
Loss of balance				
Yes	20	0-3 (1.69)	1.439 ± 0.924	.239
No	60	0-2.88 (1.19)	1.164 ± 0.921	
Muscle weakness				
Yes	14	0-3 (1.81)	1.616 ± 0.959	.092
No	66	0-2.88 (1.13)	1.151 ± 0.902	
Numbness				
Yes	39	0-3 (1.63)	1.486 ± 0.886	.015*
No	41	0-2.75 (0.88)	0.991 ± 0.904	
Topognosis				
Yes	27	0-3 (1.38)	1.342 ± 0.946	.420
No	53	0-2.88 (1.25)	1.177 ± 0.916	

Note. [d] Mann Whitney *U* Test; *$p < .05$; **$p < .01$

Shahidi et al.[22] reported that as a result of a cancer diagnosis or cancer treatment, there were changes in patients' daily life activities such as sleeping or taking a nap during the day, doing housework, doing exercises, doing sports, watching TV, doing nothing at all, and visiting relatives. On the other hand, Tofthagen stated that patients had difficulty in performing ac-

tivities such as doing hobbies, sleeping, exercising, walking, gripping objects, doing housework, writing, dressing, and driving.[12] This study also found that cancer patients had difficulties in doing their daily life activities (gripping and opening things, meeting hygienic needs, dressing, walking, eating, reaching an object, and raising).

In the present study, the comparison of Total HAQ scores and S-LANSS scores in terms of the number of cures yielded no statistically significant difference. However, Total HAQ scores of patients who received chemotherapy more than three cures were observed to be higher. In the study of Ustundag, the physical well-being of the patient group receiving taxane was not affected, yet the HAQ scores of the group using taxane in this study were found high.[26] This may have stemmed from the fact that the number of patients in this study, receiving only platinum and only taxane group drugs was high and that increased neurotoxicity due to weekly intake of paclitaxel drug augmented Total HAQ score.

In the study, the comparison of Total HAQ score and S-LANSS pain score indicated that there was a statistically significant and positive relationship at a level of 61.2% ($r = 0.612$; $p = 0.001$; $p < 0.01$). On the other hand, VAS and Total HAQ scores of the group with neuropathic pain were also significantly higher ($p = 0.001$; $p < 0.01$). In the MIND Study (The study that compares peripheral and autonomic neuropathy with S-LANNS, HAQ and VAS scales in type 2 diabetes) conducted by Syngle et al.,[25] both LANSS and Total HAQ scores of patients were determined to decrease after the drug called minocycline, while an improvement was obtained in VAS scale. With this respect, the data of the S-LANSS, Total HAQ, and VAS scales of the present study were similar to those of the MIND study.

In our study, patients with a feeling of "burning" and "needles", which are painful symptoms of peripheral neuropathy, and "numbness", which is one of the painless symptoms, were found to have high Total scores (see Table 6). In the study of Tofthagen and Mcmillan, the physical and mental component scores of patients with numbness, tingling, electrick-shock-like pain, and high level of pain were observed to be lower, and they had more difficulty performing their daily life activities.[24] In this context, the data obtained in the study of Tofthagen and Mcmillan were similar to those of the current study.

5. Conclusions

Peripheral neuropathy related-factors and pain affect patients' ability to perform their daily activities independently. Patients with neuropathic pain have difficulty in performing daily activities and many patients carry out these activities with help either from another person or ancillary equipment. Making a very good and systematic assessment of the pain and pain-related factors that affect patients' performance of daily activities and are associated with peripheral neuropathy will help to increase patients' independence while doing their daily activities. Nurses, who have very much interaction with patients, can timely notice and do a systematic assessment of the symptoms developing in patients who get help from another person or have difficulty performing daily life activities, and they can plan and implement the appropriate nursing interventions, which will, in turn, reduce the physical dependence of the patient.

Limitations of the Study

The fact that the study was conducted in a single hospital was accepted as the limitation of the study.

Conflicts of Interest Disclosure

The authors declare they have no conflicts of interest.

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