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The effect of acupressure application on chemotherapy-induced nausea, vomiting, and anxiety in patients with breast cancer

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ABSTRACT

Objective: The purpose of this study was to determine the effect of acupressure applied to the pericardium 6 (P6 or neiguan) acupuncture point on chemotherapy-induced nausea, vomiting, and anxiety in patients with breast cancer.

Method: The study was conducted using a quasi-experimental model with a control group. It included a total of 64 patients with stages 1–3 breast cancer who received cycle two and more advanced chemotherapy in an ambulatory chemotherapy unit. There were 32 patients in the experimental group and 32 patients in the control group. Acupressure was applied to the P6 acupuncture point of patients in the experimental group with the help of a wristband. A Patient Information Form, the Beck Anxiety Inventory, and the Index of Nausea, Vomiting and Retching were employed to collect the data.

Results: It was determined that the mean nausea, vomiting, and retching scores, the total (experience, occurrence, and distress) scores, and the mean anxiety scores for patients to whom acupressure was applied at the P6 acupuncture point were statistically significantly lower compared with the scores of patients in the control group.

Significance of Results: The efficacy of applying acupressure was demonstrated. We determined that applying acupressure at the P6 point is effective in decreasing chemotherapy-induced nausea, vomiting, and anxiety in patients with breast cancer. Further research with more subjects is needed.

KEYWORDS: Breast cancer, Acupressure, Wristband, Nausea, Vomiting

INTRODUCTION

Breast cancer is the most frequently occurring malignant tumor among women in the world, as it accounts for approximately 30% of all the cancer types encountered by them. While breast cancer shows a 1–2% increase in various countries around the world every year, about a million new cases are diagnosed worldwide annually (Darendeliler & Agaoglu, 2003; Aydiner et al., 2006). Among the cancer types encountered by women in Turkey, breast cancer is the most frequent, with an incidence of 35.47 cases per 100,000 (Cancer Statistics, 2006).

Chemotherapy is administered as an adjuvant or neoadjuvant therapy for early-stage breast cancer and is also administered for palliative purposes for metastatic (advanced-stage) breast cancer (Karakus & Karakoc, 2005). While they do kill tumor cells, chemotherapy drugs can also affect the normal cells of the body Nausea and vomiting are the most frequent side effects experienced by breast cancer patients treated with chemotherapy drugs, and its severity and intensity vary from patient to patient. The nausea and vomiting associated with chemotherapy may be so severe that they lead to liquid/electrolyte imbalances and nutritional deficiencies. Some patients

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may even reject the chemotherapy altogether (Akdemir, 2005). Despite the availability of very effective antiemetic drugs, particularly drugs that have been developed in recent years such as the serotonin ($5\text{-}HT_3$) antagonists, the nausea and vomiting associated with chemotherapy continue to pose an important problem that decreases the quality of life, adversely affects treatment outcomes, leads to increased anxiety and depression, and can cause job loss (Molassiotis A, 2005; Molassiotis BS, 2005).

Because pharmacological treatments do not completely alleviate nausea and vomiting, the complementary role of nonpharmacological treatment approaches has been explored (Molassiotis et al., 2007). Some of these methods for controlling chemotherapy-induced nausea and vomiting are as follows (Fessele, 1996; Wells et al., 2007): distraction, relaxation techniques, systemic desensitization, hypnosis, therapeutic massage, acupuncture, and acupressure. Nonpharmacological methods are easy to learn, cost effective, readily available and have no side effects. In addition to these advantages, nonpharmacological methods decrease the dose and frequency of antiemetic drugs given to patients when they are used together with pharmacological methods (Molassiotis A, 2005).

In traditional Chinese medicine, nausea and vomiting can be treated by applying acupressure at the P6 point on the wrists (Yazicioglu, 1999; Cross, 2000; Hakverdioglu, 2006). Many studies have determined that acupressure is effective in decreasing the nausea and vomiting associated with motion sickness (Hu et al., 1995; Stern et al., 2001) as well as during the postoperative period (Shin et al., 2004; Shiao & Dune, 2006), the post-laparoscopic period (Tavlan, 1995; Harmon et al., 1999), pregnancy (Northeim et al., 2001; Gurkan, 2005; Helmreich et al., 2006), and chemotherapy (Dundee & Yang, 1990; Williams et al., 1992; Collins & Thomas, 2004; Gardani et al., 2006; Lee et al., 2008). Only a small number of studies have been conducted in Turkey to determine the efficacy of acupressure in controlling the nausea and vomiting associated with chemotherapy (Taspinar & Sirin, 2011; Genç et al., 2013).

The intensive and long-term treatments performed on women with breast cancer and the severe side effects of these treatments negatively affect the daily life functions of these patients and cause various psychosocial problems (Marrs, 2006). The anxiety level has been determined to be moderate (at a rate of 27%) in individuals with breast cancer (Ozkan, 2007). Because developing anxiety attacks negatively influence a patient's acknowledgment of the disease, struggle with the disease, adherence to treatment, and quality of life, determining the anxieties of cancer patients and performing supportive treatments to decrease them have become more important (Pandey et al., 2006).

The purpose of our study was to prevent the nausea and vomiting associated with chemotherapy in patients with breast cancer and to determine the effect of acupressure applied to the pericardium 6 (P6) acupuncture point using a wristband in addition to the standard antiemetic drugs used to decrease anxiety, nausea, and vomiting.

METHODS

Design

This study was conducted using a quasi-experimental model with a control group. The study population consisted of patients with stages 1–3 breast cancer who were receiving cycle two and advanced-cycle chemotherapy treatments in the ambulatory chemotherapy unit at the Atatürk University Research Hospital. The sample comprised 64 patients in total who were selected using a randomized sampling method from among the patients who met the study criteria and were willing to participate. Of these 64, 32 patients were in the experimental group (antiemetic drug + acupressure band) and 32 were in the control group (antiemetic drug only).

Study Sample

The inclusion criteria were as follows:

- receiving the same chemotherapy regimen (doxorubicin, cyclophosphamide, and/or epirubicin or CMF [cyclophosphamide, methotrexate, and 5-fluorouracil])
- capable of communicating
- had relatives to fill out the forms for illiterate patients
- had no lymphedema in their arms
- not receiving simultaneous radiotherapy treatment

Procedure

Official permissions were obtained from the ethics committee of the Atatürk University Institute of Health Sciences and from the medical oncology clinic of the Atatürk University Research Hospital. The necessary explanations related to the study were given to the individuals who participated, and their informed consent was obtained.

An acupressure wristband and its accompanying instruction manual were employed as the

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intervention materials. The wristband was introduced to patients in the experimental group, and they were taught how to use it. They were taught how to determine the P6 point and instructed that they needed to perform the same procedure for both arms. They were asked to repeat this procedure a few times in front of the researcher (see Figure 1). Patients were asked to continuously wear this band on both wrists for five days, taking it off only to wash their hands and arms or to take a shower, and putting it back on as soon as possible. The Index of Nausea, Vomiting, and Retching was given to the experimental and control groups to be filled out at home over a total of five days, including the day they received chemotherapy. They were asked to fill out the index at the same time each night. Patients in the experimental and control groups also filled out the Beck Anxiety Inventory when they came in for treatment as both a pre- and posttest.

Following each chemotherapy cycle, both groups were reminded by the clinic nurse via a telephone call the night before treatment that they needed to remember to bring these indexes to the clinic. The telephone number of the researcher was given to patients so that they could ask questions and avoid any errors when filling out the indexes.

Data Collection

The Patient Information Form, the Index of Nausea, Vomiting and Retching, and the Beck Anxiety Inventory were employed to collect the study data. The researchers collected the data using face-to-face interviews, registration forms, and questionnaires.

The answers given by patients in the experimental and control groups when they presented to the ambulatory chemotherapy unit for treatment were recorded by the researcher on the patient's Information Form. The Patient Information Form and Beck Anxiety Inventory were completed by the researcher within 20 minutes.

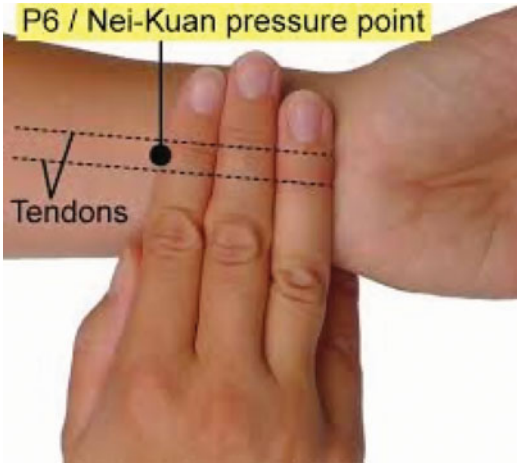

Fig. 1. P6 point.

Instrument

Patient Information Form

To determine the sociodemographic characteristics of patients, the form included questions about their age, educational status, marital status, place of residence, profession, and income level, whether she/he had other chronic diseases, what chemotherapy regimen was being administered with what properties of treatment, and which antiemetic drugs were being taken.

Beck Anxiety Inventory (BAI)

This inventory measures the frequency of the anxiety symptoms experienced by an individual. It is a Likert-type self-assessment scale consisting of 21 items that are each scored from 0 to 3 (0 = none, 1 = mild, 2 = moderate, and 3 = severe). A higher total score on the inventory indicates more severe anxiety experienced by the individual. The inventory was developed by Beck et al. (1988), and its validity and reliability have been studied by Ulusoy et al. (1998) in our country. In the latter, Cronbach's alpha internal consistency coefficient (CAICC) of the inventory was 0.93, while in our study the CAICC was 0.70.

Index of Nausea, Vomiting, and Retching

This index was developed by Rhodes and McDaniel (Rhodes & McDaniel, 1997; Rhodes et al., 1999). The CAICC for the overall index was 0.98, and ranged from 0.83 to 0.99 for the subgroups. Genç and Tan (Genç, 2010) tested its validity and reliability in our country, where its CAICC for the total index was 0.95 and varied between 0.81 and 0.95 for the subgroups. Consisting of a 5-point Likert-type questionnaire including eight questions, this index assesses the frequency and severity of nausea, vomiting, and retching experienced within a period of 24 hours. For each answer, 0 was marked for the lowest level and 4 for the highest. The nausea and vomiting scores for the patient on each of the eight items were then summed.

Data Analysis

The data obtained from our study were analyzed using the SPSS (Statistical Package for Social Sciences, Version 16.0) software program. Cronbach's alpha reliability coefficient, the Pearson product–moment correlation, the chi-squared test, and an independent *t* test were employed to analyze the data.

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RESULTS

The control variables for patients in the experimental and control groups were similar (see Table 1). While the average age of patients in the experimental group was 51.21 years ($SD = 10.95$), the average age of patients in the control group was 50.87 years ($SD = 10.25$). All patients in the experimental and control groups received standard antiemetic treatment (dexamethasone + 5-HT_3 receptor antagonist + H_2 receptor blocker) prior to chemotherapy. Patients in both groups used 5-HT_3 receptor antagonists and benzamide derivatives as antiemetics after chemotherapy.

The mean nausea experience scores for patients in the experimental group over the course of the five days of acupressure application were lower than those for patients in the control group. In addition, while the difference between the groups was statistically significant on days 3, 4, and 5 ($p < 0.05$, $p < 0.01$, and $p < 0.001$, respectively), the difference was statistically insignificant on the other days ($p > 0.05$). While the mean vomiting experience scores for patients in the experimental group over the five days of application were lower compared to patients in the control group, the difference between the groups was statistically insignificant ($p > 0.05$). While the mean retching experience scores for patients in the experimental group over the five days of application were lower compared to patients in the control group, the difference between the groups was statistically insignificant ($p > 0.05$) (Table 2).

The total mean scores for patients in the experimental group for experiencing nausea, vomiting, and retching were lower compared to patients in the control group over the five days of application. While this difference was statistically significant on days 4 and 5 ($p < 0.05$ and $p < 0.01$, respectively), it was insignificant on the other days (Figure 2).

While the mean scores for patients in the experimental group for the occurrence of nausea over the course of days 1, 2, 3, 4, and 5 were lower compared to patients in the control group, this difference between the groups was only statistically significant on days 3, 4, and 5 ($p < 0.05$, $p < 0.01$ and $p < 0.001$, respectively). The mean scores for patients in the experimental group for occurrence of vomiting on days 1 and 2 were lower compared with patients in the control group, while the difference between the groups was statistically insignificant ($p > 0.05$). Comparing the mean scores for the groups in terms of occurrence of retching, the mean scores for patients in the experimental group were lower compared with patients in the control group over the five days, but the difference between the groups was statistically insignificant ($p > 0.05$) (Table 2).

Examining total mean scores for the occurrence of nausea, vomiting, and retching, the mean scores for patients in the experimental group were lower compared to patients in the control group over the course of days 1, 2, 3, 4, and 5. The difference between the groups was statistically significant ($p < 0.05$ and $p < 0.01$) on days 4 and 5, respectively, but insignificant on the other days ($p > 0.05$) (Figure 3).

The mean scores for patients in the experimental group in terms of the distress caused by nausea were lower compared with patients in the control group over the course of the five days of acupressure application, and the difference between the groups was statistically significant on days 3, 4, and 5 ($p < 0.05$, $p < 0.01$, $p < 0.001$, respectively). The mean scores for patients in the experimental group for the distress caused by vomiting were lower compared to patients in the control group over the course of the

Table 1. *Comparison of control variables between the experimental and control groups*

Variables	Experimental ($N = 32$)		Control ($N = 32$)	
	Number	%	Number	%
Age				
29–38	6	18.8	5	15.6
39–48	4	12.5	6	18.8
49–58	12	37.5	12	37.5
59 ↑	10	31.2	9	28.1
	$\chi^2 = 0.54$, $p = 0.90$			
Educational level				
Illiterate	8	25.0	3	9.4
Primary school	15	46.9	21	65.6
High school/college	9	28.1	8	25.0
	$\chi^2 = 3.32$, $p = 0.18$			
Marital status				
Single/widowed	8	25.0	10	31.2
Married	24	75.0	22	68.8
	$\chi^2 = 0.30$, $p = 057$			
Residential area				
Village/town	6	18.8	4	12.5
County	6	18.8	9	28.1
City	20	62.4	19	59.4
	$\chi^2 = 1.02$, $p = 0.59$			
Occupation				
Unemployed	28	87.5	24	75.0
Occupied	4	12.5	8	25.0
	$\chi^2 = 3.41$, $p = 0.18$			
Income status				
Low income	8	25.0	12	37.5
Medium income	23	71.9	18	56.2
High income	1	3.1	2	6.3
	$\chi^2 = 1.74$, $p = 0.41$			
Other chronic diseases				
Yes	12	37.5	14	43.8
No	20	62.5	18	56.2
	$\chi^2 = 0.25$, $p = 0.61$			

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Table 2. *Comparison of mean scores of nausea, vomiting, and retching between the experimental and control groups*

		Day 1 $X \pm SD$	Day 2 $X \pm SD$	Day 3 $X \pm SD$	Day 4 $X \pm SD$	Day 5 $X \pm SD$	Total range
Nausea experience	Experimental	4.71 ± 3.53	4.25 ± 3.49	3.43 ± 3.06	2.46 ± 2.77	1.87 ± 2.60	0–12
	Control	5.56 ± 3.47	5.53 ± 2.18	5.21 ± 3.13	4.81 ± 2.60	4.75 ± 2.59	0–12
	Significance	$t = 0.964$	$t = 1.760$	$t = 2.295$	$t = 3.484$	$t = 4.380$	
		$df = 62$	$df = 62$	$df = 62$	$df = 62$	$df = 62$	
		$p > 0.05$	$p > 0.05$	$p < 0.05$	$p < 0.01$	$p < 0.001$	
Vomiting experience	Experimental	3.96 ± 3.18	3.18 ± 2.92	1.87 ± 2.12	1.31 ± 2.07	0.46 ± 1.64	0–12
	Control	4.78 ± 2.85	3.65 ± 2.35	1.93 ± 1.43	1.56 ± 1.46	0.31 ± 0.89	0–12
	Significance	$t = 1.073$	$t = 0.707$	$t = 0.138$	$t = 0.349$	$t = 0.472$	
		$df = 62$	$df = 62$	$df = 62$	$df = 62$	$df = 62$	
		$p > 0.05$	$p > 0.05$	$p > 0.05$	$p > 0.05$	$p > 0.05$	
Retching experience	Experimental	3.18 ± 2.20	2.46 ± 2.06	1.68 ± 1.42	1.06 ± 1.18	0.59 ± 1.13	0–8
	Control	3.71 ± 2.08	2.71 ± 1.83	2.00 ± 1.66	1.50 ± 1.31	0.62 ± 0.87	0–8
	Significance	$t = 0.991$	$t = 0.512$	$t = 0.0807$	$t = 1.393$	$t = 0.124$	
		$df = 62$	$df = 62$	$df = 62$	$df = 62$	$df = 62$	
		$p > 0.05$	$p > 0.05$	$p > 0.05$	$p > 0.05$	$p > 0.05$	
Total Experience	Experimental	11.87 ± 8.19	9.90 ± 7.66	7.00 ± 5.62	4.84 ± 5.08	2.93 ± 4.44	0–32
	Control	14.06 ± 7.91	11.90 ± 5.15	9.15 ± *4.94	7.46 ± 3.56	5.68 ± 2.79	0–32
	Significance	$t = 1.087$	$t = 1.225$	$t = 1.628$	$t = 2.392$	$t = 2.959$	
		$df = 62$	$df = 62$	$df = 62$	$df = 62$	$df = 62$	
		$p > 0.05$	$p > 0.05$	$p > 0.05$	***p < 0.05***	***p < 0.01***	
Nausea occurrence	Experimental	3.28 ± 2.45	2.90 ± 2.54	2.37 ± 2.26	1.68 ± 1.89	1.25 ± 1.77	0–8
	Control	3.84 ± 2.42	3.75 ± 1.24	3.50 ± 2.09	3.21 ± 1.73	3.12 ± 1.73	0–8
	Significance	$t = 0.923$	$t = 1.685$	$t = 2.061$	$t = 3.374$	$t = 4.267$	
		$df = 62$	$df = 62$	$df = 62$	$df = 62$	$df = 62$	
		$p > 0.05$	$p > 0.05$	***p < 0.05***	***p < 0.01***	***p < 0.001***	
Vomiting occurrence	Experimental	2.56 ± 2.28	2.18 ± 2.11	1.37 ± 1.51	1.00 ± 1.48	0.34 ± 1.12	0–8
	Control	3.15 ± 1.90	2.40 ± 1.58	1.28 ± 0.95	0.78 ± 0.97	0.21 ± 0.60	0–8
	Significance	$t = 1.130$	$t = 0.468$	$t = 0.295$	$t = 0.698$	$t = 0.553$	
		$df = 62$	$df = 62$	$df = 62$	$df = 62$	$df = 62$	
		$p > 0.05$	$p > 0.05$	$p > 0.05$	$p > 0.05$	$p > 0.05$	
Retching occurrence	Experimental	1.59 ± 1.21	1.15 ± 1.08	0.75 ± 0.62	0.50 ± 0.62	0.25 ± 0.50	0–4
	Control	1.87 ± 1.15	1.37 ± 0.94	1.03 ± 0.93	0.75 ± 0.67	0.25 ± 0.43	0–4
	Significance	$t = 0.949$	$t = 0.863$	$t = 1.419$	$t = 1.544$	$t = 0.000$	
		$df = 62$	$df = 62$	$df = 62$	$df = 62$	$df = 62$	
		$p > 0.05$	$p > 0.05$	$p > 0.095$	$p > 0.05$	$p > 0.05$	
Total occurrence	Experimental	7.43 ± 5.36	6.25 ± 4.91	4.50 ± 3.78	3.18 ± 3.23	1.84 ± 2.77	0–20
	Control	8.87 ± 5.04	7.53 ± 2.82	5.81 ± 3.14	4.75 ± 2.21	3.59 ± 1.84	0–20
	Significance	$t = 1.104$	$t = 1.277$	$t = 1.509$	$t = 2.254$	$t = 2.972$	
		$df = 62$	$df = 62$	$df = 62$	$df = 62$	$df = 62$	
		$p > 0.05$	$p > 0.05$	$p > 0.05$	***p < 0.05***	***p < 0.01***	
Nausea distress	Experimental	1.43 ± 1.16	1.34 ± 1.18	1.06 ± 0.87	0.78 ± 0.94	0.62 ± 0.90	0–4
	Control	1.71 ± 1.11	1.78 ± 1.09	1.71 ± 1.05	1.59 ± 0.87	1.62 ± 0.87	0–4
	Significance	$t = 0.988$	$t = 1.534$	$t = 2.706$	$t = 3.577$	$t = 4.499$	

Continued

Table 2. *Continued*

		Day 1 $X \pm SD$	Day 2 $X \pm SD$	Day 3 $X \pm SD$	Day 4 $X \pm SD$	Day 5 $X \pm SD$	Total range
		$df = 62$	$df = 62$	$df = 62$	$df = 62$	$df = 62$	
		$p > 0.05$	$p > 0.05$	$\boldsymbol{p < 0.01}$	$\boldsymbol{p < 0.01}$	$\boldsymbol{p < 0.001}$	
Vomiting distress	Experimental	1.40 ± 1.01	1.00 ± 0.95	0.50 ± 0.67	0.31 ± 0.64	0.12 ± 0.55	0–4
	Control	1.62 ± 1.03	1.25 ± 0.91	0.65 ± 0.48	0.37 ± 0.49	0.09 ± 0.29	0–4
	Significance	$t = 0.853$	$t = 1.072$	$t = 1.068$	$t = 0.436$	$t = 0.282$	
		$df = 62$	$df = 62$	$df = 62$	$df = 62$	$df = 62$	
		$p > 0.05$	$p > 0.05$	$p > 0.05$	$p > 0.05$	$p > 0.05$	
Retching distress	Experimental	1.59 ± 1.21	1.31 ± 1.14	0.93 ± 0.94	0.56 ± 0.71	0.34 ± 0.65	0–4
	Control	1.84 ± 1.08	1.34 ± 0.93	0.96 ± 0.78	0.75 ± 0.71	0.37 ± 0.49	0–4
	Significance	$t = 0.870$	$t = 0.119$	$t = 0.144$	$t = 1.046$	$t = 0.216$	
		$df = 62$	$df = 62$	$df = 62$	$df = 62$	$df = 62$	
		$p > 0.05$	$p > 0.05$	$p > 0.05$	$p > 0.05$	$p > 0.05$	
Total distress	Experimental	4.43 ± 3.04	3.65 ± 2.94	2.50 ± 1.98	1.65 ± 1.91	1.09 ± 1.72	0–12
	Control	5.18 ± 3.02	4.37 ± 2.37	3.34 ± 1.82	2.71 ± 1.39	2.09 ± 0.99	0–12
	Significance	$t = 0.989$	$t = 1.073$	$t = 1.771$	$t = 2.539$	$t = 2.835$	
		$df = 62$	$df = 62$	$df = 62$	$df = 62$	$df = 62$	
		$p > 0.05$	$p > 0.05$	$p > 0.05$	$\boldsymbol{p < 0.01}$	$p = 0.06$	

five days of acupressure application, but the difference between the groups was statistically insignificant ($p > 0.05$). Comparing the mean scores in terms of the distress caused by retching, the mean scores for patients in the experimental group were lower over the course of days 1, 2, 3, 4, and 5 compared to the control group. However, the difference between the groups was statistically insignificant ($p > 0.05$) (Table 2).

Considering the total mean scores for the distress caused by nausea, vomiting, and retching, the mean scores for patients in the experimental group were lower compared to those in the control group. The differences between the groups were only statistically significant ($p = 0.01$) on day 4 and were insignificant on other days ($p > 0.05$) (Figure 4).

In terms of the anxiety scores, no statistically significant difference was found between the pretest scores for the experimental and control groups ($p > 0.05$). The posttest mean anxiety score was lower in the experimental group compared to the control group, and the difference between the groups was statistically significant ($p < 0.001$) (Table 3).

DISCUSSION

Our results led us to conclude that acupressure performed on the P6 point using a wristband decreased nausea, vomiting and anxiety in patients with breast cancer.

The mean scores for patients regarding nausea, the mean scores for patients in the experimental group in terms of experiencing nausea, the occurrence of nausea, and the distress caused by nausea over the course of days 1–5 were lower compared with patients in the control group; the differences between the groups were statistically significant on days 3, 4, and 5. In a study conducted by Roscoe et al. (2003) to investigate the effect of acupressure and acustimulation performed on acupuncture point P6, the authors determined that the severity of the nausea that developed during the five days after chemotherapy was significantly decreased in the group that used the acupressure band. The results of that study were similar to the results of our study: the mean delayed nausea score was significantly lower in the group that used the acupressure band. Another study conducted by Roscoe et al. (2006) on breast cancer patients revealed that patients in the acupressure band group experienced less severe nausea compared with patients in a standard care + acustimulation band group. In a study conducted by Dibble et al. (2000) on patients with breast cancer, the experience of chemotherapy-induced nausea was significantly decreased in the acupressure group. In another study conducted by Dibble et al.

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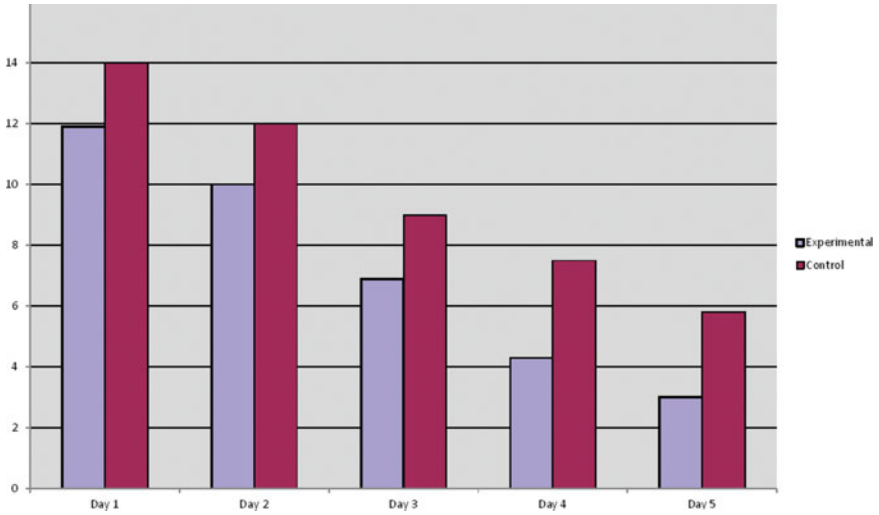

Fig. 2. Comparison of total experience mean scores between experimental and control groups.

(2007), patients with breast cancer were divided into three groups: acupressure on the P6 point, acupressure on the SI3 point (placebo), and a standard care group. Comparing the patients in the P6 acupressure group with the patients in the other groups, they observed a decrease in the severity of chemotherapy-induced delayed nausea. While a study by Ezzo et al. (2006) indicated that acupressure could decrease acute nausea, studies by Taspinar & Sirin (2011) and Said (2009) demonstrated that the mean scores in the acupressure group for both acute and delayed nausea were lower.

In our study, the mean scores for patients in the P6 acupressure group in terms of experiencing vomiting, the occurrence of vomiting, and the distress caused by vomiting were lower compared with patients in the control group on days 1 and 2. However, the differences between the groups were statistically insignificant ($p > 0.05$). In other studies in the literature (Lindley et al., 1989; Molassiotis, 2000; Molassiotis et al., 2002*a*; 2002*b*; Liau et al., 2005), days 1 and 2 were when the worst vomiting was experienced after chemotherapy. As a result of our study, it was determined that patients in the P6 acupressure group should utilize this application.

The mean scores for patients in the P6 acupressure group in terms of the experience of retching, the occurrence of retching, and the distress caused by retching were lower compared with patients in the control group on all days of acupressure application. Another study (Taspinar & Sirin, 2011) conducted on cancer patients revealed that the mean retching score for patients over five days was lower after wristband application. In a study conducted by Molassiotis et al. (2007) to investigate the effect of acupressure on chemotherapy-induced nausea and vomiting in patients with breast cancer, the authors determined that the mean scores for patients in terms of the five-day experience of retching, the occurrence of retching, and the distress caused by

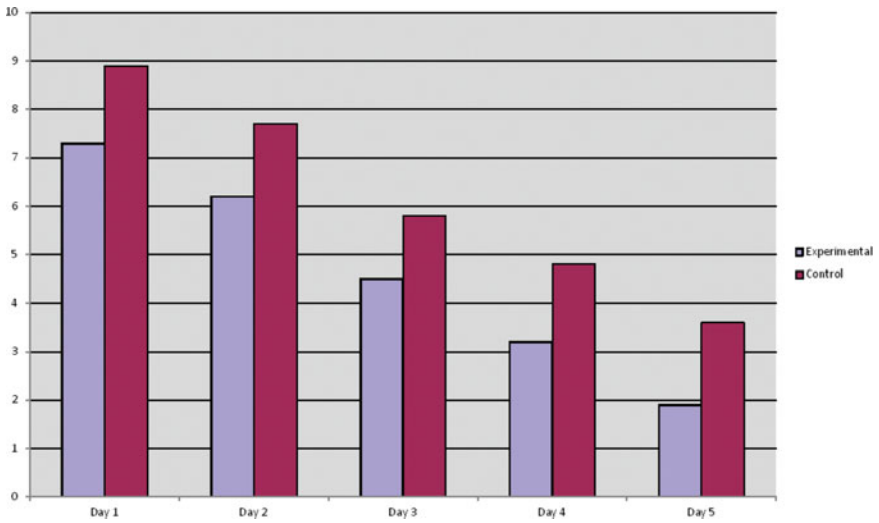

Fig. 3. Comparison of total occurrence mean scores between experimental and control groups.

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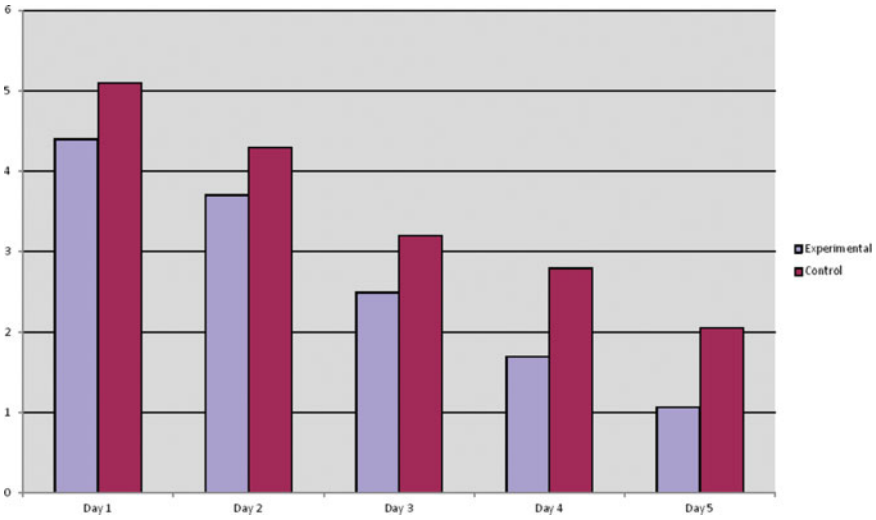

Fig. 4. Comparison of total distress mean scores between experimental and control groups.

retching were lower after wristband application compared with patients in the control group.

In our study, the total mean scores for patients in the group in which P6 acupressure was applied in terms of the experience of nausea, vomiting, and retching and the occurrence of nausea, vomiting, and retching over the course of days 1–5 were lower compared with patients in the control group, and these differences were statistically significant on days 4 and 5 ($p < 0.05$ and $p < 0.01$, respectively). The total mean scores for patients in the P6 acupressure group in terms of the distress cause by nausea, vomiting, and retching were lower compared with patients in the control group. The results of our study were also compatible with those of a previous study by Molassiotis and colleagues (2007).

The anxiety levels of patients in the P6 acupressure group and patients in the control group were found to be elevated before wristband application. Intensive and long-term treatments performed on women with breast cancer and the severe side effects of these treatments adversely affect the daily life functions of women and cause various psychosocial problems (Marrs, 2006). Demiralp (2006) conducted a study on patients with breast cancer who were treated with chemotherapy and determined that the mean anxiety scores were elevated before wristband application. In another study investigating changes in the anxiety levels of patients receiving chemotherapy, Alacacioglu et al. (2007) showed that the anxiety levels of women were significantly elevated at the beginning of treatment. The results of our study were found to be similar to the results of previous studies.

The mean anxiety score for patients in our P6 acupressure group decreased after application, and there was a statistically significant difference between the groups. In line with the results obtained from our study, it could be asserted that the decreased occurrence of nausea and vomiting after chemotherapy also decreased anxiety level. The results of numerous studies conducted on cancer patients have determined that anxiety level depends on the severity and intensity of nausea and vomiting after chemotherapy, and that there is a positive correlation between states of nausea, vomiting, and anxiety after chemotherapy (Andrykowski & Gregg, 1992; Molassiotis et al., 2002*a*; 2002*b*; Raghavendra et al., 2007).

Table 3. *Comparison of anxiety mean scores of the pre- and posttest of patients in the experimental and control groups*

	Pretest X (SD)	Posttest X (SD)
Experimental	44.37 (8.49)	37.68 6.38
Control	46.56 (4.10)	44.62 (4.81)
Significance	$t = 1.31$ $df = 62$ $p > 0.05$	$t = 4.90$ $df = 62$ ***p < 0.001***

LIMITATIONS

The results of our study cannot be generalized beyond this study group because the population of our study was restricted to patients with breast cancer who applied to the ambulatory chemotherapy unit at the Atatürk University Research Hospital. More comprehensive studies including different cancer types should be undertaken.

CONCLUSION

Our study was conducted to determine the effect of acupressure on chemotherapy-induced nausea, vomiting, and anxiety in patients with breast cancer.

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We concluded that acupressure applied to acupuncture point P6 using a wristband decreased nausea and anxiety, and that this decrease was statistically significant. Application of acupressure also decreased vomiting and retching, but this decrease was not statistically significant. In light of these results, due to the effectiveness and inexpensiveness of acupressure, along with its ease of use, we suggest that it be employed in conjunction with pharmacological methods for chemotherapy-induced nausea and vomiting prophylaxis.

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