Clinical and Experimental Health Sciences

The Effect of Progressive Relaxation Exercises on Fatigue, Nausea and Vomiting in Patients with Breast Cancer Receiving Chemotherapy

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ABSTRACT

Objective: The research was designed experimentally to evaluate the effectiveness of progressive relaxation exercises (PRE) in the prevention of chemotherapy-induced fatigue, nausea and vomiting in patients diagnosed with breast cancer.

Methods: 50 patients diagnosed with breast cancer received doxorubicin and taxane-based treatment who applied to the chemotherapy unit of a private hospital were participated in the study. 24 patients were included in the experimental group, and 26 patients were included in the control group, who were selected by simple random method and agreed to want to get in the research. The participants in the intevention group were provided with one-to-one relaxation training accompanied by Relaxation Exercises CD of the Turkish Psychological Association before the initiation of treatment. Data were collected using "Patient Identification Form", "Piper Fatigue Scale (PFS)" and "Rhodes Index of Nausea, Vomiting and Retching (RINVR)" forms.

Results: Most of the patients who attended in the research were married (76%) and the mean age was 52.72±10.17. A total of 54% of the participants received doxorubicin-based treatment and 46% of them was on taxane-based treatment. When we investigated the effect of PRE on fatigue, nausea and vomiting, it was found out that fatigue and "nausea, vomiting and retching (NVR) experience, occurrence and distress" scores on the day of treatment were significantly lower than those of the other five days, but there wasn't difference in five-day symptom scores between the groups.

Conclusion: It was concluded that PRE were not an effective approach in decreasing the symptoms of fatigue, nausea, vomiting in the research group patients with breast cancer and receiving chemotherapy.

Keywords: Muscle relaxation, fatigue, nausea, vomiting, chemotherapy.

1. INTRODUCTION

Cancer and cancer-related mortality rates are increasing day by day. According to the World Cancer Report published in 2012 by the "International Agency for Cancer Research (IARC)"; It was determined that 14.1 million people were newly diagnosed with cancer and 8.2 million people died from cancer (1).

Most widespread cause of death in women is breast cancer in the world and in our country. Radiotherapy and surgery are used as local methods to treat breast cancer, but chemotherapy, as a systemic treatment, has a great place and importance. Chemotherapy has many side effects, depending on treatment regimen used. The most widespread side effects are neutropenia, nausea, fatigue, vomiting, costıpation nausea, vomiting, anemia and peripheral neuropathy (2, 3).

Fatigue in patients receiving chemotherapy has an extremely negative effect on quality of life of patients and activities of daily living. "The National Comprehensive Cancer Network (NCCN)" describes fatigue with cancer as "an uncommon, progressive and subjective sense of exhaustion that prevents daily life activites of a person, which occurs due to cancer or cancer treatment". It has been reported in the literature that the prevalenceof fatigue in patients receiving chemotherapy is between 40-100% (4). Fatigue is normally a subjective symptom that increases with activity and goes away after rest. However, fatigue in cancer patients is different. There is fatigue that does not go away after rest, independent ofthe activity (5).

Pharmacological and non-pharmacological approaches are used to manage fatigue. Pharmacological approaches are often used to treat symptoms developing due to fatigue (6). There are studies supporting the effectiveness of psycho-educational approaches (7) and exercise from non-pharmacological approaches. However, it has been emphasized in the literature that energy conservation approaches, sleep, massage and reflexology, relaxation exercises and imagery therapy, music therapy, painting, yoga, acupuncture, hypnosis, reiki and therapeutic touch may be effective but further studies are needed (8).

Other side effects that affect the quality of life and also daily living activities of patients receiving chemotherapy are

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nausea and vomiting. Nausea and vomiting usually begin one to two hours after chemotherapy and last for six to twelve hours. Some patients may experience nausea and vomiting a few days after chemotherapy. It has been reported that the frequency of nausea and vomiting in patients treated with chemotherapy ranges from 66% to 91% (9).

Pharmacological or non-pharmacological methods are also used in the treatment of nausea and vomiting caused by chemotherapy. The effectiveness of antiemetics from pharmacological methods has been proven. It has been emphasized that non-pharmacological approaches such as patient education, music therapy, hypnosis, relaxation exercise, massage, aromatherapy, and yoga, acupuncture, acupressure may also be effective (10).

One of the methods which are recommended for the treatment of chemotherapy-related fatigue and nausea-vomiting, and whose effectiveness is controversial is also progressive relaxation exercises (PRE). PRE is defined as relaxation exercise consisting of stretching and loosening of large skeletal muscle groups, respectively. This exercise is aimed at relaxation to reduce the feeling of tension and the level of perceived stress. It is emphasized that PRE reduces the stimulation of the autonomic and central nervous system and increases the activity of the parasympathetic nervous system (11).

Progressive relaxation exercises are a cost-effective technique that can be easily taught by clinical psychologists, nurses, yoga instructors and other complementary medicine practitioners. Training is carried out in one or several sessions in group or one-to-one with a CD or voice recorder. Relaxation training is recommended before, after or during medical treatment or procedure. Relaxation sessions take 20 to 30 minutes, but this is not a standard time. Muscle groups involved in processing and deep breathing techniques affect this time (11).

There are insufficent studies evaluating the effectiveness of PRE on problems such as pain, anxiety, depression, sleep disorders, nausea, vomiting, fatigue patients with cancer, due to chemotherapy and there is no sufficient evidence. The studies have been reported to be methodologically poor (11). Kwekkeboom et al. indicated in their reserch on 40 hospitalized cancer patients, progressive relaxation exercises were not effective on pain (12). In another study by Isa et al., it was carried out that relaxation exercises had positive effects on anxiety, but the same effect was not observed on depression (13). In a study by Simeit et al., it was determined that the effects of autogenic training and relaxation exercises on sleep were not different (14).

Pathak et al. carried out a study to determine efficiency of PRE on pain and fatigue in 100 participants receiving radiotherapy, and identified that relaxation exercises in combination with standard treatment reduced pain and fatigue (4).

Cancer patients are going through a difficult process either because of the effect of the disease or the side effects of the treatment methods. When advanced, simple, cost-effective and reliable nursing practices such as progressive relaxation training are provided to these patients in addition to standard pharmacological treatment, it is considered that they will increase symptom control and improve life quality.

2. METHODS

2.1. Ethical Considerations

The written permission of "Marmara University Faculty of Medicine Ethics Committee" numbered with 09.2016.540 was obtained. A written consent was obtained from the private hospital where the research was carried out.

Written informed permission was taken from the participants included in the research after explanations were made. Progressive relaxation exercises, standard tretment and standard care were applied to the intervention group. The control group received standard treatment and standard care. The control group was taught progressive relaxation exercises five days after treatment, if desired.

2.2. Patients and Data Collection

This research was designed to evaluate the efficacy of PRE in reducing chemotherapy-induced fatigue, nausea, and vomiting in patients treated with chemotherapy for breast cancer. The research is a randomized controlled trial conducted in a single center. Between March 2017 and February 2018, it was conducted inthe outpatient chemotherapy unit in a private hospital. 50 patients in total who applied to the outpatient chemotherapy units to receive their treatments on the dates specified and were selected by simple random method were included in the sample. 24 and 26 patients were respectively included in experimental and control groups with simple random selection method in accordance with randomization list. According to the power analysis to determine the trial sample (assuming Δ: 0.928, Power:0.80, β: 0.05 and α: 0.05), the sample number of the experimental/control groups was determined as 20 patients for each and 40 in total. Inclusion criteria for the research; to have been diagnosed with breast cancer, to receive Doxorubicin or Taxane-based treatments, to not have a communication problem that would prevent participation in the research, and to wa nt to get in the research after necessary explanation was given.

After the trial was explained and the participant's oral and written permission were obtained, 26 of the participants were get involved in the intervention group and 24 of them were get involved in the control group according to the prepared randomization list. Simple randomization method was used to select patients. The randomization list was created using a computer program for the study. After determining the patients who met the inclusion criteria for the trial, their consent was obtained and they were included in the experimental or control group according to the list. Before initiating treatment in participants in the intervention group, the "Patient Identification Form", the PFS and the RINVR forms were filled in face-to-face interviews and the participant was taken to a quiet place and was

given one-to-one relaxation training throughthe Relaxation Exercises CD of the Turkish Psychological Association. The participant to be given relaxation training was taken to a quiet place and was provided to sit comfortably. She was asked to close her eyes. She was recommended to perform relaxation exercises at least once a day for one week after the end of treatment, and she was given a brochure of relaxation exercises. The PFS and the RINVR forms were given to the participant to fill them in for five days after treatment. The patient interview and training lasted about 30-40 minutes. On the sixth day after the treatment, the participant was contacted by telephone to inquire whether she did regular relaxation exercises. The results of the PFS and RINVR forms were obtained and the telephone call lasted 5-10 minutes. In the first week after chemotherapy, patients were evaluated for five days, as intense fatigue, nausea and vomiting were observed.

After the participant in the control group was informed about the study, she was told that relaxation exercises could be taught at the end of the study if desired, and the participants were taught five days later upon their request. Before initiating treatment in patients, the "Patient Identification Form", the PFS and the RINVR forms were filled in one-to-one. The PFS and the RINVR forms were given to the participant to fill them in for five days after treatment. The interview lasted 15-20 minutes in total. On the sixth day after the treatment, the patient was contacted by telephone and the results of the PFS and RINVR forms were obtained and the telephone call lasted 5-10 minutes. Standard antiemetic treatment was also administered to both groups. Standard antiemetic therapy included 5-HT3 receptor antagonist, NK-1 receptor antagonist, and corticosteroid drugs, depending on the ematogenicity levels of the chemotherapy treatment protocols. Participants were evaluated in a single cure.

2.2.1. Patient Identification Form: The Patient Identification Form, formed in accordance with the literatüre (15, 16) and including important variables related to the study, consists of two parts and twenty-six items including sociodemographic characteristics of the patient and chemotherapy medicines and disease-specific characteristics.

Piper Fatigue Scale (PFS): It was created by Piper et al. (17). The Turkish version of the scale's validity and reliability was carried out by Can. The scale consists of twenty-seven items. Twenty-three of these items are considered as 0-10 point(s) of VAS (Visual Analog Scale) and four items are considered as open-ended. These items are divided into four sub-dimensions, "being fatigue behavior/severity sub-dimension", "affect sub-dimension", "sensory sub-dimension" and "cognitive/mental sub-dimension". Cronbach's alpha (α) reliability coefficient was found to be between 0.92-0.96 for the subgroups and 0.97 for the total scale (18).

Rhodes Index of Nausea, Vomiting and Retching (RINVR): It was created by Rhodes et al (19). The Turkish version of scale's validity and reliability was carried out by Tan and Genc. This scale includes a total of eight items assessing "nausea, vomiting and retching experience", "the incidence of nausea, vomiting and retching", and" nausea, vomiting and retching distress". Responses for each item were classified by using appropriate expressions and scoring the severity of nausea, vomiting and retching experience from 0 to 4. Cronbach's alpha (α) reliability coefficient was found to be between 0.81-0.95 for the subgroups and 0.95 for the total scale (20).

2.3. Data Analysis

A statistical program was used to evaluate the study findings. The "Shapiro Wilks" test was used to evaluate conformity of variables to normal distribution. Descriptive statistical methods (mean, standard deviation, frequency) and "Mann Whitney U" test were used to evaluate quantitative data between two groups. The Friedman test was used for repeated measures analysis. "Wilcoxon Signed Ranks" test was used to evaluate the measurement time that caused the difference. Significance value was accepted as $p< .05$.

3. RESULTS

3.1. Sociodemographic and Disease-Specific Characteristics

Mean age of the patients was 52.72±10.17 and the study was conducted with 50 females. A total of 48% (n=24) of the participants were in the intervention group and 52% (n=26) were in the control group.

In the intervention group, 79.2% (n=19) of the participants were married and 20.8% of them (n=5) were single. Most of the patients (70.8%) were housewives and 37.5% of them were primary school graduates. Generally, non-smokers (54.2%) did not also use alcohol and their income was moderately good (66.7%). Although 70.8% of the patients were not working, 87.5% had health insurance.

Considering the intervention group in terms of disease characteristics, all participants were diagnosed with breast malignant neoplasm. Most of the patients (62.5%) received doxorubicin-based treatment; 37.5% of them were on taxane-based treatment and 95.8% had previous surgical treatment.

In the control group, most of the participants were married (79.2%), 76.9% of the participants were housewives, 53.8% were primary school graduates; most of participants were non-smokers (80.8%) and did not consume alcohol. Of most participants with moderate income (65.4%), 76.9% did not work and 96.2% had health insurance.

If the disease characteristics of the participants in the control group were examined, all patients were diagnosed with breast malignant neoplasm; 46.1% of the patients were on doxorubicin-based treatment, 53.8% of them were on taxane-based treatment and most of them (76.9%) had previous surgical treatment.

The body mass index of the control group was more than the experimental group (p=.001).

Sociodemographic and other disease-specific descriptive characteristics of the groups were similar (p>.05) (Table 1).

Table 1. *Sociodemographic and disease-specific characteristics of patients in experimental and control groups*

Descriptive characteristics		Experimental (n=24)	Control (n=26)	Total (n=50)	Z/χ^2	p
Age (year)	Avg±SD (Median)	50.38±9.92 (50)	54.88±10.09 (55)	*52.72±10.17 (53.5)*	[1]-1.507	.132
BMI (kg/m^2)	Avg±SD (Median)	25.70±3.58 (25.87)	31.23±7.05 (30.12)	*28.59±6.26 (27.87)*	[1]**-3.214**	**.001****
Number of cures (n)	Avg±SD (Median)	2.00±1.02 (2)	2.38±0.90 (2)	*2.20±0.97 (2)*	[1]-1.461	.144
Marital status	Married	19 (79.2%)	19 (73.1%)	*39 (76%)*	[2]0.254	.745
	Single/widow	5 (20.8%)	7 (26.9%)	*12 (24%)*		
Educational background	Elementary school and less	10 (41.7%)	15 (57.7%)	*25 (50%)*	[2]0.721	.396
	Secondary school and higher	14 (58.3%)	11 (42.3%)	*25 (50%)*		
Profession	Housewife	17 (70.8%)	20 (76.9%)	*37 (74%)*	[2]0.028	.867
	Self-employed	7 (29.2%)	6 (23.1%)	*13 (26%)*		
Smoking	Smoker/Ex-Smoker	11 (45.8%)	5 (19.2%)	*16 (32%)*	[2]2.928	.087
	Non-smoker	13 (54.2%)	21 (80.8%)	*34 (68%)*		
Treatment	Doxorubicin-based	15 (62.5%)	12 (46.2%)	*27 (54%)*	[2]0.765	.382
	Taxane-based	9 (37.5%)	14 (53.8%)	*23 (46%)*		

Z: Mann-Whitney U Test *χ^2: Continuity (Yates) Correction and Fisher's Exact Chi-Square Test* **p=.001*

3.2. The Effect of Progressive Relaxation Exercises on Fatigue

When we examined the five-day fatigue levels of the patients with and without progressive relaxation exercises, it was found in both groups that fatigue on the treatment day was lower than that of the other five days (p=.001), but the groups were similar in terms of five-day fatigue scores. (p>.05). It was determined that PRE was not an effective application in reducing fatigue.

As a result of the post hoc comparison, done for the determination of the day on which difference occurred between the groups, it was identified in both groups that fatigue on the first day was less than that of the third day and fatigue on the third day was more than that of the fifth day (p=.001) (Table 2).

Table 2. *Comparison of the effect of progressive relaxation exercises on fatigue in experimental and control groups*

Piper Fatigue Scale		Experimental (n=24)	Control (n=26)	Z	p
		Avg±SD (Median)	Avg±SD (Median)		
Total	Day 0	0.28±0.54 (0)	0.90±1.85 (0)	-0.725	.469
	Day 1	4.44±3.39 (5)	3.12±2.95 (2.5)	-1.460	.144
	Day 2	5.43±3.25 (7)	5.01±3.08 (5)	-0.546	.585
	Day 3	5.62±3.36 (8)	6.22±2.93 (7)	-0.713	.476
	Day 4	5.11±3.15 (5.75)	5.46±3.04 (5.32)	-0.545	.586
	Day 5	4.78±3.11 (4.94)	4.61±2.81 (3.67)	-0.332	.740
	Post-hoc	1*3 3*5	1*3 3*5		
	χ^2	55.184	64.907		
	p	.001**	.001**		

Z: Mann Whitney U Test *χ^2: Friedman Test* **p=.00*

3.3. The Effect of Progressive Relaxation Exercises on Nausea-Vomiting-Retching Experience, Occurrence and Distress

When we examined the five-day "nausea, vomiting, retching experience, occurrence and distress" of the patients with and without progressive relaxation exercises, it was detected that "nausea, vomiting, retching experience, occurrence and distress" on the day of treatment were lower than those of the next five days in the both groups (p=.003; p=.001), but there wasn't difference between the groups in terms of five-day "nausea, vomiting, retching experience, occurrence and distress" (p>.05). PRE were identified not to be an effective approach in reducing "nausea, vomiting, retching experience, occurrence and distress".

Table 3. *Comparison of the effect of progressive relaxation exercises on nausea-vomiting-retching experience, occurrence and distress in experimental and control groups*

Nausea-Vomiting-Retching Experience, Occurrence, Distress		Experimental (n=24)	Control (n=26)	Z	P
		Avg±SD (Median)	Avg±SD (Median)		
NVR Experience	Day 0	0.46±1.28 (0)	1.00±4.20 (0)	-0.466	.641
	Day 1	3.42±5.22 (0)	2.42±5.17 (0)	-1.312	.190
	Day 2	3.54±5.80 (0)	4.65±8.49 (0)	-0.130	.897
	Day 3	3.88±5.64 (3)	5.58±9.10 (0)	-0.220	.826
	Day 4	3.25±5.23 (0)	5.15±8.04 (0)	-0.487	.626
	Day 5	3.46±6.15 (0)	3.12±4.19 (0)	-0.252	.801
	Post-hoc		1*3		
	χ^2	17.749	35.649		
	p	0.003**	0.001**		
NVR Occurrence	Day 0	0.29±0.81 (0)	0.58±2.40 (0)	-0.466	.641
	Day 1	2.13±3.22 (0)	1.42±3.05 (0)	-1.347	.178
	Day 2	2.21±3.54 (0)	2.77±5.13 (0)	-0.163	.871
	Day 3	2.42±3.43 (2)	3.31±5.50 (0)	-0.284	.777
	Day 4	2.04±3.20 (0)	3.00±4.85 (0)	-0.401	.688
	Day 5	2.13±3.59 (0)	1.69±2.22 (0)	-0.077	.939
	Post-hoc		1*3		
	χ^2	17.749	25.649		
	p	.003**	.001**		
NVR Distress	Day 0	0.17±0.48 (0)	0.42±1.79 (0)	-0.466	.641
	Day 1	1.29±2.01 (0)	1.00±2.14 (0)	-1.302	.193
	Day 2	1.33±2.28 (0)	1.88±3.39 (0)	-0.108	.914
	Day 3	1.46±2.23 (1)	2.27±3.63 (0)	-0.179	.858
	Day 4	1.21±2.04 (0)	2.15±3.23 (0)	-0.564	.573
	Day 5	1.33±2.58 (0)	1.42±2.00 (0)	-0.473	.636
	Post-hoc		1*3		
	χ^2	17.749	26.693		
	p	.003**	.001**		

Z: Mann Whitney U Test *χ^2: Friedman Test* **p< .01*

As a result of the post hoc comparison, done for the determination of the day on which difference occurred within the group, it was identified in the control group that "nausea, vomiting, retching experience, occurrence and distress" on the first day were lower than those of the third day (p=.001) (Table 3).

4. DISCUSSION

Exercise, psychotherapy, yoga, acupuncture, aromatherapy, foot bath, reflexology, energy conservation and activity management, training, massage, therapeutic touch are among non-pharmacological methods used in the management of fatigue in patients in patients treated with chemotherapy (8).

Depending on the pharmacological ematogenicity level of the treatment protocol, dopamine receptor antagonists, benzodiazepines, cannabinoids, 5-HT3 receptor antagonists, antacids, NK-1 receptor antagonists, corticosteroids, as well as non-pharmacological methods are most commonly used for the reducing nausea and vomiting caused by chemotherapy (15, 21, 22). According to the guidelines of the American Cancer Society, the use of NK-1 receptor antagonists and corticosteroids in addition to 5-HT3 receptor antagonists is recommended for chemotherapy protocols with high levels of ematogenicity. The use of corticosteroids with palonosetron is recommended for chemotherapy protocols with moderate levels of ematogenicity (23). 5-HT3 receptor antagonists, corticosteroids, NK-1 receptor antagonists used in standard antiemetic protocols depending on the pharmacological ematogenicity levels of treatment protocols were also used to prevent nausea in our study. Methods such as acupuncture, acupressure, acustimulation, electroacupuncture, exercise, ginger, yoga, music therapy, imagery therapy and aromatherapy are also the most commonly used non-pharmacological methods for the reducing of nausea, vomiting (24,25). In this research we investigated the efficiency of PRE in the literature on preventing chemotherapy-induced, nausea, vomiting, fatigue.

There are few researches in the literature, which address the efficiency of PRE on fatigue, nausea, vomiting in patients treated with chemotherapy in our country and abroad, and the results of these studies are controversial (11). Demiralp et al. indicated in their study, evaluating 27 patients with breast cancer to determine the efficiency of relaxation on sleep quality and fatigue, which evaluated the effectiveness of PRE related to chemotherapy-related fatigue and sleep disorders in our country that relaxation exercises improved sleep quality and reduce fatigue (26). In their research on 70 patients diagnosed with breast and colorectal cancer receiving chemotherapy Dogan et al. asked the experimental group to perform progressive relaxation exercises for 20 minutes every day and the patients were followed up for three cycles. Fatigue and depression scores were lower and life quality was higher in the experimental group (27). Dikmen and Terzioğlu's study on 80 gynecological cancer patients showed that progressive relaxation exercises and reflexology reduced pain and fatigue and increase quality of life (28). When we evaluated the efficiency of progressive relaxation exercises on reducing chemotherapy-related fatigue using the Piper Fatigue Scale in our study, it was found that fatigue scores increased, compared to the day of treatment and there was no difference between the groups. In contrast to above-mentioned studies, our study it was determined that PGE was not an effective method in reducing fatigue. We consider that this result arises from the fact that progressive relaxation exercises are not widely used in our society. The groups were found to have a lower total fatigue score on the first day than that of the third day and a higher fatigue score on the third day than that of the fifth day (Table 2). We think the reason is that the effect of chemotherapy medicines was intense in the first week after the treatment and increased towards the third day and gradually decreased at the end of the week.

Considering the studies that evaluated the efficiency of relaxation exercises in preventing chemotherapy-related nausea, vomiting, Soliman et al. indicated in another randomized-controlled research on 74 patients receiving chemotherapy to define the efficiency of PRE on anxiety, nausea, vomiting, that relaxation exercises decreased nausea, vomiting and retching scores (29). In various studies carried out by Carvalho et al., Molassiotis et al. , Gupta et al. , Tian et al. on patients receiving chemotherapy to define the efficiency of progressive relaxation exercises significantly decreased nausea and vomiting levels (9, 30-32). Song et al. carried out a randomized-controlled research on 100 patients with breast cancer, and applied breathing and PRE as well as standard nursing care for the experimental group, while performing only standard nursing care for the control group. Following chemotherapy, side effects (fatigue, nausea, mouth ulcers, acid reflux, cough, pain, anorexia) were detected to be lower in the experimental group (33). Kurt et al. made a research on 49 patients with breast cancer and identified that the severity of symptoms such as pain, nausea, sadness, anxiety, insomnia, shortness of breath, fatigue, anorexia, changes in skin and nails, feeling bad, mouth sores was significantly lower in the intervention group and the severity of all symptoms increased in the control group (34). When we investigated the efficiency of PRE on reducing nausea and vomiting due to chemotherapy using the RINVR, there was little difference between the intervention and control groups in terms of "nausea, vomiting, retching experience, occurrence and distress" scores on the third and fourth days, but this difference was not statistically significant. It was identified in both groups that "nausea-vomiting-retching experience, occurrence and distress" significantly increased compared to those of the day of treatment and there was no difference between the groups. In contrast to above-mentioned studies, our study showed that PRE were ineffective method in decreasing nausea and vomiting (Table 3).

There are also studies in the literature, which address the effectiveness of progressive relaxation exercises, and the results of those researches are in parallel with our research. Arakawa's study on eight Japanese patients receiving chemotherapy showed no difference in the nausea, vomiting

scores between the groups. However, there was a decrease in anxiety scores (35). Young and Nam conducted a study on 74 patients receiving chemotherapy and determined that the participants who applied PRE had lower levels of anxiety and depression., but there wasn't any difference in the levels of nausea and vomiting, fatigue between the both participants (36).

5. CONCLUSION

We determined the efficiency of PRE on nausea and vomiting, fatigue in patients with breast cancer treated with chemotherapy. The research showed that PRE were not an effective approach in decreasing chemotherapy-related fatigue and "nausea, vomiting, retching experience, occurrence and distress" in breast cancer women in this study group. To confirm the effectiveness of progressive relaxation exercises, more research should be conducted on large patient groups following similar metodology.

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