ORIGINAL ARTICLE

Effects of relaxation on self-esteem of patients with cancer: a randomized clinical trial

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Abstract

Background and objectives Cancer is usually associated with decreased self-esteem. Relaxation is one of the most effective methods to promote self-esteem of patients with chronic diseases. Hence, the present study aimed to investigate the effects of relaxation on self-esteem of patients with cancer.

Methods This randomized clinical trial was conducted on 80 patients with cancer. The samples were selected by convenience sampling method and were randomly divided into experimental and control groups. In the experimental group, the patients implemented relaxation techniques once a day for 30 min during 60 consecutive days in addition to receiving routine care, while patients in the control group received only routine care. Before and after the intervention, the Persian version of the Coopersmith Self-Esteem Inventory (CSEI) was completed.

Results After the interventions, significant differences were observed between groups in favor of the relaxation group in total score of CSEI and all its subscales ($P = 0.0001$). In the experimental group, a significant increase in total score and all subscales of CSEI was observed after the intervention ($P = 0.001$), whereas in the control group, a significant decrease was found in all dimensions ($P = 0.001$).

Conclusion The relaxation seems to be potentially effective in promoting self-esteem of patients with cancer. Further studies, particularly randomized clinical trials with higher sample size and more power, are needed to confirm the obtained findings.

Keywords Self-concept · Self-esteem · Neoplasms · Relaxation

Introduction

Cancer is considered as a common disease in most countries, especially in developing countries [1]. Despite the advances in cancer diagnosis and treatment, it can change the mental image and self-esteem of patients due to the unpredictable nature of the disease and its physical and mental complications [2, 3]. Based on the recent investigations, cancer is associated with low self-esteem in most survivors [4, 5].

Low self-esteem was defined as the lack of positive feelings of persons toward oneself and lack of appropriate relationship with others [6]. Thus, a person with high self-esteem has a positive view and can cope with problems with higher potential and motivation [7]. Accordingly, it is essential to use appropriate, low-cost, and novel approaches to increase self-esteem of patients with cancer.

In recent decades, considerable attention has been paid to complementary and alternative medicine (CAM) as a safe nursing intervention in patients with different types of cancer [8, 9]. Today, oncology nurses play an important role in providing supportive care based on CAM in cancer patients in daily clinical practice [8]. According to the recent study in Europe, the use of CAM by nurses for cancer patients was reported to be 9.35% [9]. It was indicated that a high percentage of cancer patients use CAM to improve their perceived impact of disease, locus of control, sense of coherence, self-efficacy, and self-esteem [10–13]. In a randomized control trial on 2120 patients with different types of cancer, it was reported that patients who received chemotherapy along with a program

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based on CAM had a higher level of self-esteem compared with patients who received only chemotherapy [13].

Relaxation is one of the most effective methods in CAM which has been received considerable attention amongst cancer patients in recent years [14–16]. The relaxation means placing in a particular physical and mental state in which both the body and mind should be completely in deep calm and free from stress and contraction. This approach is a non-invasive technique and its implementation does not require specific technology and equipment, as well as time and space [17]. Currently, a large number of studies have shown the beneficial effects of relaxation on self-esteem of patients with different chronic disorders [18–20]. However, limited studies are available on the effects of relaxation on self-esteem of cancer patients [21, 22]. In a pilot study, it was indicated that relaxation training according to the Yoga in Daily Life® system could be a useful intervention for patients with breast cancer who experienced low self-esteem [21]. Also in an uncontrolled study, it was assumed that hypnotic relaxation therapy might improve body image and self-esteem in cancer survivors [22]. To the best of authors' knowledge, no study has yet examined the effects of progressive muscle relaxation on self-esteem in cancer patients. Thus, considering the importance of self-esteem in cancer survivors and relaxation as a non-invasive technique, the current study designed to investigate the effects of a progressive muscle relaxation program on self-esteem of patients with cancer.

Method

Participants

This was a randomized clinical trial study conducted on 80 hospitalized patients with cancer in the Hematology and Oncology Wards of Arak Ayatollah-Khansari Hospital, Iran, from November to March 2015. The inclusion criteria were as follow: (1) being 30–60 years, (2) being conscious, (3) being able to read and write in Persian, (4) having the ability to perform relaxation technique, (5) being diagnosed with stages 2, 3, and 4 of cancer by an oncologist in the last 6 months, (6) having the experience of at least one chemotherapy session, and (7) having no history of mental illness, epilepsy, and other severe physical disorders. Patients were excluded if they experienced unexpected events during the intervention (i.e., death) or were unable to continue the participation in the study.

The sample size was calculated at approximately 12 patients for each group according to a previous study [23]. However, to calculate the standard sample size, we conducted a pilot study on 10 patients. Based on the findings of the pilot study (self-esteem, 39.51 ± 3.40 and 41.36 ± 2.21 in the experimental and control groups), a formula was suggested for

determining the sample size of clinical trials; the sample size was calculated to be 38 patients for each group with a reliability of 95% and a test power of 80%. However, taking into account the probability of sample loss, we recruited 40 patients in each group of the study.

Ethical considerations

The Ethics Committee and the Institutional Review Board of Arak University of Medical Sciences (Arak, Iran) approved the study protocol (No. IR.ARAKMU.REC.1394.79). Also, the study was registered in the Iranian Registry of Clinical Trials (No. IRCT2015070113110N2). Before random allocation, a written informed consent was obtained from the eligible patients. In addition, patients in the control group were eligible for one training session of relaxation at no cost at the end of the study.

Sampling and randomization

Patients were selected by convenience sampling method. First, all of the patients were assessed by an experienced oncologist in terms of inclusion and exclusion criteria. Then, eligible patients were randomly allocated into two equal groups of intervention and control. For random allocation, two cards of number 1 as the intervention group and number 2 as the control group were given to patients and they were asked to choose one of the cards. Accordingly, they were allocated into experimental or control groups based on the selected card.

Intervention

Patients in the experimental group received the relaxation program in addition to routine care, while those in the control group received only routine care over the same time. In both groups, similar routine care was provided by a blinded nurse under the supervision of the assistant oncologist. To provide care, all enrolled patients in the two groups were asked to refer to the participating wards.

The patients in the experimental group were trained on Jacobson's relaxation technique (progressive muscle relaxation and deep breathing) by the main researcher in two 30-min group sessions over two consecutive days. A multidisciplinary research team including a psychologist, a physiotherapist, an oncologist, and two nurses developed the relaxation intervention, and the content of the intervention was validated by three experts in psychology and physiotherapy fields. The content of each session included providing a relaxed environment in a comfortable position and training contraction and loosening of muscles from the head to foot or vice versa, with deep breathing. When the patients learned how to do the relaxation, they performed the technique at home once a day for

30 min during 60 consecutive days. The average time of relaxation technique was considered based on a previous similar study [24]. During the intervention, a researcher contacted all patients in the experimental group to answer the patients' questions about the relaxation technique and remind them to do the correct method of implementation. The patients received a free gift for their participation.

Data collection

Demographic and clinical characteristics were collected using interviews by a researcher-made form, including items about age, gender, marital status, educational level, job status, time since diagnosis of cancer, type of cancer, type of treatment, and cancer staging.

Self-esteem was assessed using the Persian version of the Coopersmith Self-Esteem Inventory (CSEI). This inventory contains four main subscales including general (26 items), social (8 items), familial (8 items), and educational or professional (8 items). In addition, eight items are considered for fake replies and to be a sign of a defensive reaction toward the inventory. The method of scoring is zero (not like me) and one (like me) for most phrases; however, some expressions score in reverse order. In addition to four subscales, it presents a total score which ranges from 0 to 50, and the greater score indicates higher self-esteem [25]. The CSEI has been used frequently, and the validity and reliability of the Persian version of this inventory have been confirmed previously [26]. The inventory was completed by patients before the start of the intervention and at the end of the intervention.

Statistical analysis

All the statistical analyses were conducted using SPSS version 21. The chi-square test was used to assess the homogeneity of groups for demographic and clinical characteristics. The independent samples t test and paired samples t test were employed to compare the self-esteem scores between and within the experimental and control groups. P value < 0.05 was considered to be statistically significant.

Results

Follow-up

Of the 80 randomized patients, all adhered to the study protocol and were included in the final analysis (Fig. 1).

Demographic and clinical characteristics

The differences between the experimental and control groups pertaining to demographic and clinical characteristics are shown in Table 1. No significant differences were found between groups in terms of the characteristics ($P > 0.05$).

Self-esteem

The self-esteem scores of both the experimental and control groups are shown in Table 2. Based on the independent samples t test, no significant differences were observed before the intervention in the total and all subscales scores between the two groups, while a significant difference was found after the intervention in all domains ($P = 0.0001$). According to the paired samples t test, the total and all subscale scores increased significantly after the intervention in the experimental group ($P = 0.001$), whereas in the control group, a significant decrease was found in all domains after the intervention ($P = 0.001$).

Discussion

This study investigated the effects of relaxation on self-esteem of patients with cancer. Based on the findings, the self-esteem scores in the experimental group increased significantly after the intervention, indicating the positive effect of the relaxation. Also, after the intervention, a significant difference was observed between groups in favor of the relaxation group.

Most previous studies have been focused on the effects of relaxation on self-esteem of patients with other diseases, and limited studies are available in patients afflicted by cancer. In a pilot study, the immediate and short-term effects of relaxation training were assessed on self-esteem of patients with breast cancer. The results indicated statistically significant differences between the experimental group (received a group relaxation training sessions according to the Yoga in Daily Life® system to be practiced individually at home for 3 weeks) and control group (received standard physiotherapy for 1 week) in all measured self-esteem scores over the study period [21]. In another study, the effect of a mind-body intervention involving self-directed hypnotic relaxation was assessed on the body image of cancer survivors. The authors concluded that the intervention could improve body image and, consequently, might be effective in improving self-esteem of patients [22]. In patients with heart disease, Avazeh et al. indicated a significant difference after 8 weeks of intervention in the level of self-esteem in the relaxation group compared with that in the control group [18]. Nasiri et al. conducted another study on women with postpartum depression and found that progressive muscle relaxation exercises greatly influence the depression reduction and the self-esteem improvement of patients [19].

Furthermore, several studies have been conducted on the effects of relaxation on other problems of cancer patients such as pain and nausea. Shaban et al. investigated the effect of
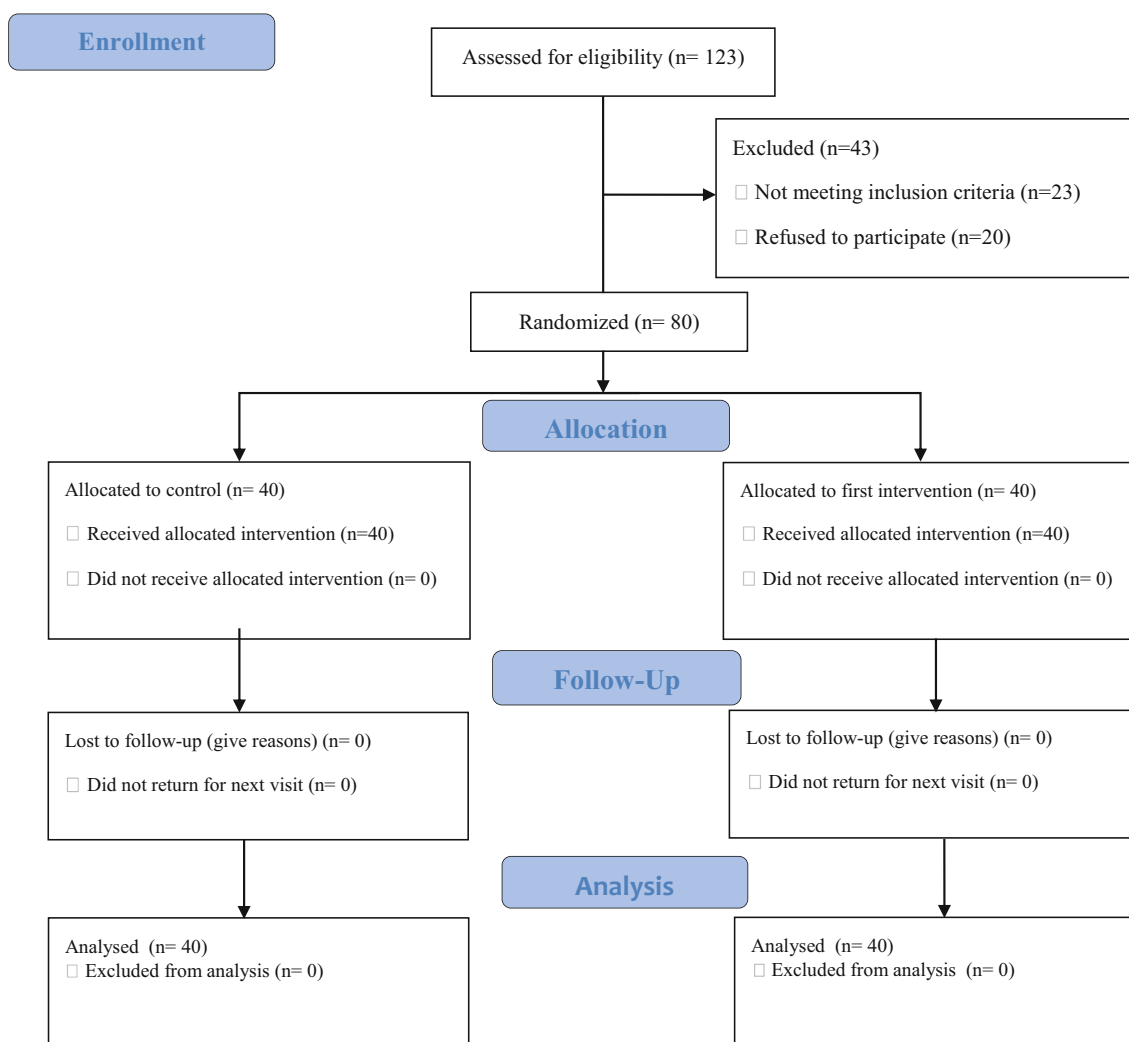
Fig. 1 The CONSORT flow diagram of the patients' recruitment

non-pharmacological ways of muscle relaxation and music therapy on reducing pain of cancer patients. They indicated that relaxation was more effective on pain relief; however, both methods could reduce the pain of patients [27]. In another study, Syrjala et al. found similar results on the positive effects of relaxation on pain relief of cancer patients [28]. In addition, Kapogiannis et al. in a systematic review of randomized controlled trials reported that applying relaxation method could reduce nausea amongst patients undergoing chemotherapy [15]. These studies are consistent with the findings of the current study and confirm the beneficial effects of relaxation on cancer patients.

The strengths and limitations of the study

This research is one of the first attempts to examine the effects of progressive muscle relaxation on the self-esteem of patients

with cancer. Also, we considered the relaxation techniques during a longer period in comparison with previous studies. However, the present trial had some limitations. First, we could not select patients by random sampling methods due to the limited number of patients in the recruitment hospital and also the unwillingness of the patients to participate in the study (because of chemotherapy complications such as fatigue and vomiting). Second, data were collected on a small sample in Iran and from patients aged 30–60 years which might limit the generalizability of the findings. The age range of patients was considered based on the previous experimental studies and also the researchers' experiences (cancer patients aged over 60 years may have more difficulties in answering questions). So that cancer patients less than 30 years and more than 60 years might have less compliance, we excluded these groups of patients to reduce the possible rate of lost to follow-up [29–31]. In a retrospective analysis of patients with

Table 1 Comparison of demographic and clinical characteristics in the control and experimental groups

Variables		Experimental group (n = 40)	Control group (n = 40)	P value[†]
Sex	Female	19 (47.5)	18 (45.0)	0.27
	Male	21 (52.5)	22 (55.0)	
Age (years)	30–40	3 (7.5)	2 (5.0)	0.64
	41–50	7 (17.5)	9 (22.5)	
	51–60	30 (75)	29 (72.5)	
Marital status	Single	1 (2.5)	2 (5.0)	0.27
	Married	39 (97.5)	38 (95.0)	
Educational level	Non-academic	5 (12.5)	36 (90.0)	0.94
	Academic	35 (87.5)	4 (10.0)	
Job status	Unemployed	17 (42.5)	16 (40.0)	0.57
	Employed	23 (57.5)	24 (60.0)	
Time since diagnosis (year)	Less than 1	7 (17.5)	7 (17.5)	0.78
	1–2	10 (25.0)	12 (30.0)	
	More than 2	23 (57.5)	21 (47.5)	
Type of cancer	Leukemia and lymphoma	29 (72.5)	25 (62.5)	0.85
	Other cancers (i.e., breast, digestive system)	11 (27.5)	15 (37.5)	
Type of treatment	Chemotherapy	12 (30.0)	12 (30.0)	0.10
	Radiotherapy	1 (2.5)	1 (2.5)	
	Surgery	1 (2.5)	1 (2.5)	
	Multimodality	26 (65.0)	26 (65.0)	
Cancer staging	2	7 (17.5)	5 (12.5)	0.66
	3	20 (50.0)	19 (47.5)	
	4	13 (32.5)	16 (40.0)	

Data were presented as number (percent)

[†] Chi-square test

cancers, the percentages of noncompliant patients in the age groups < 30, between 30 and 60, and > 60 years were 25.0%, 17.4%, and 25.5%, respectively [31]. Third, the findings might be affected by recall bias and some of confounding

Table 2 Comparison of self-esteem within and between the experimental and control groups before and after the intervention

Self-esteem		Before the intervention Mean ± SD	After the intervention Mean ± SD	P value[†]
Total	Experimental	37.75 ± 4.47	41.40 ± 2.75	0.001
	Control	36.32 ± 5.21	32.0 ± 5.54	0.001
	P value[††]	0.51	0.0001	
General	Experimental	18.92 ± 2.98	21.25 ± 2.43	0.001
	Control	18.97 ± 3.98	17.07 ± 3.22	0.001
	P value[††]	0.94	0.0001	
Familial	Experimental	5.67 ± 0.91	6.72 ± 0.59	0.001
	Control	5.77 ± 1.14	5.05 ± 0.95	0.001
	P value[††]	0.66	0.0001	
Social	Experimental	5.57 ± 1.05	6.72 ± 0.55	0.001
	Control	5.90 ± 0.87	5.00 ± 1.01	0.001
	P value[††]	0.13	0.0001	
Professional	Experimental	5.5 ± 0.87	6.65 ± 0.66	0.001
	Control	5.77 ± 0.94	4.87 ± 1.09	0.001
	P value[††]	0.18	0.0001	

[†] Independent samples t test

[††] Paired sample t test

variables such as educational level as the number of academic patients was higher in the experimental group compared with that in the control group. However, random allocation was used to limit some of these variables. Forth, the relaxation was done at home by patients and careful monitoring was not possible by the researchers. However, we tried to make sure that techniques were done with daily phone call and encouragement of patients. Fifth, we used routine care control group design, which might lead to a significant difference in the amount of attention received by the patients in each group.

Conclusion

The relaxation program seems to be effective in improving self-esteem of patients with cancer. Further studies, particularly randomized clinical trials with higher sample size and more power, are needed to confirm our findings. In addition, we suggest that future studies examine the effect of relaxation on other symptoms and complications of cancer.

Compliance with ethical standards

The Ethics Committee and the Institutional Review Board of Arak University of Medical Sciences (Arak, Iran) approved the study protocol (No. IR.ARAKMU.REC.1394.79). Also, the study was registered in the Iranian Registry of Clinical Trials (No. IRCT2015070113110N2). Before random allocation, a written informed consent was obtained from the eligible patients.

Conflict of interest The authors declare that they have no conflict of interest.

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