

Original Article

Effect of Benson's Relaxation Technique on Anxiety in Family Caregivers of Patients with Cancer: A Randomized Controlled Trial

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ABSTRACT **Background:** Family caregivers of patients with cancer experience high levels of anxiety and mental health problems. Relaxation methods have seldom been used in these caregivers. **Objectives:** This study tested the effect of Benson's relaxation method (BRM) on state anxiety in family caregivers of patients with cancer. **Methods:** A randomized controlled trial was conducted on 50 primary family caregivers of patients with cancer. Family caregivers were randomly assigned to a control group and an experimental group, each group consisted of 25 people. In the experimental group, the subjects were trained to practice the BRM at home, once a day for 6 weeks. Family caregivers' anxiety was measured at the start of the study and at the end of the 6th and 10th weeks by using Spielberger's State Anxiety Inventory (i.e., form $y-1$). The data were analyzed using descriptive and inferential statistics such as the Fisher's exact, independent samples t , and Mann-Whitney U tests as well as the repeated-measures analyses of variance. **Results:** No significant difference was found between the mean baseline state anxiety of the control and experimental groups ($P = 0.329$). However, during the study, the mean anxiety was decreased in the experimental group, whereas it did not significantly change in the control group. The repeated-measures analysis showed that BRM could significantly reduce the mean state anxiety ($P < 0.001$) over time. **Conclusion:** Regular use of BRM for 6 weeks could decrease the mean scores of state anxiety in family caregivers of patients with cancer. Nurses and other healthcare providers are suggested to teach BRM to the family caregivers of cancer patients and advise them to use this method regularly for the reduction of their own anxiety.

KEYWORDS: Anxiety, Benson, cancer, caregivers, relaxation

INTRODUCTION

Cancer is increasingly a global health issue, with 1,688,780 new cases and 600,920 deaths reported in the United States in 2017.^[1] It is anticipated that the incidence of cancer in Iran will increase from 84,800 in 2012 to 129,700 in 2025.^[2] The diagnosis of cancer has emotional impacts on the patient's family caregivers. A study reported a high prevalence of mood disorders in family caregivers of patients with cancer.^[3] A study in Korea also reported that, respectively, 38.1% and 82.2% of family caregivers of patients with cancer experienced symptoms of anxiety and depression.^[4] No study from Iran is available on the prevalence or the level of anxiety in family caregivers of patients with cancer; however, a

study of the burden of care in families of cancer patients reported that these families experience high levels of caregiver burden, and the highest caregiver burden occurs in the patients' spouses so that the mean burden in the patients' spouses was five points higher in comparison with other caregivers.^[5] A study also reported that partners

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of patients with cancer experience more distress and anxiety than patients.^[6]

Medication is often used to treat anxiety. However, the medicines used usually cause side effects such as nausea, insomnia, irritability, weight gain, drowsiness,^[7] decreased consciousness, sexual dysfunction, and drug dependence.^[8] These problems have caused interest in using non-pharmacological methods to reduce anxiety.^[9] Counseling^[10] and teaching adaptive methods such as problem-solving,^[11] music therapy,^[12] and relaxation methods^[13] are among the non-pharmacological methods used to relieve mental health problems in different patients and their caregivers.

There are several methods for relaxation including progressive muscle relaxation, diaphragmatic breathing, autogenic training, and Benson's relaxation method (BRM).^[14] Among these methods, BRM is among the most frequently used and simple methods. Some studies have shown that relaxation methods can reduce anxiety^[15] and improve the quality of life^[16] of hospitalized and community-dwelling patients. However, these methods have seldom been used in family caregivers of patients, especially in family caregivers of patients with cancer. The few studies that examined these methods in family caregivers have also reported inconsistent results. For example, a study has found that muscular relaxation can decrease the anxiety of parents of children with leukemia receiving chemotherapy.^[17] Yet, another study assessed the impact of progressive muscle relaxation with and without music on the anxiety of family caregivers of hospice patients and concluded that though both methods reduced anxiety, however, the difference between caregivers in the control and intervention groups was not statistically significant.^[12] A systematic review also reported that most studies that implemented the relaxation methods in patients with anxiety have methodological weaknesses, and the data on the effectiveness of relaxation techniques in anxiety are not convincing.^[18]

Objectives

Due to the lack of adequate studies on the effect of BRM on anxiety in family caregivers of patients with cancer, this study aimed to investigate the effect of BRM on state anxiety in family caregivers of patients with cancer.

METHODS

A randomized controlled trial was conducted in 2019, on a sample of family caregivers of patients with cancer who referred to three oncology centers in Isfahan

Province, Iran. The sample size was estimated using the results of a former study on the effect of an enhanced caregiver training program on the psychological well-being of caregivers of patients with cancer. The mean post-intervention anxiety of the experimental and control groups was 45.68 ± 6.67 and 51.69 ± 6.70 , respectively.^[19] Then, considering a possible dropout of 25%, the needed sample size in each group was estimated at 25. Type I and II errors were considered 0.05 and 0.2, and the S_1 , S_2 , μ_1 , and μ_2 were considered as 6.67, 6.70, 45.68, and 51.69, respectively.

Eligibility criteria were caring for a patient with cancer at the time of the study, age between 20 and 59 years, the ability to read and write in Persian, receiving no anxiolytic medications at the start and during the study, no history of the known cognitive and muscular disorder, having mild or higher levels of anxiety based on the scores of the Spielberger's State Anxiety Inventory (SAI) (i.e., a score of 21 or over), and an inclination to take part in the study. Exclusion criteria were a subject's decision of withdrawal, getting an acute disease or special conditions requiring medical care, death of the caregiver or patient, the occurrence of critical stresses such as caregiver's divorce during the study, and omitting at least two sessions of the intervention per week.

Before data collection, a permuted block randomization schedule was prepared using an online number generator (i.e., <https://www.sealedenvelope.com/simple-randomiser/v1/lists/>), and the supposed subjects were randomly assigned 10 blocks (i.e., 5 blocks of 4 and 5 blocks of 6) to be allocated to a control or an experimental group, 25 in each group [Figure 1]. Then, the main family caregivers of cancer patients who met the eligibility criteria were successively enrolled and allocated into the study groups according to the randomization schedule.

Intervention

The first researcher was trained on BRM at a special center in Tehran, Iran. Then, referring to the oncology and chemotherapy departments of Shahid Beheshti and Yathribi Medical Centers of Kashan and Seyed Al-Shohada Hospital of Isfahan, she found the family caregivers of patients with cancer, informed them on the study purpose and procedures, and requested them to take part in the study. When each caregiver agreed to take part in the study, study questionnaires were given to him/her to be answered in a silent and private setting. If needed, the investigator read the questions to low-literate subjects and recorded their answers in

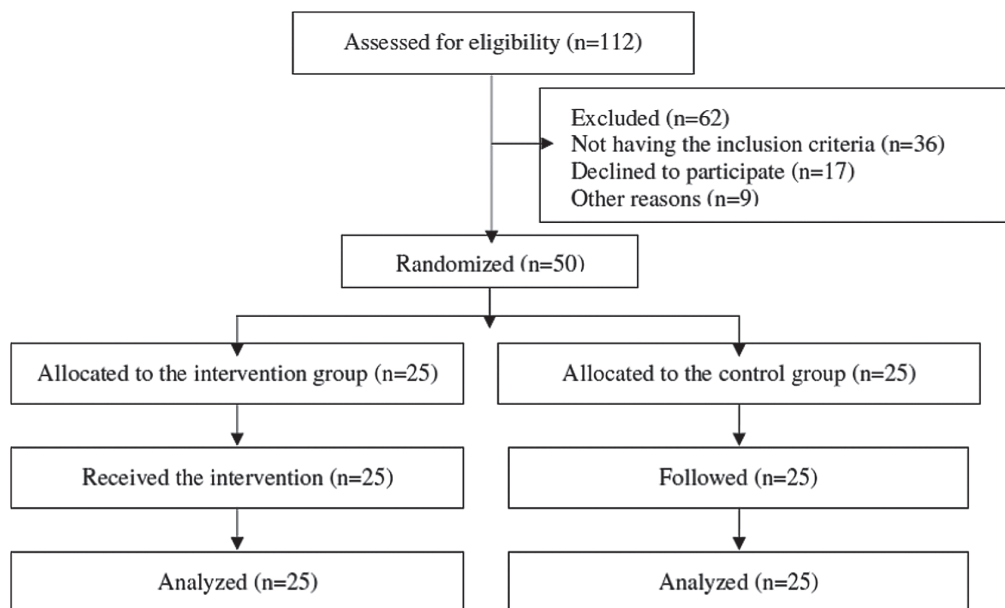


Figure 1: The study flow diagram

the questionnaire. The investigator then educated BRM to the participants allocated to the experimental group, requested them to repeat it once in the presence of the investigator, and their problems were resolved. The subjects were then requested to practice the procedure once a day (preferably around the evening), for 6 weeks, in a private and calm setting. All the training sessions were held individually and in a private and calm room in the aforementioned hospitals.

The BRM was taught to the subjects as follows: wear comfortable, loose-fitting clothing. Lie down or sit quietly in a comfortable chair. Close your eyes gently. Deeply relax all your muscles, start from your feet and gradually progress up to your arms, torso, neck, and face. Keep them loose and relaxed. First, loosen your feet from the ankles and just think that your feet are completely loose from the ankles. Stay in this state for a while. Meanwhile, breathe slowly, regularly, and deeply through your nose. Be aware of your breathing. As you exhale through your mouth, keep soothing words (such as god, love, rain, rainbow, etc.) in mind. Then do the same for the legs, thighs, wrists, forearms, arms, shoulders, torso, and neck. Continue for about 20 min. When you completed the procedure, sit quietly for several minutes, at first with your eyes closed and later with your eyes opened. Do not stand up for a few minutes.^[13,16] At the end of the 6th and 10th weeks, subjects in the experimental and control groups were again invited to the hospital or where possible for them to answer the questionnaires again. During the intervention, the subjects in the experimental

group were called every other day and reminded about the technique. An audio file guiding BRM was also provided to the subjects in the experimental group. The control group did not receive any training on BRM. The experimental group was also asked not to teach the technique to anyone during the study. Family caregivers in the experimental group and the investigator were both aware of the type of intervention. Therefore, the study was not blind.

Data collection instruments

A two-part instrument was used to collect the study data. The first part consisted of demographic characteristics such as age, sex, job, kinship with the patient, time passed from marriage (for patients' spouses), education level, co-morbid disorders, financial status, place of residence, having a personal vehicle, type of the patient's cancer, the duration of cancer, the type of cancer treatment, and time passed from having a caregiver role. The second part of the instrument was the Spielberger's SAI (i.e., form $\gamma-1$).

The SAI consists of 20 items on a four-choice Likert scale from "not at all = 1" to "very much = 4," with the total score ranging from 20 to 80. Higher scores indicate higher anxiety. Scores between 0 and 20 are considered as no anxiety, and scores from 21 to 40, 41–60, and 61–80 are considered as low, moderate, and severe anxiety, respectively. The validity and reliability of the SAI were confirmed by a former study, with a reliability coefficient of 0.94.^[20]

Ethical considerations

The study protocol was approved by the Ethics Committee of Kashan University of Medical Sciences, Kashan, Iran (code: IR.KAUMS.NUHEPM.REC.1398.013) and was registered in the Iranian Registry of Clinical Trials (code: IRCT20100403003618N7). Consents were also sought from the officials in the aforementioned hospitals. Written informed consent was obtained from all subjects. The study aims were explained to them, and they were assured about the data confidentiality. All the subjects were also assured that their participation is voluntary, and they can withdraw from the study.

Data analysis

Data analysis was performed using the SPSS software v. 16.0 (SPSS Inc., Chicago, IL, USA). The normality of the data was assessed via the Kolmogorov–Smirnov test. Descriptive statistics (frequency, percentage, mean, standard deviation) were used to calculate the frequency and percentage and mean of some individual characteristics of caregivers. The χ^2 , the Fisher's exact, the independent-samples t , and the Mann–Whitney U -tests were used for between-group comparisons. Also, the repeated-measures analysis was used to compare the variations in the mean anxiety scores through the three subsequent measurement time points, and the Ginsenhauer–Geisser test was used to correct the degree of freedom. P -values less than 0.05 were considered significant.

RESULTS

All the subjects completed the study, and none of them reported an adverse effect during the study. Most of the family caregivers were females (90%) and a majority of them were the patients' spouses (24%). The mean age of the family caregivers was about 38 years, most of them were unemployed (66%), and reported an income adequate for their expenditures (58%). Most of the patients who cared for had gastrointestinal cancer (52%) and were receiving chemotherapy (82%). A majority of the family caregivers usually used methods such as reliance on god, praying, and crying to god to reach a quiet state. No significant difference was found between the study groups in terms of their demographic characteristics ($P > 0.05$) except for education level and kinship with the patient [Table 1].

In the repeated-measures analysis, Mauchly's test illustrated that sphericity was not assumed [$\chi^2(2) = 25.034$; $P < 0.001$], then the Greenhouse–Geisser test was used and showed that BRM could significantly decrease the mean state anxiety over time [$F = 20.926$, $df = 1.415$, $P = 0.001$, Table 2]. However,

an interaction was observed between time and the intervention ($F = 31.321$, $df = 1.415$, and $P = 0.001$). Given the observed interaction, the t -test was used for the comparison between the two groups at different times. The results revealed that the mean baseline state anxiety was not significantly different between the two groups ($P = 0.329$); however, the between-group differences were statistically significant both at the end of the 6th and the 10th weeks [$P < 0.0001$; Table 2 and Figure 2].

DISCUSSION

This study showed that all of the family caregivers of patients with cancer had moderate anxiety at the start of the study. However, though the mean anxiety of the control group increased a bit during the study, the experimental group experienced a declining trend in their anxiety during the study. The maximum reduction in anxiety of the experimental group (i.e., 16.48 point) happened at the end of the 6th week and then continued to decrease by 1.76 more points at the end of the 10th week. As a result, this group experienced low anxiety at the end of the study.

Congruent with our results, several studies reported the beneficial effects of BRM or other relaxation techniques on different groups of healthy people^[21,22] or patients.^[23,24] A number of studies have also reported the valuable effects of relaxation methods on the quality of life in caregivers of patients with multiple sclerosis^[25] and children with chronic disorders.^[16] A study reported that relaxation could alleviate the anxiety in family caregivers of hospice patients.^[12] Nonetheless, only one study was found on the effect of relaxation methods on family caregivers of patients with cancer and reported that relaxation could decrease the mean anxiety in parents who had children with leukemia.^[17] Conversely, Kurniasari *et al.*^[26] have reported that practicing BRM for 2 weeks was not effective on anxiety in patients receiving hemodialysis. Anxiety is a widespread and annoying symptom in family caregivers of patients with incurable disorders such as cancer. It has been shown that spouses and family caregivers of patients with cancer are more anxious than patients. They not only have to take care of their patient but also are worried about the course of the disease and the destination of a loved one.^[6,27] It has reported that more than 60% of family caregivers of patients with cancer have moderate-to-severe anxiety.^[4] This increases their burden of caring, disrupts their normal functioning, threatens their mental health, and causes them to become physically and mentally exhausted.^[5,12,28,29] Therefore, relaxation

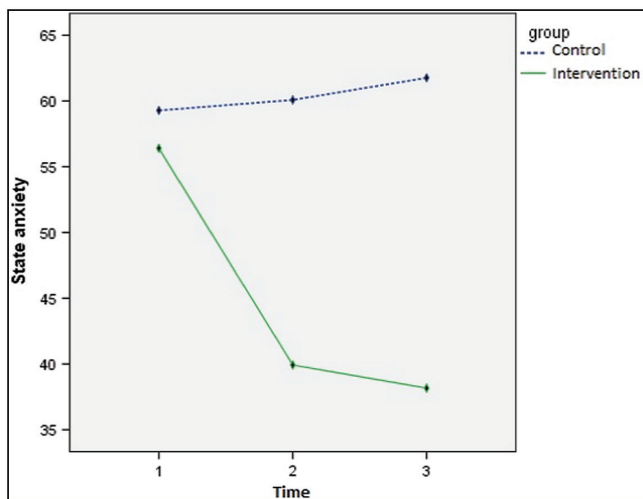
Table 1: Comparison of the personal characteristics of the caregivers of the experimental and control groups

Variable	Group		P-value
	Experimental n (%)	Control n (%)	
Sex			0.99 ^a
Female	23 (92)	22 (88)	
Male	2 (8)	3 (12)	
Education level			0.036 ^b
Low literate	5 (20)	5 (20)	
High school diploma	16 (64)	8 (32)	
Academic	4 (16)	12 (48)	
Being employed			0.37 ^b
Yes	7 (28)	10 (40)	
No	18 (72)	15 (60)	
Kinship with patient			0.003 ^a
Mother	7 (28)	1 (4)	
Father	1 (4)	2 (8)	
Spouse	9 (36)	3 (12)	
Child and sister	8 (44)	19 (76)	
Having comorbid disorders			0.99 ^a
Yes	11 (44)	11 (44)	
No	14 (56)	14 (56)	
Financial status			0.65 ^b
Less than expenditures	10 (40)	9 (36)	
Equal to expenditures	14 (56)	15 (60)	
More than expenditures	1 (4)	0	
Place of residency			0.55 ^a
Personal	15 (60)	18 (72)	
Rental	10 (40)	7 (28)	
Having a personal car			0.76 ^a
Yes	15 (60)	17 (68)	
No	10 (40)	8 (32)	
Type of the patients' cancer			0.12 ^b
Gastrointestinal	12 (48)	14 (56)	
Urogenital	3 (12)	4 (16)	
Hematologic	7 (28)	1 (4)	
Other types	3 (12)	6 (25)	
Type of cancer treatment			0.61 ^b
Chemotherapy	21 (84)	20 (80)	
Surgery/transplantation	2 (8)	1 (4)	
Radiotherapy or combined treatments	2 (8)	4 (16)	
Method usually used for reaching a peaceful state			0.93 ^b
Reliance with god/prayer/crying	15 (60)	14 (56)	
Sleep/loneliness	5 (20)	6 (24)	
Exercise/reading/recreation	5 (20)	5 (20)	
Age, year (mean±SD)	38.44±9.96	37.52±9.99	0.74 ^c
Time passed from marriage, year (mean±SD)	7.96±13.14	2.72±9.40	0.11 ^d
Time passed from possessing a caregiver role, month (mean±SD)	20.76±23.02	27.56±24.24	0.90 ^d
Duration of cancer in patient, month (mean±SD)	20.72±23.01	27.64±32.21	0.38 ^d

^aFisher's exact test^bChi-square test^ct-test^dMann-Whitney U-test

Table 2: Comparison of the mean state anxiety scores of the experimental and control groups during the study

Time	Group	P-value (t-test)	P-value (repeated measures)	P-value (interaction)
	Experimental (n=25)			
	Control (n=25)			
	Mean±SD			
Baseline	56.40±10.12	59.28±10.52	0.329	0.001
At the end of the 6th week	39.92±8.66	60.08±10.88	0.0001	
At the end of the 10th week	38.16±8.27	61.76±10.38	0.0001	

**Figure 2:** Trend of state anxiety scores over the three measurement time points

methods such as BRM can be taught to the family caregiver of patients with cancer. However, these caregivers should be thought that the method would perhaps be more efficient if regularly be used.

Caregivers' preoccupation with the potential and actual consequences of illness, confinement at home or in the hospital, and staying away from social activities due to full-time involvement in caring for the patient, and a feeling of lack of support can all contribute to making them anxious. The present study showed that BRM—if performed regularly—is beneficial for reducing the intensity of anxiety in caregivers of patients with cancer. Hence, it is suggested that nurses teach this method to family caregivers of patients with cancer and recommend them to exercise it regularly.

This study was not blind, therefore, further studies with blind designs are recommended. The current study was also conducted on a small sample of family caregivers of patients with cancer. Hence, nurse researchers are suggested to replicate the study on a larger sample, with a longer duration, and also with a longer follow-up period. The experimental group not only received the teaching of BRM but also telephoned every other day

that may cause this group to experience less anxiety. Future studies are recommended to have telephone conversations (about something other than BRM) with caregivers in the control group.

CONCLUSION

The current study showed that using the BRM for 6 weeks could decrease the mean scores of state anxiety in caregivers of patients with cancer. Healthcare providers are suggested to teach this method to the family caregivers of patients with cancer and advise them to use it to alleviate their anxiety and improve their quality of life. Nursing educators are also recommended to teach the results of this study to their students in addition to the usual methods of treating anxiety and to emphasize the place of relaxation methods such as the BRM in the improvement of the mental health of patients with cancer and their family caregivers.

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Conflicts of interest

There are no conflicts of interest.

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