Original Article

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The Effects of Humor Therapy on the Fatigue in Breast Cancer Patients Undergoing External Radiotherapy

M. Rad (MSc)[1], F. Borzoee (BSc)*[1], S. Shahidsales (MD)[2], Y. Tabarraie (MSc)[1], F.Varshoee-Tabrizi (MD)[3]

1-Faculty of Nursing & Midwifery, Sabzevar University of Medical Sciences, Sabzevar, I.R.Iran
2-Solid Tumor Treatment Research Center, Mashhad University of Medical Sciences, Mashhad, I.R.Iran
3-Reza Radiotherapy Oncology Center, Mashhad, I.R.Iran

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ABSTRACT

BACKGROUND AND OBJECTIVE: Cancer-Related Fatigue (CRF) is one of the most common symptoms reported among women with breast cancer and is the most prominent side effect of cancer treatments. This complication leads to a number of problems in the patient. The aim of this study was to determine the effects of humor therapy on the fatigue in breast cancer patients undergoing external radiation therapy.

METHODS: This study was a clinical trial with parralel planning and before and after. The experiment was conducted on 58 cancer patients receiving radiation therapy in 5 weeks -from the beginning of July 2013 until early October 2013 for a period of 3 months. The research was assigned to two groups of humor therapy and control group (each group consisting of 29 subjects who were randomly assigned to their group). The patients in the experimental group attended the humor therapy sessions twice a week for a month (a total of 8 sessions). The sessions were held using approaches like playing comedy clips, telling jokes and taking part in fun games. Fatigue questionnaires were completed at the end of the first, second and the fifth week as the post-test. The control group patients received routine care. Ultimately, the two groups were put to comparison.

FINDINGS: Fatigue in the laughter therapy group rose from 0.93±0.74 in the first week to 3.36±1.35 in the fifth. In the control group, on the other hand, it went from 1.01±0.96 in the first week to 7.29±2.67 in the fifth week (p=0.001). Thus, fatigue in the first, second, third, fourth and the fifth week was of significant statistical difference. (p=0.001).

CONCLUSION: The results of this study indicated that humor therapy is largely effective in reducing cancer-related fatigue. The health system could enhance cancer patients' well-being and improvement by providing them with a delightful, joyous environment.

KEY WORDS: Humor, Cancer-Related Fatigue, External Radiation Therapy, Breast Cancer.

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Introduction

Breast cancer is known to be the most common cancer among Iranian women (1). In a study done by Tayebi and his colleagues, breast cancer with frequency of 41.4%, has been the most prevalent of cancers among Iranian women between the years 2000 and 2009 (2). Cancer-Related Fatigue (CRF) has been

* **Corresponding Author; F. Borzoee (BSc)**
Address: Faculty of Nursing & Midwifery, Sabzevar University of Medical Sciences, Sabzevar, I.R.Iran.
Tel: +98 51 44446070
E-mail: borzoee75026@yahoo.com

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reported to be one of the most prominent symptoms (60-90%) among the women with breast cancer who undergo radiation therapy. By the definition given by the National Comprehensive Cancer Network (NCCN), CRF is a an unpleasant, subjective, resistant symptom which appears in case of physical, emotional or cognitive fatigue. Upon emergence, CRF can interfere with normal functions of the cancer patient as well as the any ongoing treatments (4).

CRF occurs due to the waste generated by the destruction of tumor cells (5). This type of fatigue cannot be relieved by rest or sleep. It is characterized by the gnawing of the physical strength, reduction in activities and energy level and major depression. In a qualitative study, cancer patients described CRF as long, severe and intolerable with a sudden onset as well as enormous energy loss. They attributed the adverse effects of the fatigue to different aspects such as physical, mental, social and cognitive distress. All paticipants in this study mentioned that the fatigue caused by cancer is a different experience than any kind of normal fatigue (7). Certain disorders caused by CRF are anxiety, depression, sleep disorders, lack of concentration, memory loss and eating disorders such as anorexia (8). A systematic review in this regard revealed a direct link between depression and anxiety related to the fatigue (9). In recent years, the idea that laughing and humor brings about beneficial effects for health is growing. For instance, clowns and humorous activities promoted by doctors or nurses is indicative of it (10). Regarding the helpful effects of laughther, it has been over 30 years that it is being used for the prevention and treatment of many diseases (11). In accordance with the definition of the American Association of Therapeutic Humor, laughter therapy consists of any humorous intervention leading to health promotion and well being (12). Humor therapy is a benefical nursing action in enhancing the health of cancer patients. Christie and colleagues believed that laughther is an effective nursing intervention for cancer patients. Using humor and jokes helps reduce anxiety and discomfort as well as elevate the pain treshold in cancer patients. Furthermore, humor therapy allows patients to express their fears and concerns in an easier way. For another thing, laughther strenghtens the immune system by boosting the function of natural killer cells. (13). Harold believed that laughter and humor heighten the quality of life in general and better life quality helps people live longer. Of all the members of every medical team, nurses spend the most time with the patients and thus, they are the key intervention mediums provided that they themselves are constantly spirited and jubilant (14). Humor therapy, laughter yoga and laughter clubs are each seeking therapeutic results through their promotional programs (15).

In such therapies, a variety of techniques are used in order to make patients laugh; for instance, playing comedy movies, fun games and the like (16). In their research, Berk et al. showed that watching a 60-minute comedy could strenghthen the immune system to a great extent (17). Despite the fact that researchers have been studying the effects of laughter on some dimensions of cancer treatment, for instance its influence on the immune system, they have not yet come up with the exact effects humor can have on CRF. Humor is a simple and cheap nursing intervention which, unlike many treatments and nursing cares, is acceptable in every culture and place (18,16). Conducting studies which reveal the effects of laughter and humor on CRF patients are essensial. This study was done so as to investigate the effects of humor therapy on fatigue in breast cancer patients undergoing radiation therapy.

Methods

This was a clinical trial study conducted on two groups (registration number :IRCT: 1N2013052313441). It was done with parallel design and before and after. It was considered as outpatient treatment for the women with breast cancer who referred to Reza (AS) Oncology and Radiotherapy Center in Mashhad, Iran for radiation therapy from the beginning of the year 2013 until October 2013. The experiment lasted for a period of 3 months. Inclusion criteria included: female gender, radiation dosage being 50-60 Gray (5000-6000 Rod) during the treatment, cancer stage 0-III, age 18 to 70 years, history of breast surgery, Mastectomy or lampectomy, having past at least two weeks since the end of last chemotherapy in case of any, prescribed course of treatment for at least 5 weeks of radiation

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and having past a week since the last radiation therapy and finally, having hemoglobin more than 8gr/dl.

Exclusion criteria included: mental disorders or being involved with any other diseases characterized by fatigue (Multiple Sclerosis, Fibromyalgia, Aids, Rheumatoid Arthritis), Having conditions that laugh may lead to problems such as hernia, advanced hemorrhoid, heart disease with chest pain of angina, Uterine Prolapse, pregnancy, Glaucoma, severe cold or flu and finally, the factors that are associated with fatigue like complaining of severe chronic pain, having sleep disorders and nausea. Thus, those patients fitting the inclusion criteria or the ones with a lower level of Hemoglobin than 8 g/dl were excluded. Research units were selected, using blocked randomization, they were placed in the two groups of humor therapy and usual care. In each block, there were 3 codes of 1 and 3 codes of 2 as unique. Eventually, 15 blocks remained. The blocks were selected randomly and with a blindfold so that each block could be removed upon use and the next one would be selected again randomly.

With each block, the order of entry to either the intervention or the control group was determined. For instance, block 122112 meant that the first, forth and the fifth person would enter the intervention group and the second, third and the sixth person would enter the control group respectively. The samples were calculated with Confidence level of 95% and power analysis of 90% for 29 subjects in each group. After selecting the samples, lack of psychiatric problems like low mood in the subjects were confirmed in the research units during a counseling session with the Reza (AS) Center psychologist. Furthermore, necessary explanation was given to the participants about the research objectives and methods as well as the random choice of the participants in both the humor therpay and the control group. The subjects were also informed on how to respond to the demographic data questionnaire and the Fatigue Symptom Inventory (FSI). During the study, 4 subjects in the humor therapy group and 5 in the control group had to be excluded for reasons like illness, fatigue, having difficulty gathering at a time or unwillingness to continue the study.During the study, sampling continued until the completion of the sample size. Ultimately, a total of 29 patients remained in either the humor therpay or the control group. The patients who met the inclusion criteria participated in sessions and new people regularly joined the group. The fourth session for some people was the first for the others The activities were specific to each session, so that; each person would experience the same process. Each group of humor therapy, depending on the number of the people, was composed of small numbers up to 15 people. Demographic data questionnaire was completed by the researcher based on the data files. Demographic variables were age, education, type of residence, marital status, economic status, family support, body mass index (BMI), menopausal status, amount of exercise, sleep patterns, social role, family history of the disease, tumor stage, the hemoglobin, medications and breast surgery.

Depending on the total dose of radiation, the patients received radiation 5 days a week for a period of 5 or 6 weeks. For another thing, the patients took a rest 2 days a week not receiving any radiation. Before starting the treatment, the patients in both groups completed a self-report questionnaire as well as a fatigue signs test at the end of the first week of their radiation therapy. The questionnaire was completed on a particular day of the week for 5 weeks (including the week before the test) under the supervision of the investigator. Thus, provided with all the required facilities, humor therapy sessions were held in the auditorium of Reza (AS) Center. Due to the emergence of fatigue a week after the radiation therapy (5), the patients participated in the humor therapy sessions twice a week, each time for 60 minutes since the second week after their radiation therapy. The sessions were held and managed by the researcher in charge. Interventions were conducted using three methods: playing humorous video clips (30 minutes), delightful and fun competitions with funny prizes (15 minutes) and telling jokes (15 min). The patients had active participation in interactive competitions and telling jokes at their sessions. Humor therapy was conducted during 4 weeks and in a total of 8 sessions for the patients. During the radiation therapy and the intervention of the researcher, the patients completed the questionnaire at the end of each week until the end of the fifth week. Fatigue Symptom Inventory (FSI) is

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one of the fatigue assessment tools which was designed by Hann and colleagues. It is placed in the categories of Multidimensional Fatigue Assessment tools. A review study has confirmed the correspondence of the questions with other tools as well as its convergent validity (Profile of Mood States Fatigue subscale = POMS). The correlation coefficient was also confirmed to be 0/75 (20). The questionnaire consists of 14 questions which are designed in the Likert scale of 0-10. Score of zero indicates no fatigue, mild fatigue is scored between 1-3, 4-6 accounts for moderate fatigue, severe fatigue is scored between 7-9 and 10 indicates severe fatigue. FSI was translated into Persian and after it was validated by a group of 10 professors and scholars, it was further studied. After making certain alterations, the inventory was used in experiments. The reliability of the questions was verified by the coefficient of Cronbach's alpha 0/8. Due to the repeated measurments of the size of the fatigue in patients, ANOVA was used for repeated measures in 5 consecutive weeks. Moreover, the data were analyzed using independent T-test, Chi-square and Fisher's exact and $p<0.05$ was considered significant.

Results

The mean age of participants was 49.3 ±13.08 years. The majority were married (72%) and in stage 2 of the disease (%58.6) (table 1). During the first week of the radiation therapy (before the implementation of humor therapy), an average of 15% in both the treatment and control group complained of no fatigue and 84% of them reported mild fatigue. The mean fatigue scores in the first week of the radiation therapy in the humor therapy group was 0.93±0.74 and 1.01±0.96 in the control group. Neither group showed any significant differences with regards to the fatigue they had experienced by the end of the first week after their radiation therapy. Sequential measurements of the fatigue during the first, second, third, fourth and the fifth week showed a statistically significant difference (F=170.445, p=0.001). The interactive effect of the treatment indicated that the fatigue between the treatment and the control group was statistically significant in weeks 2 and 5 (F=34/537, p=0.001). The mean fatigue for the humor therapy group 3.36±1.35 and 1.67±7.29 for the control group in the fifth week. Moreover, laughter therapy considerably reduced the amount of fatigue in the intervention group (t=9/85, p=0/001).

Table 1. Demographic Characteristics of Subjects

Group Variable	Control	Laugher Therapy	p-value
Age (mean±SD)	51.93±13.61	43.82±12.23	0.139
Educational Status N(%)			
Illiterate	9(31.03)	8(27.6)	
Primary	7(24.13)	5(17.24)	0.646
Secondary	9(31.03)	7(24.13)	
Academic	4(13.79)	9(31.03)	
Marital Status N(%)			
Married	20(68.96)	22(75.86)	
Single			0.677
Widowed	9(31.03)	7(24.13)	
Divorced			
Duration of Developing (months) (mean±SD)	17.06±16.10	13.34±14.69	0.727
Tumor Stage N(%)			
I	3(10.34)	5(17.24)	0.813
II	18(62.06)	16(88.17)	
III	8(27.58)	8(27.58)	
Hemoglobin (g/dl) (mean±SD)	11.40±1.02	11.82±1.03	0.124
History of Breast Surgery N (%)			
Breast Lift	25(86.2)	23(79.31)	0.487
BreastConservation	4(17.24)	6(20.68)	

The amount of fatigue in the humor therapy group was changeable from mild to moderate in the fifth week of the radiation therapy. As for the control group, severe and very severe problems were reported (fig 1). The comparison of the fatigue samples before and after the intervention and repeated measures via ANOVA through pairwise comparisons of the fatigue revealed the scores.

Between the first week (before intervention) and the second, third, fourth and the fifth week after the intervention, there was a statistically significant difference in both the usual care and the humor therapy group (p=0/0001) (table 2).

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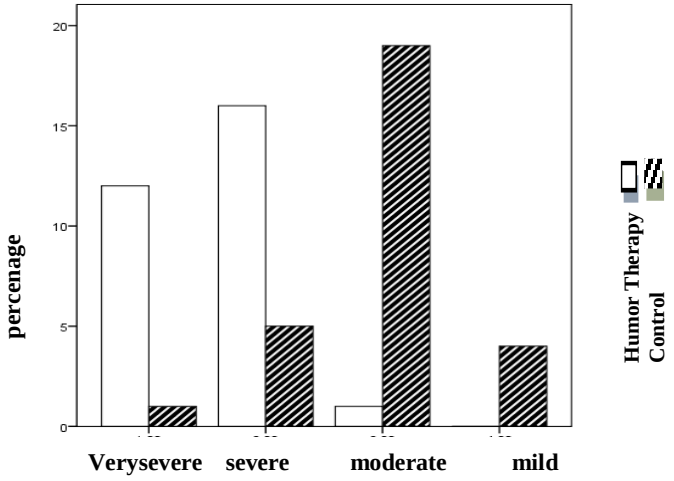

Figure 1. Comparison of fatigue at the end of the fifth week of humor therapy in the control group and the humor therapy group

Table 2. Mean scores of fatigue at the end of the first week (before) and the second to the fifth weeks of intervention in humor therapy and control group

Weeks of radiation treatment (before and after intervention)	Laugher Therapy		control	
	Mean±SD	p-values compared to the week before the intervention	Mean±SD	p-values compared to the week before the intervention
End of the first week (the week before the intervention)	0.74±0.93	-	0.96±1.01	-
The end of second week	1.21±0.71	0.03	3.46±1.16	0.001
The end of third week	1.68±0.87	0.001	5.20±1.66	0.001
The end of fourth week	2.80±1.14	0.001	5.81±1.90	0.001
The end of fifth week	3.35±1.35	0.001	7.29±1.67	0.001
result of repeated measures ANOVA	F=22.113		F=195.554	

Discussion

The results of this study show the positive effects of humor therapy on the amount of CRF in the patients undergoing radiation therapy through a four-week intervention. Our experiment confirms the fact that the amount of fatigue in the humor therapy group was noticeably lower during radiation therapy than in the control group. In their study which was performed on 67 patients on on the postpartum fatigue, Shin et al. opted for humor therapy sessions lasting for 60 minutes, twice a week for two weeks (4 sessions in total). The result was indicative of largely reduced fatigue in the patients (21) which was similar to the results of the present study. However, this particular type of fatigue is quite different from CRF which is a more severe condition. In a study conducted on patients with Multiple Sclerosis (MS), Moshtagh-Eshgh et al. reported that humor therapy sessions which last for 30 minutes three times a week for a period of 12 weeks are effective in reducing fatigue in MS patients (22). Since the fatigue associated with MS is chronic and thus shares the same nature with CRF, this study confirm our results.The technique used in this study was humor which, in comparison with other techniques such as Laughter Yoga, requires no expertise or any training courses. As a result, it can be applied by any of nurses.On the other hand, its ease of

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implementation leads to a greater acceptance on behalf of the patients. Frankenfield exploited humor and play in order to reduce the stress of chest catheterization for chemotherapy in a 5-year-old boy diagnosed with retinoblastoma tumor. He managed to reduce the pain, fear and anxiety in the child by tickling him, playing funny videos and telling jokes before every phase. This also helped increase the child's cooperation for the rest of the procedure (23).

In the present study, it can be seen that before and after the intervention in the humor therapy group compared with the control group during the weeks of radiation therapy, the fatigue has an upward trend in both groups with a difference in the slope of the increase. Despite the fact that fatigue can be spotted in both the humor therapy and the control group, this amount is considerably less in the former. Our findings indicate that at the end of the fifth week, mild to moderate fatigue was observed in the humor therapy group whereas in the control group, severe fatigue problems were reported. However, a relative increase in the fatigue due to the side effects of radiation and the presence of other events, such as personal issues like being away from home or other family related problems, was also expected in the therapy group. With regards to the number of humor therapy sessions, the time of radiation therapy as well as the type of fatigue which was cancer-related were taken into account. Ultimately, eight sessions in four weeks were decided upon.

Our study is similar to the study of Cho and colleagues study in that they also decided to hold the same number of therapy sessions in four weeks. Additionally, they reviewed the effects of humor therapy on depression, quality of life and the immune response of cancer patients. The pair-comparison of the two different types of fatigue during the weeks of radiation therapy proved that fatigue had changed every week and it had increased over time (24). For another thing, the findings of Geinitz and colleagues shows an increase of fatigue in CRF patients during the radiation therapy weeks up to the fourth week (25). However, the fatigue tended to stabilize from that point on. On the other hand, this study, in line with the study of Irvine et al., showed an increase of the fatigue during the treatment until the end of the treatment. Furthermore, culminating fatigue was reported within the five-week treatment in both the control group and the humor therapy group (26). An experiment done by Aghili et al. reveals the effects of exercise on CRF patients undergoing radiation therapy. In the course of radiation therapy, fatigue in both intervention and the control groups increased. Comparatively, the fatigue was noticeably higher in the control group (5) which is consistent with our results.

The reasons for the consistency of the present study with the aforementioned studies in the assessment of the process of fatigue clarifies that fatigue soars along with increase in the number of radiation therapy sessions. Fatigue is considered as a side effect of cancer and radiation therapy which results from the destruction of the tumor. Any additional stress during the treatment process on the patient and his family is expected to result in fatigue. Cancer does not affect the patient's body only; it also distresses the patient emotionally. Thus, nurses could play a key role in soothing this tension (27). Humor therapy, as a different and appealing method in the current course of treatments in hospitals, can lead to the acceptance of the patients for establishing a helpful relationship with the medical team.

In a qualitative research, Greenberg stated that humorous activities act as a positive medium in the course of the treatment resulting in the health promotion and creating a trustful relationship between the nurse and the patient. He also claimed that using humor in the treatment process obtains medical targets faster and helps patients to cope with the disease, calm down and steer clear of negative emotions (28). According to the findings of this study and other similar studies, it appears that laughter has a major role in reducing or eliminating the symptoms of the disease which is associated with an increased compatibility with stress-causing hormones like cortisol and it can also enhance the body's readiness to deal with all kinds of distress (29). On the same note, patients with any illness, at any age and with any gender coming from any social class and with any culture and nationality can benefit from laughing and stay happy in order to enhance their health and quality of life (18). There were a number of limitations in this study. For instance, losing some patients due to their illness or

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forother reasons during the intervention, which was ultimately made up for with new patients joining in the treatment group. This problem was solved upon the completeion of sampling and the sample size. For another thing, gathering the patients at an agreed time and the difficulty of traveling for some patients lead to the absence of some participants in the meetings. Nevertheless, the problem of the absence of some patients in one or two meetings was resolved by holding a few humor therapy make-up sessions. If the research units were absent in make-up sessions, they had to be excluded from the study. While looking at our findings, certain things need to be taken into account; for instance, the differences in individual attitudes towards humor in the research units, the number of indifferent responses or the different amounts of laughter in every subject.

However, based on the type of study (Humor) and the use of stimulants, the main purpose of this experiment was to create entertainment and jubilance rather than making the patients laugh objectively. On the other hand, the diversity and age difference (middle-aged to elderly) among the research units lead to a happier and more dynamic atmosphere during the therapy sessions. Coming together and the experience of happy assemblies dismissed monotony and passivity among the participants. The active participation of the research units and their ongoing interaction during the meetings lead us to highly satisfactory results by the end of the experiment. The research units were supervised on their regular attendance and the schedule of the meetings was efficiently managed by the researcher.

The findings of this study reveal that laughter therapy is largely effective in reducing fatigue in patients as well as improving their life standards. The health system needs to provide a lighthearted, helpful environment for patients and medical professionals ought to take advantage of happiness as an available and inexpensive therapeutic medium. It is advisable to conduct further studies on the long-term effects of humor therapy on the surviving cancer patients after their treatments so as to alleviate CRF symptoms. Further research on humor therapy for treating breast cancer patients receiving chemotherapy and male cancer patients is also recommended.

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