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EFFECTIVENESS OF MINDFULNESS-BASED COGNITIVE THERAPY IN ALLEVIATING SYMPTOMS OF ANXIETY AND DEPRESSION AMONG WOMEN WITH BREAST CANCER AND GYNECOLOGICAL CANCER

LOTFI KASHANI FARAH[1], ABDOLLAHI FATEMEH[2*], S KHAN MAHMOOD[3], AKBARI MOHAMMAD ESMAEIL[4], MANSOUR MOSHTAGHI NAZANIN[4]

1: Associate professor, Cancer Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran, Department of Psychology, Islamic Azad University, Roudehen Branch, Roudehen, Iran

2: PhD Research Scholar, Department of Psychology, Aligarh Muslim University, Aligarh, India

3: Professor, Department of Psychology, Aligarh Muslim University, Aligarh, India

4: Professor, Cancer Research Center, Shahid Beheshti University of Medical Science, Tehran, Iran

5: Cancer Surgery Fellowship, Cancer Research Center, Shahid Beheshti University of Medical Science, Tehran, Iran

***Corresponding Author: E Mail:** fatemeh.abdollahi.psy@gmail.com**; Tel: 0091 9886232410**

ABSTRACT

Background: The purpose of this research was to examine the efficacy of mindfulness-based cognitive therapy in alleviating symptoms of anxiety and depression among women with breast and gynecological cancer. World Health Organization and medical experts have expressed alarm about constantly the growing problem of cancer patients in the world. The researchers emphasize that the diagnosis of cancer not only has obvious physical ramifications for the patient, but also the trauma of a diagnosis produces psychological problem such as anxiety and depression. Research on Mindfulness-Based Cognitive Therapy has supported the safety and effectiveness of this approach might be used with anxiety and depression associated problems among cancer patients.

Materials and Methods: This pilot study employed a pretest-posttest and intervention group-control group design to evaluate the outcome of the intervention for individuals receiving MBCT in Cancer Research Center of Shohadie Tjrish hospital. A total of 82 patients were participated in the study (Intervention Group=41, Control Group=41) and 61 participants completed the study (Intervention Group=29, Control Group=32). 29 of 41 enrolled participants completed the MBCT intervention. Twenty-nine participants completed the pretest and posttest assessments, which demonstrated statistically significant improvement on outcome measures, including the Hospital

Anxiety Depression Scale. **Results:** After adjusting for pretest, there was a significant effect of MBCT on the combined dependent variables of Anxiety and Depression (F (2,53) =124.370, P<0.000; Wilks' Lambda= 0.176; partial eta squared=.824). Analysis each individual dependent variable using a Bonferroni adjusted alpha level of 0.025, showed there was significant effect of MBCT on Anxiety (F (1,57) =247.223, P<0.000; partial eta squared=.821) and Depression (F (1,57) =118.526, P<0.000; partial eta squared=.687). Results are consistent with studies indicating that MBCT offers promise in alleviating anxiety and depression symptoms for women with breast and gynecological cancer.

Conclusion: It suggests need for a comprehensive solution that combines medical, psychological, social and behavioral approach to this complex problem in initiating the distress of cancer patients.

Keywords: Mindfulness-Based Cognitive Therapy, Anxiety, Depression, Breast Cancer, Gynecological Cancer

INTRODUCTION

Cancer is a major burden of disease worldwide. According to the Ministry of Health and Medical Education (MOHME) Cancer is the third top reason of deaths in Iran after cardiovascular diseases and accident. MOHME reported cancer incidence has expanded strangely in Iran, as consistently around 105 individuals in the country die of cancer. There are around 63,000 cases of cancer uncovered in the country every year [1].

Female cancer, especially breast and gynecologic cancers are a major public health problem in the world. The prevalence, incidence and lifetime risk of breast cancer and gynecological cancer indicates the importance of conducting studies in the area of breast and gynecological cancer treatment and patient care, and also these cancers are considered multistage disease, highly influenced by

risk and protective factors and/or screening preventive modalities.

Breast and gynecological cancer occurrence is highly influenced by environment, genetic, gender, age, race, socioeconomic status, education, culture, obesity, and all life style related factors which might result in incidence rate change of these cancers in every population [2, 3]. Main gynecologic cancers (ovary, endometrium and cervix) besides breast cancer are responsible for 1.6% of total human cancers in the world [4]. Breast, endometrium and ovary are cancers with high incidence in the developed and western countries, North Europe and North America. Lower incidence in the less developed regions including Asian countries is observed [5]. Breast and gynecologic cancer incidence rates are the consequence of many factors. A common well known etiology for breast, ovarian and

endometrial cancer is parity, with lower incidence in multiparous women [6,7]. Study of incidence trend might clarify epidemiologic and clinical points to be studied more and used as and documented background for decision making and necessary interventions [8].

Breast cancer is the most common cancer in women worldwide and its incidence rate is increasing, especially in developing countries [9].

In addition, breast cancer has the most years lost due to disability in Iran, because it develops at lower age and is diagnosed at higher stage [10]. Nonetheless, reports imply that survived patients will double by 2030 [11, 12]. This might be owing to improvements in diagnostic techniques and general population awareness in this area [13, 14]. However, cancer diagnosis and treatment process can affect physical, psychological, spiritual, sexual and social health of women [13]. Diagnosis and treatment of these cancers are associated with highrates of often persistent psychological distress such as anxiety and depression and also ongoing challenges to quality of life (QOL) [15, 16, 17, 18, 19], and it can affect physical, spiritual, sexual and social health of women [13].

Palliative care should be integrated into standard oncology care at the time a person is diagnosed with gynecologic cancer and/or has a high symptom burden. Training of oncology healthcare professionals should include delivery of palliative care [20]. The majority of people affected by cancer are able to cope without specific psychological interventions, finding strength in themselves and in close friends and family. A significant proportion of cancer patients suffers from psychological distress and is in need of appropriate psychological treatment [21].

The manualized 8-week MBCT group focuses on instructing participants how to be mindful. Mindfulness is the simple practice of paying attention to what is happening in the present moment in the mind, body, and surroundings in a nonjudgmental, curious way [22]. MBCT is combination of mindfulness and cognitive behavior therapy technique to help individuals identify common ways people try to escape difficult thoughts, feelings, and sensations, such as turning to substances, drugs, food, and other behaviors. Thus, MBCT teaches acceptance, nonjudgment, and coping strategies to deal with difficulties more effectively.Mindfulness-based cognitive therapy (MBCT) [23], which employ training in mindfulness skills, are increasingly popular in oncology settings and their effectiveness is supported by a

burgeoning empirical evidence base [17,19].

The results of research of Rahmaniand Talepasand (2015) [24], showed that the mindfulness - based stress reduction treatment can be effective in improving global and specific life quality and fatigue severity in women with breast cancer. A recent study of internet-based MBCT for treatment of chronic cancer-related fatigue using a treatment format similar to ours indicated a non-adherence rate of 38 %, which is higher than in comparable face-to-face interventions.

Within the area of cancer care, mindfulness-based therapeutic interventions such as MBCT have been found to be efficacious in reducing psychological distress related to a cancer diagnosis; however, the impact of mindfulness-based interventions on quality of life is unclear. This study explores the impact of a Mindfulness-Based Cancer Stress Management programme on psychological distress and quality of life. Findings indicated that the MBCT programme is effective in reducing psychological distress and improving quality of life, including spiritual well-being [25]. The systematic review by Cramer and colleagues (2012) [26], found some evidence for the effectiveness of MBCT and MBSR in improving

psychological health and spiritual well-being in breast cancer patients. Mindfulness-based cognitive therapy has been demonstrated to be effective in reducing anxiety, depression and fatigue in cancer patients and also improved emotional, psychological and social well-being among cancer patients [27].

METHOD

Participants

In this study was decided to fix the sample size as women with breast and gynecologic cancer in the age range of 24 - 65 years were referred by a hematologist, oncologist, gynecologist, surgeon, and primary care physicians who are affiliated with Cancer Research Center (CRC) of Shahid Beheshti University of Medical Science (SBMU) community-based hospital (Shohada Tajrish Hospital) located in Tehran within 8 months following a diagnosis of cancer. The sample size was calculated using the power calculation software G Power table 5 [28, 29]. Assuming power 0.6 and an average effect size of .5, and given a = .05, the sample size required to detect this effect is N1=41, N2=41. Only participants, who scored eight or higher in the anxiety and depression subscales of the HADS [30], were invited to participate in this study. Patients, who did not meet the criteria for participation, were offered services with other therapists

at the hospital. Out of the 82 patients who were approached, 11 declined to take part in the study. Thus the response rate was 87% and the study sample was 86% of all patients meeting inclusion criteria. Approximately 71 patients meeting inclusion criteria, the study population assigned randomly to the Intervention Group (n=36, $G_{1=}12$, $G_{2=}12$, $G_{3=}12$) and Wait-List Control Group (n=37). 10 of these patients were not approached, the reasons given by patients declining to participate included feeling too tired or unwell, or dislike of the questionnaires. The study population consisted of 61 women (Intervention Group (n=29) and Wait-List Control Group (n=32)).

Research Design

This study attempted to show the Intervention Group, who received 8-session MBCT interventions, would report reduction in anxiety and depression symptoms than the Wait-List Control Group, who received no intervention. Following completion of 8 MBCT sessions, the participants assigned to the Intervention Group received two follow-up telephone calls to encourage participants to use the MBCT methods to ascertain their present condition.

MBCT treatment for the present study comprised 8 weekly meetings lasting approximately 2:30 hours each. The study protocol however ran across 10 weeks to allow for pre-and post-treatment data collection in Weeks 1 and 10. The 8 weekly MBCT group sessions were conducted across Weeks 2 to 9 following the manualized MBCT program including guided relaxation and mindfulness meditations, group discussions, psychoeducation, and homework assignments (30-45 minute daily mindfulness practice using instructional CDs) [31].

Measures

Hospital Anxiety and Depression Scale (HADS)

[30] is a brief self-assessment scale which was developed for use with medically ill male and female patients between the ages of 18 and 65 to screen for adjustment, major depressive, or anxiety disorders. The anxiety subscale consists of seven items which measure anxiety. The correlation between anxiety items ranged from +0.76 to +0.41 and significance was p<0.01. The seven items measuring depression had "correlations ranging from +0.60 to 0.30, all significantly beyond p<0.02" (p. 363). The correlation (Spearman) results of the subscale scores and psychiatric ratings were r=0.70 for depression and r=+0.74 for anxiety, found both these figures to be significant (p<0.001). The HADS reports reliability for

the anxiety subscale of 0.83 and depression subscale of 0.82, which is similar to other assessment tools. The HADS has been shown to perform well in assessing depression in psychiatric and primary patients, and the general population [32,33]. In general the Iranian version of the HADS was found to be acceptable to almost all patients (99%). Cronbach's alpha coefficient (to test reliability) has been found to be 0.78 for the HADS anxiety sub-scale and 0.86 for the HADS depression sub-scale. Validity as performed using known group's comparison analysis showed satisfactory results. Both anxiety and depression subscales discriminated well between sub-groups of patients differing in clinical status as defined by their disease stage [34].

RESULTS

A research study investigating the effects of MBCT interventions may provide a new approach to coping with the initial diagnosis of cancer. This intervention includes emotional processing of initial reaction to diagnosis, psycho educational information regarding cancer, mindfulness, relaxation techniques and exercises, and cognitive restructuring skill development. Research questions and their constituent hypotheses for the study included the following:

Does MBCT intervention significantly alleviate anxiety, depressive symptoms in women diagnosed with cancer more than patients in a non-treatment Wait-List Control Group?

$H_{1.a}$. **The intervention group, which received MBCT, will describe and show a measurable alleviation of anxiety symptoms more than a non-treatment Wait-List Control Group.**

$H_{1.b}$. **The intervention group, which received MBCT, will describe and show a measurable alleviation of depressive symptoms more than a non-treatment Wait-List Control Group.**

Table 1 shows that the mean and standard deviation scores in the intervention group in anxiety pre-test is 2.08 and 0.181 and in anxiety post-test is 1.22 and 0.277 respectively. Distribution of intervention's group scores has positive skewness in pre-test as well as in post-test. Distribution of scores has skewness and kurtosis within two standard deviation and almost it is normal. The mean and standard deviation scores in the control group in anxiety pre-test is 2.17 and 0.266 and in anxiety post-test is 2.13 and 0.244 respectively. Distribution of control's group scores has positive skewness in pre-test as well as in post-test. Distribution of scores has skewness and kurtosis within two standard deviation and almost it is normal.

Table 2 shows that the mean and standard deviation scores in the intervention group in depression pre-test is

equal to 1.70 and 0.271 and in depression post-test is 0.89 and 0.354 respectively. Distribution of intervention's group has positive skewness in pre-test and has negative skewness in post-test. Distribution of scores has skewness and kurtosis within two standard deviation and almost it is normal. The mean and standard deviation scores in the control group in depression pre-test is equal to 1.61 and 0.383 and in depression post-test is 1.57 and 0.391 respectively. Distribution of control's group has positive skewness in pre-test as well as in post-test. Distribution of scores has skewness and kurtosis within two standard deviation and almost it is normal.

Table 3 Shows that the homogeneity slope of the regression line in anxiety in groups is statistically significant and the default univariate analysis of covariance is observed. On the other hand, the results indicates that there is no significant impact in pre-test and the effect size is high and the report of corrected means are necessary.

Table 4 shows that the homogeneity slope of the regression line in depression in groups is statistically significant and the default univariate analysis of covariance is not observed. On the other hand, the results

indicates that there is significant impact in pre-test. This is due to the extreme scores among the groups.

Table 5 shows the Wilk's Lambda's index is significant. In other words the general model is significant and has far-reaching.

Table 6 shows that there is significant difference between groups in order to anxiety (F=8.796, df1, 54 P<.000; eta= .821). The effect size is 0.821 and it is too much. The intervention group's mean in anxiety is lower than the control group's mean. There is significant difference between groups in order to depression (F=118.526, df1, 54 P<.000; eta= .687). The effect size is 0.687 and it is higher than average. The intervention group's mean in depression is lower than the control group's mean.

Table 7 shows descriptive indexes of anxiety and depression after controlling effects of pre-test. As it is obvious the mean are corrected after controlling effects of pre-test. The intervention group's means are higher than the control group's mean.

Figure 7, 8 Indicates that anxiety and depression scores in intervention group are lower in compare with control group.

Table 1: Descriptive statistics for Groups in pre-test (Anxiety1) and post-test (Anxiety2)

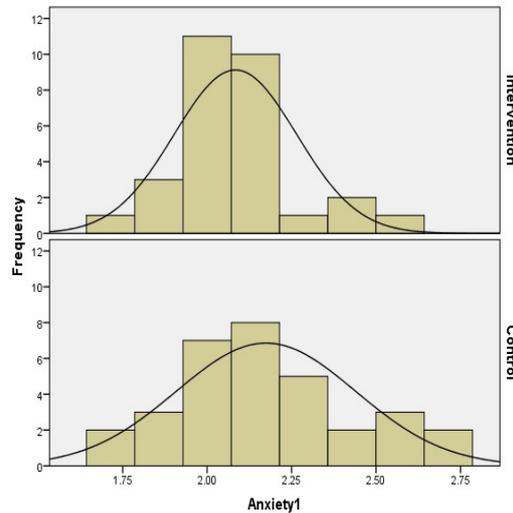| Group		N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
Intervention	Anxiety1	29	1.71	2.57	2.08	.181	751	.434	.321	.845
	Anxiety2	29	.71	2.00	1.22	.277	849	.434	.003	.845
Control	Anxiety1	32	1.71	2.71	2.17	.266	395	.414	.339	.809
	Anxiety2	32	1.57	2.71	2.13	.244	444	.414	.428	.809

Figure 1: Anxiety (pre-test) by group

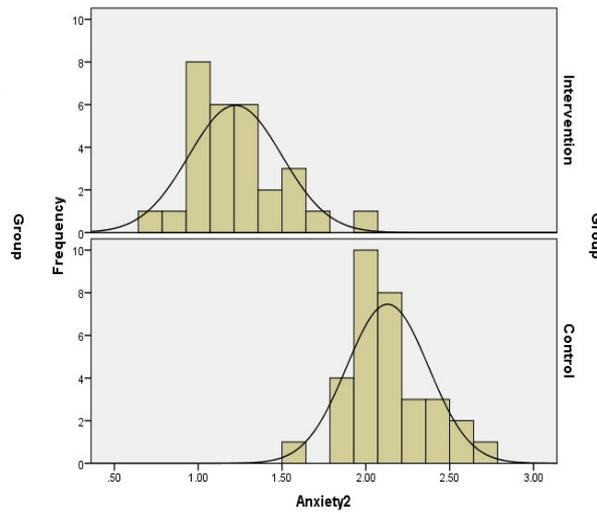
Figure 2: Anxiety (post-test) by group

Table 2: Descriptive statistics for Groups in pre-test(Depression 1) and post-test (Depression 2)

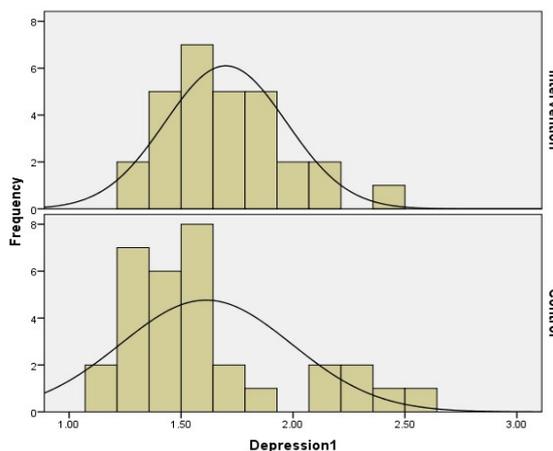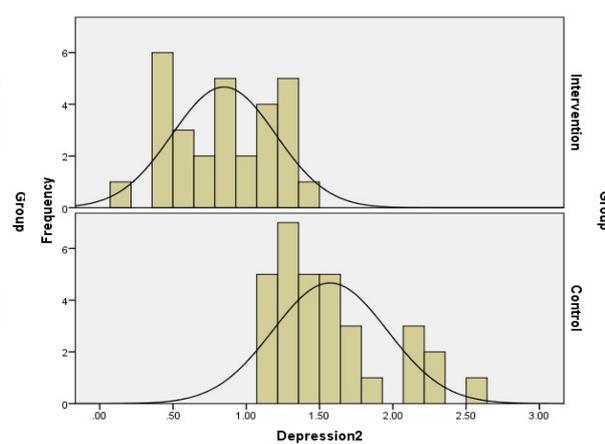| Group		N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
Intervention	Depression1	29	1.29	2.43	.70	.271	733	.434	.485	.845
	Depression2	29	.14	1.43	.89	.354	.112	.434	1.152	.845
Control	Depression1	32	1.14	2.57	.61	.383	.150	.414	.433	.809
	Depression2	32	1.14	2.57	.57	.391	.008	.414	.154	.809

Figure 3: Depression (pretest) by group

Figure 4: Depression (post-test) by group

Table 3: Tests of Between-Subjects Effects for Homogeneity of Slopes in Anxiety

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	14.530[a]	3	4.843	137.698	.000
Intercept	.002	1	.002	.065	.799
Group	.026	1	.026	.736	.394
Anxiety1	1.478	1	1.478	42.018	.000
Group * Anxiety1	.025	1	.025	.701	.406
Error	2.005	57	.035		
Total	192.388	61			
Corrected Total	16.535	60			

a. R Squared = .879 (Adjusted R Squared = .872)

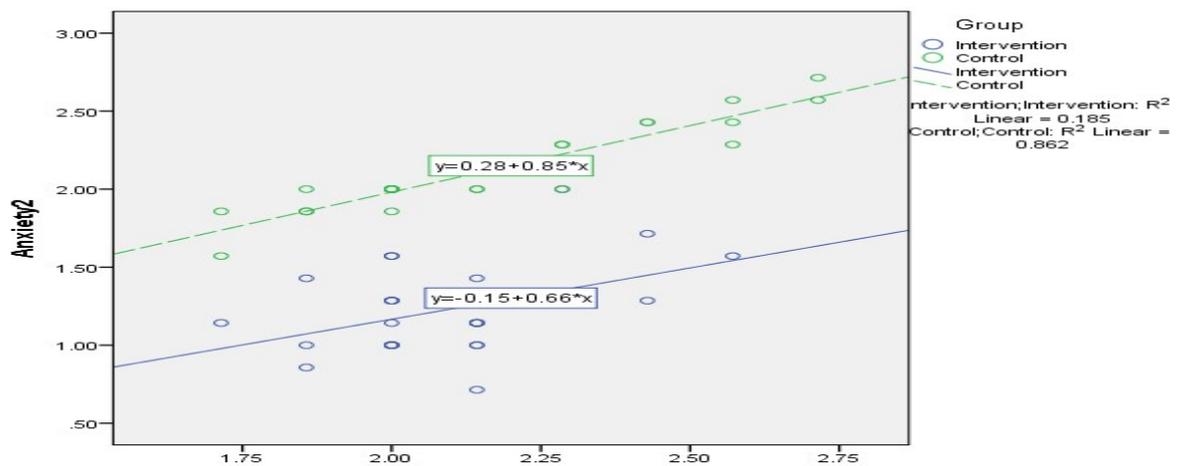**Figure 5: Homogeneity of Regression Slops in Anxiety**

Table 4: Tests of Between-Subjects Effects for homogeneity of slopes in Depression

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	12.741ᵃ	3	4.247	69.591	.000
Intercept	.002	1	.002	.026	.873
Group	.002	1	.002	.027	.870
Depression1	2.934	1	2.934	48.076	.000
Group * Depression1	.369	1	.369	6.046	.017
Error	3.479	57	.061		
Total	108.082	61			
Corrected Total	16.219	60			

R Squared = .786 (Adjusted R Squared = 0.774

Figure 6: Homogeneity of Regression Slops in Depression
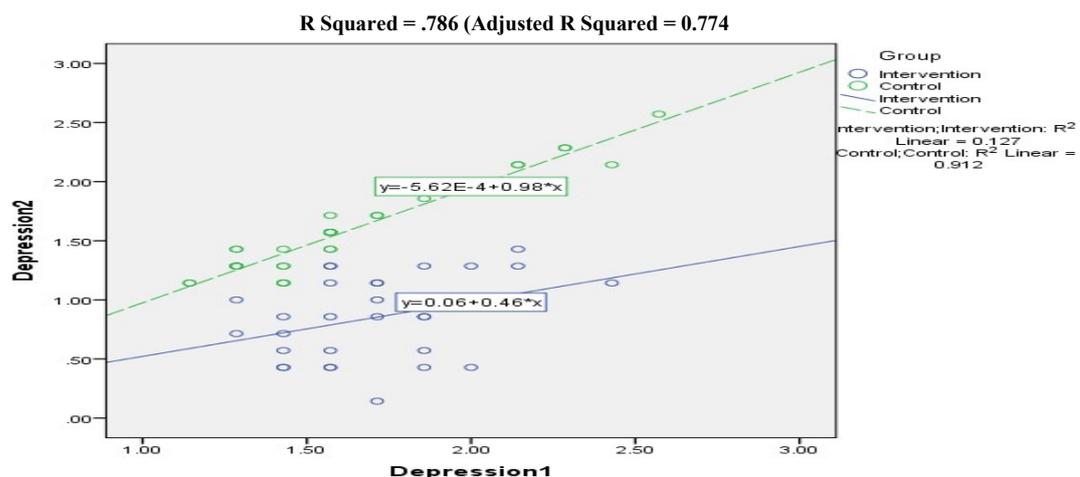
Table 5: Multivariate Tests in Anxiety and Depression

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.028	.756	2.000	53.0	.475	.028
	Wilks' Lambda	.972	.756	2.000	53.0	.475	.028
	Hotelling's Trace	.029	.756	2.000	53.0	.475	.028
	Roy's Largest Root	.029	.756	2.000	53.0	.475	.028
Anxiety1	Pillai's Trace	.528	29.628	2.000	53.0	.000	.528
	Wilks' Lambda	.472	29.628	2.000	53.0	.000	.528
	Hotelling's Trace	1.118	29.628	2.000	53.0	.000	.528
	Roy's Largest Root	1.118	29.628	2.000	53.0	.000	.528
Depression1	Pillai's Trace	.582	36.838	2.000	53.0	.000	.582
	Wilks' Lambda	.418	36.838	2.000	53.0	.000	.582
	Hotelling's Trace	1.390	36.838	2.000	53.0	.000	.582
	Roy's Largest Root	1.390	36.838	2.000	53.0	.000	.582
Group	Pillai's Trace	.824	124.370	2.000	53.0	.000	.824
	Wilks' Lambda	.176	124.370	2.000	53.0	.000	.824
	Hotelling's Trace	4.693	124.370	2.000	53.0	.000	.824
	Roy's Largest Root	4.693	124.370	2.000	53.0	.000	.824

Table 6: Tests of Between-Subjects Effects in Anxiety and Depression

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Anxiety2	14.120[a]	3	4.707	132.290	.000	.880
	Depression2	11.938[b]	3	3.979	58.025	.000	.763
Intercept	Anxiety2	.000	1	.000	.010	.922	.000
	Depression2	.080	1	.080	1.164	.286	.021
Anxiety1	Anxiety2	1.651	1	1.651	46.392	.000	.462
	Depression2	.036	1	.036	.530	.470	.010
Depression1	Anxiety2	8.206E-5	1	8.206E-5	.002	.962	.000
	Depression2	3.553	1	3.553	51.808	.000	.490
Group	Anxiety2	8.796	1	8.796	247.223	.000	.821
	Depression2	8.128	1	8.128	118.526	.000	.687
Error	Anxiety2	1.921	54	.036			
	Depression2	3.703	54	.069			
Total	Anxiety2	186.490	58				
	Depression2	105.020	58				
Corrected Total	Anxiety2	16.041	57				
	Depression2	15.641	57				

a. R Squared = .880 (Adjusted R Squared = .874);
b. R Squared = .763 (Adjusted R Squared = .750)

Table 7: Estimates after controlling effects of pre-test

Dependent Variable	Group	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Anxiety2	Intervention	1.255	.038	1.179	1.332
	Control	2.087	.034	2.018	2.156
Depression2	Intervention	.800	.053	.694	.907
	Control	1.600	.048	1.504	1.695
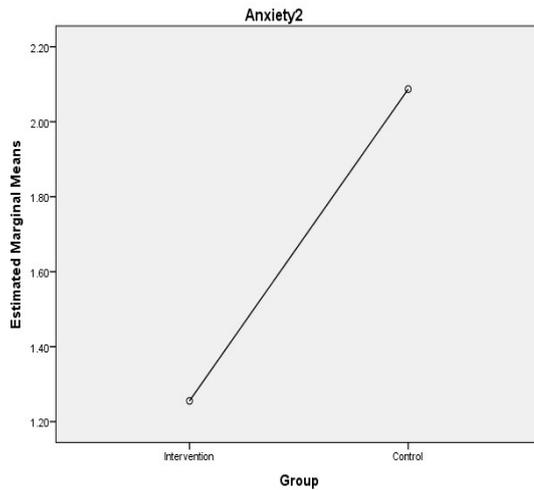
Figure 7: Mean plot in Anxiety post-test
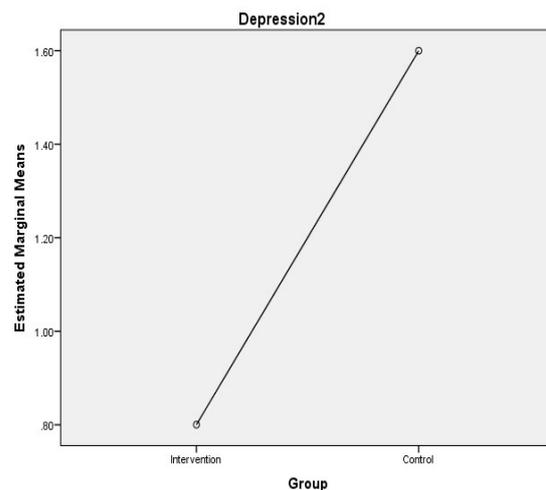
Figure 8: Mean plot in Depression post-test

DISCUSSION

In this study, we examined the effects of mindfulness-based interventions on anxiety and depression in patients with cancer. Out of 82 patients 71 patients meeting inclusion, the study population consisted of 61 women (Intervention Group (n=29) and Wait-List Control Group (n=32)). Participants in this study had breast and gynecological cancer.

This study overall finding indicate that after adjusting for pretest, there was a significant effect of MBCT on the combined dependent variables of Anxiety and Depression (F (2,53) =124.370, P<0.000; Wilks' Lambda= 0.176; partial eta squared=.824) (see table 4.58). Analysis

each individual dependent variable using a Bonferroni adjusted alpha level of 0.025, showed there was significant effect of MBCT on Anxiety (F (1,57) =247.223, P<0.000; partial eta squared=.821) and Depression (F (1,57) =118.526, P<0.000; partial eta squared=.687).

Our overall findings indicated that mindfulness-based cognitive therapy significantly improved measures of anxiety and depression. Our findings are similar to those reported in several recent meta-analyses on this topic.

Specifically, in a meta-analysis of 9 studies [35], foundthat mindfulness-based stress reduction significantly reducedanxiety and depression in women with breast cancer.Stafford and colleagues [36] similarly reported efficacy and acceptability of mindfulness-based cognitive therapy among women with breast and gynecological cancers.

Mindfulness-based treatment and also MBCT has proven to be effective in reducing psychological distress in cancer patients [37,38]. Through the practice of mindfulness in mindfulness-based cognitive therapy a cancer patient can learn to raise in social contact, being overactive, or being too inactive [39].

In conclusion, the results of this study suggest that mindfulness-based cognitive therapy can relieve anxiety and depression among patients with breast and gynecological cancers. However, this study analyses, although clearly limited by the small number of eligible participants, suggest that the examine effect of mindfulness-based cognitive therapy among large number of cancer patients. Clearly, further research is warranted to more definitively determine the effectiveness of mindfulness-based cognitive therapy in this context and how best to optimize the persistence of benefits obtained.

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