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Original Article

The Evaluation of Effectiveness of Meaning-Based Existential Therapy on Anxiety and Serum Levels of Tumor Necrosis Factor TNF α in Women with Breast Cancer

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Abstract

Introduction: Diagnosing cancer can be a very anxious experience, and anxiety can disrupt immune system function. Tumor necrosis factor-alpha (TNF α) is an inflammatory cytokine that is associated with amplified tumor cell proliferation, higher malignancy, increased metastasis, and poor general prognosis for the patients who suffer from breast cancer.

Methods: This study is a randomized clinical trial with follow-up and control group. The experimental group underwent meaning-based existential intervention. Both groups were assessed by Beck Anxiety Questionnaire and serum levels of tumor necrosis factor before, after and three months after the intervention, and data were analyzed by repeated measures analysis of variance.

Results: The experimental group showed a decrease in anxiety scores and serum TNF α levels after receiving a psychotherapy program/interventions compared to the control group. The results show that the mean of TNF α was 47.10 ± 1.22 and the mean of anxiety was 21.75 ± 9.30 in the experimental group, while the mean of TNF α was 50.75 ± 1.71 and the mean of anxiety was 44.7 ± 12.27 in the control group, this reduction has also been observed in the follow-up phase ($0.001 \geq p$).

Conclusion: Based on the findings, meaning-based existential psychotherapy can reduce anxiety and serum TNF α levels by reducing patients' anxiety and helping to give meaning to life again. Accordingly, this treatment can be used along with medical treatments.

Keywords: Breast Cancer, Anxiety, Alpha Tumor Necrosis Factor, Psychotherapy

Introduction

Breast cancer is the most diagnosed cancer among malignant cancers, which leads to death among women (15%) (1). Caring for breast cancer patients includes the most advanced medical treatments, but it can't lead to the resolution of widespread psychological and quality of life problems associated with the disease and the transition/shift to survival after breast cancer (2). Numerous research data support the key role of the immune system in determining response to standard treatment and long-term survival in breast cancer patients (3). As researches show that psychological problems can affect the immune system, then in this study, existential psychotherapy has been used as one of the intervention methods that is effective in reducing many psychological problems, improving the quality of life and promoting mental health(4).

Material & Methods

The women with cancer who participated in the study were randomly divided into two groups of 12- experimental and control groups. Both groups were tested by Beck Anxiety Inventory and Human Laboratory Kit TNF α , produced by DIACLONE, France and by ELISA method with an accuracy of picograms per milliliter in three stages include before the intervention, after that and three months

after the last intervention. Meaning-based existential psychotherapy sessions based on the Hotzel protocol was designed, planned and implemented for 10 sessions and each session was 90 minutes.

Results

Table n.1 shows that the mean of TNF α was 47.19 ± 1.22 and the mean of anxiety was 21.95 ± 9.30 in the experimental group, while the mean of TNF α was 50.75 ± 1.71 and the mean of anxiety was 44.73 ± 12.27 in the control group, this reduction has also been observed in the follow-up phase. However, this component/ factor has not changed in the control group. Also the results reflected in Table n.2 show that the effectiveness of time and group factor in TNF α ($F=33.99$, $P \leq 0.001$), as well as in the anxiety variable ($F=51.96$, $P \leq 0.001$) is significant, which shows the effect of test conditions on TNF α as a dependent variable and anxiety in groups in three stages include pre-test, post-test and follow-up. The results of analysis of variance between subjects show the calculated values of F for the TNF α ($F=18.90$, $P \leq 0.00$) and anxiety ($F= 11.72$, $P \leq 0.00$) are significant, which shows the effect of test conditions on TNF α as a dependent variable and anxiety in groups in three stages include pre-test, post-test and follow-up.

Table 1 :Central Indices and Dispersion of TNF α and Anxiety in Pre-test, Post-test and Follow-up Stages in Experimental and Control Groups

Variable	Group	Stage	Mean	Standard deviation
TNF α	Experimental	pre-test	50/93	1/70
		post-test	47/19	1/22
		follow-up	46/73	1/75
	Control	pre-test	50/29	1/79
		post-test	50/95	1/71
		follow-up	51/03	2/75
Anxiety	Experimental	pre-test	39/42	13/57
		post-test	21/75	9/30
		follow-up	21/58	9/28
	control	pre-test	40/55	12/16
		post-test	44/73	12/27
		follow-up	42/82	12/32

Table 2: Results of Analysis of Variance Within and Between Subjects with Repeated Measures to Compare TNF α and Anxiety

	Variable	Source	Regression sum of squares	Degree of Freedom	Average Squares	F	Significant	Effect Size
Within-Subjects Tests	TNF α	Time	41/35	1/19	34/65			
		Time & Group	84/00	1/19	70/39	16/73	0/01	0/44
		Error	51/89	25/06	2/07	33/99	0/001	0/62
Between-Subjects Test	TNF α	Group	105/36	1	105/36			
		Error	117/06	21	5/57	18/90	0/001	0/47
Within-Subjects Tests	Anxiety	Time	699/67	1/04	672/33			
		Time & Group	1848/19	1/04	1775/96	19/67	0/001	0/71
		Error	746/91	21/85	34/18	51/96		
Between-Subjects Test	Anxiety	Group	4287/44	1	4287/44	11/72	0/001	0/36
		Error						

Discussion

We found that patients who suffer from cancer may experience some degree of anxiety due to existential distress, and they may need to recreate a different meaning of life to cope with illness. Negative psychological experiences can disrupt the healing process and cause patients' immune systems to act in the opposite way. Chronic anxiety and stress can impair the immune system and cytokine production. Biological responses to anxiety occur through the functioning of two systems, include the hypothalamic-pituitary-adrenal (HPA) axis and the sympathetic nervous system (SNS), that can lead to immune system malfunction (5). Meaning-based existential psychotherapy can help patients to make sense of the suffering caused by cancer, and as a result, the immune system functions will be more balanced by reducing anxiety. Numerous studies among

cancer patients show that more making sense about life (Increasing the meaning of life), is associated with better psychological outcomes (1 E.g., less depression, frustration, and anxiety) (6) and also with positive physical outcomes (7).

Conclusion

The results of the present study showed a significant effect of meaning-based existential group psychotherapy on anxiety and serum cytokine TNF α levels in women with breast cancer. The pattern of this significance showed that the correct and efficient application of this therapeutic approach can be effective in helping patients better adapt to the anxious conditions of breast cancer and it can be used in conjunction with conventional therapies to enhance immunological function.

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