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Effectiveness of Cognitive-Behavioral Therapy and Mental Imagery on Hope and Self-Efficacy of Patients with Leukemia and Lymphoma

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Abstract

Background: *Cancer treatment accompanies several psychological pressures some of which reduce the quality of life and cause anxiety and depression. The present study aimed to investigate the effectiveness of cognitive-behavioral therapy and mental imagery on the hope and self-efficacy of patients with leukemia and lymphoma.*
Methods: *The research method was quasi-experimental with a pretest-posttest design and a control group. The statistical population of this study consisted of all male and female patients with leukemia and lymphoma visiting the hematology department of Ayatollah Rouhani hospital of Babol in 2019. Of them, 45 patients (15 per group) were selected using convenience sampling and randomly assigned to two experimental groups and a control group. The first experimental group received eight 90-minute sessions of individual cognitive behavioral therapy and the second experimental group received ten 90-minute sessions of mental imagery. The control group received no intervention. The research instruments included the Miller hope scale (MHS) and cancer behavior inventory (CBI). Data were analyzed using the analysis of covariance.*
Results: *Findings suggested that cognitive-behavioral therapy and mental imagery have a significant effect on patients' self-efficacy and hope (Pvalue<0.001). There was no significant difference between the effectiveness of the two therapies.*
Conclusions: *Considering the effectiveness of the therapies, they are suggested to be utilized extensively along with medical and clinical interventions to improve the psychological well-being of cancer patients.*

Keywords: Cognitive behavioral therapy, Imagery, Hope, Self-efficacy, Cancer.
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Introduction

Cancer entails a wide range of diseases, each of which has its etiology, treatment options, and prognosis. Most cancer patients experience some psychological stress from time to time. In some patients, stress goes away on its own and does not lead to long-term mental health problems. It can be considered a natural adaptive response. Others experience more severe psychological problems that reduce their quality of life and daily functioning.[1,2] Leukemia is cancer with hematopoietic malignancies and the increasing number of these cells in the bone marrow is manifested with or without the involvement of peripheral blood cells.[3] Cancer treatment accompanies several psychological pressures some of which reduce the quality of life and cause anxiety and depression. For instance, patients often claim that the psychological side effects of treatment, such as anger, anxiety, or worry are more severe than its physical side effects, such as hair loss and nausea. Some patients may drop out of chemotherapy because of these psychological problems.[4]

Cancer-induced crises disturb the mind-body-spirit balance, but the patients are mostly struck with the feeling of despair and hopelessness. Affliction with cancer can diminish hope. Hope has a futuristic design with spiritual aspects and is considered an inner source to help people express and achieve positive goals and outcomes, especially in times of uncertainty, crisis, or stress.[5] Hope is a coping mechanism for humans to adapt to problems and even incurable diseases. In addition, it is described as a healing, multidimensional, dynamic, and powerful factor playing a major role in coping with loss.

Furthermore, increasing patients' self-trust and self-confidence in their ability to care for the disease is a key factor in active self-management of the disease. Self-efficacy provides a useful framework to understand and predict adherence to self-care behaviors and the effectiveness of self-management in cancer treatment.[6] Self-efficacies for disease management is defined as patients' trust or confidence in understanding and management of their disease, which mainly depends on their knowledge of the disease and the importance of treatment adherence, especially in chronic diseases like cancer. Perceived self-efficacy affects one's effort to perform a task, and those who believe in their self-efficacy redouble their efforts to tackle obstacles and problems. Self-efficacy in cancer patients contributes to better adaptation to cancer diagnosis and improves their quality of life.[7]

Given that hope and self-efficacy are psychological constructs, the use of psychological interventions for cancer patients helps improve these processes and assists them to experience greater hope and self-efficacy, along with medical treatments. These psychological interventions in cancer patients aim to increase their ability to cope with the anxiety of pain and tolerate medical diagnoses and therapeutic methods. Cognitive-behavioral therapy (CBT) helps patients identify and evaluate their negative thoughts. The main theme of the cognitive-behavioral approach is based on self-help and the

therapist aims to help patients develop their skills to solve the current problems and similar future problems.[8] Studies suggest that CBT is effective in reducing burnout, improving self-efficacy for diseases, and increasing life expectancy and resilience in cancer patients.[9,10]

Another new psychological approach recently used by therapists along with medical treatments to control and reduce psychological symptoms, especially in patients with chronic diseases, is the therapeutic mental imagery approach.[11] It entails techniques that use imagination and imagery to achieve the intended results such as reducing pain perception and anxiety. It is an internal communication that involves the five senses and its mechanism of action is to create an emotional mind-body connection.[12] Studies show that mental imagery is effective in reducing anxiety and frustration, the traumatic effects of disturbing memories and psychological distress, and spontaneous negative thoughts and dysfunctional attitudes in cancer patients.[13,14]

Given the ever-increasing number of cancer patients and complications following chemotherapy or other interventions, and the significance of psychological issues in the recovery of these patients, and considering the spread of psychological therapies affecting chronic diseases such as cancer, cognitive behavioral therapy, and mental imagery were used and compared in this study to better understand their effectiveness. Accordingly, this study aimed to investigate the effectiveness of cognitive-behavioral therapy and mental imagery on the hope and self-efficacy of patients with leukemia and lymphoma.

Materials and Methods

This was a quasi-experimental study conducted using a pretest-posttest control group design. The statistical population of this study consisted of all male and female patients with leukemia and lymphoma visiting the hematology department of Ayatollah Rouhani hospital of Babol in 2019. Of them, 45 patients (15 per group) were selected using convenience sampling and randomly assigned to two experimental groups and a control group. Inclusion criteria were affliction with cancer and being admitted to the hematology ward, patients' consent to participate in the study, minimum high school education to understand therapeutic concepts, absence of severe psychological disorders that require medication, absence of neurological diseases such as epilepsy and Alzheimer's, no addiction to drugs and alcohol, the ability to move hands and having a mental function, having the ability and the energy to complete the inventories, and their physicians' approval for their participation in the study. Exclusion criteria were withdrawing from the study, concomitant use of psychedelics, and patient's illness during the intervention when the physician forbids attending therapy sessions.

The study process is summarized into 5 steps. First, 50 patients were selected and randomly assigned to three groups of 15. Then, a pre-test was conducted. The first group received 8 sessions of cognitive-behavioral therapy, and the second group received 10 sessions of individual therapeutic mental imagery, while the third group received no intervention. Then, the post-test was conducted using questionnaires filled out by the three groups.

Miller Hope Scale (MHS): The MHS was developed in 1988 by Miller and Powers. The first version was a 40-item scale which was later developed into a 48-item scale. The scale aims to measure individuals' levels of hope. It is scored on a 5-point Likert scale (from Strongly Disagree=1 to Strongly Agree=5). On this scale, 14 items are scored inversely. Since there is no subscale in this inventory, all items are summed up to obtain the total score. The scores range from 48 to 240. The higher the score, the more hopeful the individual.[15] Abdi et al.[16] reported a Cronbach alpha coefficient of 0.86 for the questionnaire.

Cancer behavior inventory (CBI): The CBI is a 33-item scale with 7 subscales. The subscales include maintenance of activity and independence, coping with treatment-related side-effects, accepting cancer/maintaining a positive attitude, seeking and understanding medical information, affective regulation, seeking support, and stress management. The total CBI score was obtained by summing up the scores of 33 items. In addition, the scores of various factors could be compared. To do so, the score of each factor is divided into the number of items in that factor. The minimum and maximum scores in this scale are 33 and 297, with higher scores indicating higher self-efficacy of cancer patients.[17] Karamoozian et al.[18] reported a Cronbach alpha coefficient of 0.75 for the questionnaire.

Cognitive-behavioral therapy: The cognitive-behavioral group therapy sessions include the following contents. Session 1: Introducing members with each other in the group; becoming acquainted with the logic of stress management and setting therapy goals. Session 2: Reviewing assignments from the previous week; introducing the concept of stress management; increasing awareness on physical responses to stressful events. Session 3: Review assignments from the previous week; introducing automatic thoughts and starting to identify cognitive distortions. Session 4: Review assignments from the previous week; learn to replace logical thoughts through stress management. Session 5: Reviewing assignments from the previous week; coping styles (Section 1); introducing the coping theory; increasing awareness about different coping styles. Session 6: Reviewing assignments from the previous week; coping (Section 2), learning and practicing long effective steps; practicing flexibility/acceptance for overwhelming stressors. Session 7: Reviewing assignments from the previous week; identifying useful/harmful sources of social support; learning new strategies for developing and expanding supportive networks. Session 8: Reviewing assignments from the previous week; identifying the features of anger patterns; learning new strategies for anger assessment and management; concluding sessions; analyzing and discussing results at the end of the therapy.

Mental imagery: This intervention was held in ten 90-minute mental imagery sessions individually with meditation and gradual relaxation of muscles. In this technique, an individual visualizes arbitrary changes and ideal states mentally. This technique is individual and preference-based and can be implemented through different imaginations considered exciting and significant by an individual. For

instance, an individual can visualize pain as a melting pain that exits like droplets from fingertips. It is also possible to visualize the fight between immune cells and cancerous or viral cells as images of an attack by a flock of birds against rats. The first session was held to make acquaintance and communicate with patients through individual interviews. This session also included explaining treatment steps and methods used in a therapy session in addition to asking about the patient's feelings before and during the illness. The session also included sympathizing with the patient, analyzing the patient's conditions and problems, and making preparations for the process. After that, mental imagery exercises were conducted (by starting meditation in a peaceful environment, relaxing muscles gradually, and practicing mental imagery). The mental imagery exercise was practiced again at another time of the day. The second session was similar to the first session until the end. Finally, every patient's feedback was recorded.

Results

In terms of gender distribution, there were 7 females (46.7%) and 8 males (53.3%) patients in the cognitive behavioral therapy group, 7 females (46.7%) and 8 males (53.3%) patients in the mental imagery group and 8 females (53.3%) and 7 males (46.7%) patients in the control group. In terms of age distribution, 5 patients were under 30 years of age (33.3%), 4 patients were aged 31-40 years (26.7%), 4 patients were aged 41-50 years (26.7%), 1 patient was aged 51-60 years (6.7%) and 1 patient was over 60 years old (6.7%) in the cognitive-behavioral group. In the mental imagery group, 7 patients were under 30 (46.7%), 4 patients were aged 31-40 years (26.7%), 1 patient was aged 41-50 years (6.7%), 2 patients were aged 51-60 years (13.3%) and 1 patient was over 60 (6.7%). There was no significant difference between cognitive-behavioral, mental imagery, and control groups in terms of demographic variables such as age and gender. Table 1 shows the mean and standard deviation (SD) of hope and self-efficacy in the experimental and control groups in the pre-test and post-test.

To examine the difference between experimental and control groups in the post-test and to control the effect of the pre-test according to the research design, the first choice was the analysis of covariance (ANCOVA). Given that the normality of data distribution and the homogeneity of the variances are the main presuppositions of covariance analysis, the normality of the data showed that hope and self-efficacy have a normal distribution due to the non-significance of the Kolmogorov-Smirnov z-test. In addition, to examine the homogeneity of variances (equality of variances in experimental and control groups), Levene's test was used, which was F=1.39 and Pvalue=0.26 for hope and F=0.23 and Pvalue=0.79 for self-efficacy. Results showed that the assumption of homogeneity of variances is confirmed and the analysis of covariance is permissible. Furthermore, to examine the homogeneity of regression slopes, analysis of variance was used, which was F=1.06 and Pvalue=0.36 for hope and F=0.95 and Pvalue=0.40 for self-efficacy. This non-significant interaction showed that the homogeneity of regression slopes is met. Therefore, the assumption of homogeneity of regression slopes was confirmed. The non-significant assumption of homogeneity of covariance was examined using Box's test, which was F=1.28 and Pvalue=0.17 and the assumption was confirmed. Since the assumptions are met, ANCOVA could be used here. To this purpose, the effect of the independent variable on each of the dependent variables was examined using univariate ANCOVA.

As shown in table 2, the results of univariate ANCOVA were significant for all dependent variables (Pvalue<0.001). It was concluded that the independent variable has a separate effect on the dependent variables. To evaluate and compare the effect of each therapy on the dependent variables, the post hoc test was used.

As shown in table 3 there was a significant difference between the mean of the control group with cognitive behavioral therapy and mental imagery groups in terms of hope and self-efficacy (Pvalue<0.001); in other words, these interventions affected the hope and self-efficacy of cancer patients. However, no significant difference was observed between cognitive behavioral therapy and mental imagery intervention.

Table 1. Mean and standard deviation of the variables in experimental and control groups in pre-test and post-test

Dependent variable	Phases	CBT	Mental imagery	Control
		M±SD	M±SD	M±SD
Hope	Pre-test	121.13±19.61	120.66±24.40	119.31±27.79
	Post-test	182.00±14.06	189.33±21.45	116.46±25.43
Self-efficacy	Pre-test	64.60±10.97	68.86±12.22	66.23±12.28
	Post-test	95.40±5.84	98.33±6.14	63.69±9.47

Table 2. Results of ANCOVA on the post-test scores of the variables

Variables	SS	df	MS	F	Pvalue	η^2	Power
Hope	39717.19	2	19858.59	79.26	0.001	0.82	1.00
Self-efficacy	827.75	2	3413.88	87.45	0.001	0.83	1.00

Table 3. LST test for paired comparison of the hope and self-efficacy in the post-test phases

Variables	Groups	Mean difference	SE	Pvalue
Hope	CBT - Control	77.46	7.55	0.001
	Mental imagery - Control	80.51	6.72	0.001
	CBT - Mental imagery	3.05	6.45	0.640
Self-efficacy	CBT - Control	20.96	2.98	0.001
	Mental imagery - Control	33.87	2.65	0.001
	CBT - Mental imagery	2.90	2.54	0.260

Discussion

The present study aimed to investigate the effectiveness of cognitive-behavioral therapy and mental imagery on the hope and self-efficacy of patients with leukemia and lymphoma. This study indicated the effectiveness of cognitive-behavioral therapy on the hope level of cancer patients, which was consistent with the findings of the previous studies.[19,20] To explain this finding, we can say that the cognitive-behavioral approach gives individuals the insight that, although they cannot change definite life events, they can learn how to change the way of dealing with them. By training behavioral techniques such as relaxation, the cognitive-behavioral intervention helps patients to reduce stress. In addition, they improve and develop their communication skills, relations, and social activities. These relations help increase patients' level of hope. The cognitive intervention used in this study focused on problem-solving skills and training patients about automatic negative thoughts. By training them on how to correct the negative thoughts, it helped them to learn positive self-expression to apply them in real-life situations. This way, individuals acquire knowledge on the destructive effects of negative emotions in life using cognitive and behavioral techniques and they are motivated to increase their hope and decrease their negative emotions.[21] Hopeful people learn from bad events by focusing on them and using them to pursue future goals.

Based on another finding in this study, cognitive behavioral therapy was effective in the self-efficacy of patients, which was consistent with the previous findings in this regard.[10,11,22] To explain the effectiveness of cognitive-behavioral therapy in the self-efficacy of cancer patients, we can say that training cognitive behavioral assignments such as functional analysis and skills training and explaining negative emotions increases feelings of domination and empowerment in individuals, which is effective in boosting their therapeutic motivation and hope.[23] Cognitive-behavioral therapy for cancer patients allows them to learn the necessary coping skills to manage disease-induced stress while believing in an effective self-image and to gain the belief that they can control the situation.[24]

This study also showed that mental imagery was effective in the hope of leukemia and lymphoma patients, which is consistent with the findings of the previous studies.[13] To explain this, we can say that relaxation is generally a prerequisite and prelude to mental imagery, which is the main theme of human personality and behavior. Personality and behavior change as mental image changes. All our actions, feelings, behaviors, and even our abilities are shaped based on this mental image.[17] Mental rotation, mental screening, muscle relaxation, and cognitive reprocessing skills aim not only to think about a particular subject, image, and thought, but also to replace negative thoughts and images with positive ones. They play a major role in increasing psychological well-being and hope and reducing internal conflict. It seems that relaxation is the key to relieving stress, anxiety, and depression. In addition, by emphasizing the power of the mind and body, mental imagery assures individuals that they can control horrific events. Therefore, it plays a role in reducing stress and depression and increasing hope.

Another finding of the study indicated the effectiveness of mental imagery in patients' self-efficacy. Considering that no research was found on the effectiveness of mental imagery on patients' self-efficacy, results can be considered to be consistent with similar studies in this regard.[25] When individuals get into trouble, fail to achieve their goals, and lose their self-efficacy, mental imagery helps to remove obstacles. Mental images which are more clear and focused than words help change the direction of an individual's thinking. They combine stimuli and responses and convert knowledge and awareness into an emotional process. Therefore, individuals with mental imagery view events from a perspective different from their usual and conventional point of view. Just as mental images are visualized, they are compared with other mental images and evoke other associations, and they are used to create a completely new combination of images. Comparing, reviewing, correcting, and combining the images help individuals create useful images in their mind about how their world works based on possible chains of mental images, without being obliged to directly experience those events and their outcomes.[26] Therefore, mental imagery causes individuals to enjoy high self-efficacy and increase their self-image and beliefs in lifestyle.

Results of this study indicated no significant difference between the effectiveness of cognitive-behavioral training and mental imagery in the hope and self-efficacy of the patients under study. Due to the changes occurring in living conditions following cancer, patients encounter many complex problems. Cancer and all that arises from it, from diagnosis through treatment and hope of survival are considered a traumatic event. It is one of the most severe stressors a person may experience; these patients severely lose their hope and confidence in their ability to fight the disease. Since hope has a futuristic design with spiritual aspects and is considered an inner source to help people express and achieve positive goals and outcomes, especially in times of uncertainty, crisis or stress. Therefore, the two therapies had a similar effect on the patients' hope and self-efficacy due to the patients' high levels of frustration and feeling of inability to control the conditions.[27]

Results of this study suggest that the high disease-induced pressure and distress in such critical conditions necessitate the patients' receiving not only medicinal treatments but also such interventions to cope with the disease more effectively. This study had some limitations which should be considered when interpreting the results and generalizing them to other groups. It should be borne in mind that the participants were cancer patients; so further research is needed to generalize the results to other populations, such as normal people or those with other diseases. Sampling was another limitation of this study, which further limits its generalizability. In addition, due to the limitations caused by the COVID-19 pandemic and the loss and illness of some participants, it was not possible to assess the retention of therapy at follow-up, which is recommended for future research. About the major effect of medical services and care provided by medical organizations and the type of insurance coverage for families on the treatment process and psychological characteristics of patients, it is suggested to conduct a similar study on individuals while controlling their socio-economic status and the type of medical service they

receive. Given the effectiveness of these therapies, it is suggested to comprehensively and extensively apply them in medical centers along with medicinal treatments.

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Conflict of Interest

The authors declare that they have no conflict of interest.

References

1. Mendoza ME, Capafons A, Gralow JR, Syrjala KL, Suárez-Rodríguez JM, Fann JR, et al. Randomized controlled trial of the Valencia model of waking hypnosis plus CBT for pain, fatigue, and sleep management in patients with cancer and cancer survivors. Psychooncology 2017;26:1832-8. doi:10.1002/pon.4232

2. Khojaste Kashani A, Kooshki S, Kazemi AS, Khajev Khoshli A. Structural equation modeling of relationships between social support, self-efficacy, and quality of life in patients with heart failure. Int J Health Stud 2020;6:29-34. dx.doi:10.22100/ijhs.v6i3.776

3. Periyakaruppan M, Kumar S, Kandasamy S, Sangaralingam T, Srinivasan S, Thiagarajan A, et al. COVID Abdomen: SARS-CoV-2 infection presenting as 'Acute Abdomen' in a Child. Indian J Pediatr 2021;88:299-300. doi:10.1007/s12098-020-03508-4

4. Conway MF, Pantaleao A, Popp JM. Parents' experience of hope when their child has cancer: Perceived meaning and the influence of health care professionals. Journal of Pediatric Oncology Nursing 2017;34:427-34. doi:10.1177/1043454217713454

5. Hashemzadeh S, Borjali M, Hasani Abharian P. Biological stress indicators based on perceived stress mediated by emotional regulation among patients with gastrointestinal cancer: A structural equation modeling. Razavi International Journal of Medicine 2021;9:9-15. doi:10.30483/rijm.2021.254162.1016

6. Merluzzi TV, Pustejovsky JE, Philip EJ, Sohl SJ, Berendsen M, Salsman JM. Interventions to enhance self-efficacy in cancer patients: A meta-analysis of randomized controlled trials. Psychooncology 2019;28:1781-90. doi:1002/pon.5148

7. Baik SH, Oswald LB, Buitrago D, Buscemi J, Iacobelli F, Perez-Tamayo A, et al. Cancer-relevant self-efficacy is related to better health-related quality of life and lower cancer-specific distress and symptom burden among Latina breast cancer survivors. International Journal of Behavioral Medicine 2020;27:357-65. doi:10.1007/s12529-020-09890-9

8. Huguet A, Rao S, McGrath PJ, Wozney L, Wheaton M, Conrod J, et al. A systematic review of cognitive behavioral therapy and behavioral activation apps for depression. PLoS One 2016;11:e0154248. doi:10.1371/journal.pone.0154248

9. Hyland KA, Nelson AM, Eisel SL, Hoogland AI, Ibarz-Pinilla J, Sweet K, et al. Fatigue perpetuating factors as mediators of change in a cognitive behavioral intervention for targeted therapy-related fatigue in chronic myeloid leukemia: A pilot study. Ann Behav Med 2021. doi:10.1093/abm/kaab035

10. Teo I, Tan YP, Finkelstein EA, Yang GM, Pan FT, Lew HYF, et al. The feasibility and acceptability of a cognitive behavioral therapy-based intervention for patients with advanced colorectal cancer. J Pain Symptom Manage 2020;60:1200-7. doi:10.1016/j.jpainsymman.2020.06.016

11. Lang H, France EF, Williams B, Humphris G, Wells M. The existence and importance of patients' mental images of their head and neck cancer: A qualitative study. PLoS One 2018;13(12):e0209215. doi:10.1371/journal.pone.0209215

12. Sinha MK, Barman A, Goyal M, Patra S. Progressive muscle relaxation and guided imagery in breast cancer: a systematic review and meta-analysis of randomised controlled trials. Indian J Palliat Care 2021;27:336-44. doi:10.25259/IJPC_136_21

13. Whitaker KL, Brewin CR, Watson M. Imagery rescripting for psychological disorder following cancer: A case study. Br J Health Psychol 2010;15:41-50. doi:10.1348/135910709X425329

14. Charalambous A, Giannakopoulou M, Bozas E, Marcou Y, Kitsios P, Paikousis L. Guided imagery and progressive muscle relaxation as a cluster of symptoms management intervention in patients receiving chemotherapy: A randomized control trial. PLoS One 2016;11:e0156911. doi:10.1371/journal.pone.0156911

15. Miller JF, Powers MJ. Development of an instrument to measure hope. Nursing Research. 1988;37:6-10. doi:10.1097/00006199-198801000-00002

16. Abdi N, Asadi-Lari M. Standardization of three hope scales, as possible measures at the end of life, in Iranian population. Int J Cancer Manag 2011;4:e80732.

17. Merluzzi TV, Philip EJ, Heitzmann Ruhf CA, Liu H, Yang M, Conley CC. Self-efficacy for coping with cancer: Revision of the cancer behavior inventory (Version 3.0). Psychol Assess 2018;30:486-99. doi:10.1037/pas0000483

18. Karamoozian M, Kalantari Khandani B, Bagheri M, Dehghanifar F, Darekordi A. Assessing self-efficacy for coping with cancer: Psychometric analysis of the cancer behavior inventory (CBI). Iranian Journal of Breast Diseases 2019;12:8-20 doi:10.30699/ijbd.12.4.8

19. Zhang P, Mo L, Torres J, Huang X. Effects of cognitive behavioral therapy on psychological adjustment in Chinese pediatric cancer patients receiving chemotherapy: A randomized trial. Medicine (Baltimore) 2019;98:e16319. doi:10.1097/MD.0000000000016319

20. Sheikhzadeh M, Zanjani Z, Baari A. Efficacy of mindfulness-based cognitive therapy and cognitive behavioral therapy for anxiety, depression, and fatigue in cancer patients: A randomized clinical trial. Iran J Psychiatry 2021;16:271-80. doi:10.18502/ijps.v16i3.6252

21. Daniels S. Cognitive behavior therapy for patients with cancer. J Adv Pract Oncol 2015;6:54-6. doi:10.6004/jadpro.2015.6.1.5

22. Sun H, Huang H, Ji S, Chen X, Xu Y, Zhu F, et al. The efficacy of cognitive behavioral therapy to treat depression and anxiety and improve quality of life among early-stage breast cancer patients. Integr Cancer Ther 2019;18:1534735419829573. doi:10.1177/1534735419829573

23. Shahlapour S, Sedaghat M, Pashang S. Comparison of the Effect of Lazarus Multimodal Approach and Cognitive-Behavioral Therapy on Psychological Distress, Working Memory, and Anxiety in Patients with Multiple Sclerosis. Razavi International Journal of Medicine 2021;9:5-12. doi:10.30483/rijm.2021.254169.1022

24. Kucherer S, Ferguson RJ. Cognitive behavioral therapy for cancer-related cognitive dysfunction. Curr Opin Support Palliat Care 2017;11:46-51. doi:10.1097/SPC.0000000000000247

25. Pop CA, Tiba AI. Mental imagery, optimism, and self-efficacy: The role of imagery perspective and imagery modality in positive cognition. Romanian Journal of Applied Psychology 2019;21:35-43. doi:10.24913/rjap.21.2.01

26. Pearson J. The human imagination: the cognitive neuroscience of visual mental imagery. Nat Rev Neurosci 2019;20:624-34. doi:10.1038/s41583-019-0202-9

27. Conway MF, Pantaleao A, Popp JM. Parents' experience of hope when their child has cancer: Perceived meaning and the influence of health care professionals. Journal of Pediatric Oncology Nursing 2017;34:427-34. doi:10.1177/1043454217713454