

ORIGINAL RESEARCH**Effectiveness of cognitive-behavioral group therapy in quality of life and hope among patients with multiple sclerosis**

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Abstract

Introduction: The present study was aimed at investigating the effectiveness of cognitive-behavioral group therapy in quality of life and hope among patients with multiple sclerosis (MS).

Materials and Methods: In this clinical trial, using a quasi-experimental pretest-posttest control group design, 20 MS patients were selected through available sampling among the patients in Mashhad Multiple Sclerosis Association in 2016 and were randomly assigned into two experimental and control groups, each containing 10 subjects. The experimental group underwent cognitive-behavioral group therapy in 10 weekly sessions of 2 hours and the control group did not receive this treatment. In the pretest and posttest, Quality of Life Questionnaire-Short Form (SF-36) and Snyder Adult Hope Scale (AHS) were implemented on all the subjects of the experimental and control groups. Data was analyzed using analysis of covariance and t-test.

Results: The results demonstrated that cognitive-behavioral group therapy significantly leads to increased overall index of quality of life and hope ($p < 0.001$) in the experimental group compared to the control group. Further, out of quality of life components, dimensions of physical function, role limitation due to physical problems, fatigue or vitality, emotional health and general health of the experimental group showed a greater increase at the end of the intervention relative to the control group ($p < 0.001$) and concerning other subscales, the difference between the two groups was not significant.

Conclusion: Cognitive-behavioral group therapy results in enhanced quality of life and hope in patients with multiple sclerosis.

Keywords: Multiple sclerosis, Cognitive-behavioral, Group therapy, Quality of life, Hope

Introduction

Multiple sclerosis (MS) is developed in the central nervous system (CNS) due to the inflammation and degeneration of the nerve myelin sheath and is largely prevalent among people aged 18 to 45 years and affects the patient's individual and social performance. In 2006, American National Multiple Sclerosis Society (NMSS) estimated MS prevalence around 400,000 people in the United States and over 2 million people worldwide [3]. According to Iranian Multiple Sclerosis Society in 2013, there are about 70,000 patients with MS [4]. Chiaravalloti and Deluca [5] found that psychological problems are the main cause of disabilities, social damages and low quality of life in MS patients.

The optimal quality of life does not mean the absence of disease but indicates feeling good in a variety of psychological, social, functional and mental fields [6]. Health-related quality of life includes the value that the individual attaches to his life despite the effect of illness, injury or treatment on his actions, perceptions and social opportunities.

Results of the research by Rausak et al. [8] indicated that MS patients' quality of life, especially in older people with a secondary progressive course of the disease, is significantly low. MS patients significantly have lower quality of life compared to general population and people with other chronic diseases [10]. The quality of life and components of optimism and self-efficacy are among the variables affecting the perception of disease in patients with MS [11]. Results of a study [12] suggested that there is a significant correlation between health behaviors such as nutrition, stress management, physical activity, positive interpersonal relationships and spiritual growth with quality of life.

One of the important concepts in the context of quality of life and the positive psychological approach is the concept of hopefulness. Hope is defined as the "ability to design passages to target goals in spite of the existing barriers and agency or the necessary motive for using these passages" [13]. Hope can facilitate the coping process [14, 15], increase improvement [16, 17] and enhance

the quality of life and treatment of patients [18]. In the study by Sho'a' Kazemi and Mo'meni Javid [19], it was demonstrated that there is a significant positive relationship between quality of life and life expectancy among female cancer patients. Results of the research conducted by Snyder and Anderson [20] revealed that enhanced hope is effective in improving the quality of life and promoting the self-care level and general health of patients with chronic physical disorders. Rasouli et al. [21] carried out a study on 24 MS patients and indicated that hope therapy simultaneously improves hopefulness and quality of life of these patients.

After being aware of their diagnosis, MS patients may lose their hope and ability to adapt to the conditions of their disease due to the debilitating symptoms of the disease and this factor causes them not to pay sufficient attention to their treatment and not take the doctors' instructions seriously. They do not make much effort to improve their health condition and thereby worsen their health status [22].

Through challenging negative automatic thoughts and identifying and correcting the individual's cognitive errors, cognitive-behavioral therapy provides an opportunity for the patient to accept his disease and face it reasonably. Further, by changing the cognitions and modifying the irrational beliefs of the individual, his attitude to self, world and future is transformed and subsequently, the patient can adopt a new and flexible perspective instead of focus on disabilities and hopelessness about the future [23]. Several studies have shown the effectiveness of cognitive-behavioral group therapy in reduced psychological distress and symptoms of depression and anxiety in chronic medical disorders, including diabetes (24), chronic pain (25), AIDS (26), heart disease (27) and hepatitis B (28). This treatment effectively decreases the symptoms of insomnia, fatigue, stress, anxiety and depression of most MS patients (29-32). Casio et al. [33] showed the effectiveness of cognitive-behavioral therapy in improved symptoms of depression and quality of life among 127 MS patients. In the study by Van Cassel et al. [34], the results obtained from cognitive-behavioral group

therapy compared to relaxation therapy (RT) suggested that cognitive-behavioral therapy leads to a more significant improvement in fatigue, depression, anxiety and stress of MS patients.

Regardless of how much MS treatment is effective for the patient, patients, their families and experts agree on this point that living with this disease is very difficult and disappointing in physical and mental terms [35]. Such a process can have adverse consequences in various individual, family, social and occupational aspects of the patient. Thus, given the impact of psychological factors on chronic diseases and the role of chronic diseases such as MS in exacerbating psychological problems and considering the effectiveness of cognitive-behavioral interventions in patients with various chronic diseases, it seems that cognitive-behavioral group therapy can improve the quality of life and increase hopefulness in MS patients. Therefore, the present study aims to investigate the effectiveness of cognitive-behavioral group therapy in promoting the quality of life and hopefulness of patients with multiple sclerosis.

Materials and Methods

The present research was a quasi-experimental study with a pretest-posttest control group design, which lasted from September to November 2016. Of the research statistical population including all MS patients with a file in Mashhad Multiple Sclerosis Society, 20 patients with inclusion criteria were selected using purposive and available sampling method and were randomly assigned into two experimental and control groups. The inclusion criteria were as follows: Age between 20 and 50 years, having a minimum degree of diploma and written consent for participation in the research. The exclusion criteria included the following: Being in the acute phase of the disease so that there is no physical ability to attend the sessions, heart or brain attack, severe depression and drug addiction and existence of other neurological disorders such as epilepsy. Before implementing the intervention process, a meeting was held with members of the two groups in which the goals of the plan were explained to all patients and the necessary

assurance was given to them about the confidentiality of information as well as the possibility of discontinuation of treatment whenever the patient wishes so. The sessions were held once a week (2 hours) over 2 months and a half for the subjects of the experimental group, and the control group was only asked to attend the pretest and posttest and remain on the waiting list to receive treatment. The content of cognitive-behavioral group therapy sessions [36] is presented in table 1.

Research tools

Quality of Life Questionnaire-Short Form (SF-36)

This questionnaire is a general tool for measuring health status and quality of life which can be applied to evaluate health status and quality of life associated with the health of normal and patient population groups. This questionnaire consists of 36 items in 8 dimensions of health including physical function (10 items), role limitation due to physical problems (4 items), role limitation due to emotional problems (3 items), fatigue or vitality (4 items), emotional health (5 items), social function (2 items), physical pain (2 items) and general health (5 items). Question number 2 does not belong to any dimension and is added to the total score. The way to score is determined by the number of options for each item. A score between zero (worst condition) and 100 (best condition) is assigned to each item. The total score of the questionnaire varies from 0 to 100 and the higher the score, the better the quality of life will be [37].

The internal consistency of the eight subscales of the questionnaire has been reported to be between 0.67 and 0.94 through Cronbach's alpha [38]. Validity and reliability of the Persian version of this questionnaire have been reviewed by Montazeri et al. [39]. In their research, reliability test of the questionnaire using the statistical analysis of "internal consistency" showed that except for the vitality scale ($\alpha=0.65$), other scales enjoy minimum standard reliability coefficients within the range of 0.77 to 0.9. The statistical test of "known-groups comparison"

demonstrated that the Persian version of SF-36 is able to distinguish demographic subgroups by gender and age.

Adult Hope Scale (AHS)

This self-assessment questionnaire developed by Snyder et al. in 1991 for the measurement of hope includes twelve 8-option questions (from totally agree to totally disagree). The test scores range between 8 and 64. Score 8 indicates the lowest level of hope and score 64 represents the highest level of hope. Cronbach's alpha of the test ranged from 0.74 to 0.84 in 6 samples from college graduates and 2 samples from individuals under psychological treatment. Test-retest coefficient of the questionnaire is 0.80 and in courses of more than 10 weeks, it is higher than this amount [40]. Coordination of questions in this

scale with Snyder's hope theory suggests its good content validity. Correlation of this questionnaire with Beck Hopelessness Scale is -0.51 and its correlation with Beck Depression Inventory is -0.42, which indicate the concurrent validity of this questionnaire [41]. In the study performed by Ghobari et al. [42] on student population of Iran, reliability of this test was calculated to be 0.82 using Cronbach's alpha. In another study conducted by Kermani et al. [43] on 371 students in Tehran, Cronbach's alpha coefficient was obtained to be 0.86. In Khalaji's [44] research, reliability of this scale was 0.70 through Cronbach's alpha and 0.74 using test-retest after one month.

For data analysis, independent group t-test and one-way analysis of covariance (ANCOVA) were used in SPSS-22.

Table 1: Content of cognitive-behavioral group therapy sessions

Introductory session: Preparing and determining group structure, defining goals, discovering expectations, creating group cohesion and coping with the initial anxiety of group members.
First session: Introducing the cognitive-behavioral approach to emotional disorders particularly depression and anxiety, describing the biopsychosocial model of emotional disorders, eliminating resistance to treatment. Home assignment: Completing the sheets for the biopsychosocial model.
Second session: Reviewing the previous session's assignment, teaching the relationship between activities and mood states including sadness and feeling of hopelessness, using behavioral interventions to modify behaviors for improving the mood, providing feedback and reinforcement to group members, facilitating interactions within the group. Home assignment: Completing the activity program and mood rating.
Third session: Reviewing the previous session's assignment, examining the outcomes and consequences of behavioral modifications, determining "mood changes" targeted by cognitive interventions, naming and rating the emotions experienced in the existing tough situations by examples. Home assignment: Completing the first two columns of the thought record sheet (situations and emotions).
Fourth session: Reviewing the previous session's assignment, describing and interpreting "self-talk" as a relationship between the situation and the emotion by the patient's examples, examining automatic thoughts and focusing on the thoughts that have the greatest relationship with emotion, introducing a technique for providing evidence, identifying and evaluating the existing evidence about automatic thoughts. Home assignment: Completing the first four columns of the thought record sheet.
Fifth session: Reviewing the previous session's assignment, introducing "opposite evidence" through

the patient's questions and examples, introducing a list of "intellectual distortions" along with examples. Home assignment: Completing the first seven columns of the thought record sheet and determining intellectual distortions.

Sixth session: Reviewing the previous session's assignment, introducing alternative thoughts, applying problem-solving about alternative thoughts. Home assignment: Completing thought record sheets.

Seventh session: Reviewing the previous session's assignment, bringing up behavioral experiments, designing an experiment consistent with the patient's example or case, teaching the imaginal exposure technique to reduce anxiety from social situations and thus increase quality of life. Home assignment: Doing a test and reviewing its results and consequences.

Eighth session: Reviewing the previous session's assignment, introducing deep cognitions, the concept of conditional assumptions and core and important beliefs, using downward arrow technique. Home assignment: Doing the downward arrow exercise.

Ninth session: Reviewing the previous session's assignment, explaining the relationship between conditional assumptions and core beliefs through spectrum model, introducing the coping strategies related to core beliefs, training problem-solving. Home assignment: Applying alternative coping strategies and monitoring its outcomes.

Tenth session: Reviewing the previous session's assignment, strengthening changes, discussing the use of skills learned in the group in everyday situations, follow-up and post-treatment evaluation, conclusion.

Results

20 MS patients participated in the present study. In the experimental group, there were 7 male patients and 3 female patients and in the control group, 6 male patients and 4 female

patients were present. Table (2) displays descriptive indicators of age and data from implementing SF-36 and AHS questionnaires in the pretest and posttest for each of the experimental and control groups.

Table 2: Mean and SD of the research variables in the pretest and posttest for both groups

Variables	Groups	Pretest		Posttest	
		Mean	SD	Mean	SD
Age	Experimental	33.52	5.21		
	Control	34.9	6.08		
Physical function	Experimental	61.55	23.16	69.95	29.44
	Control	62.66	27.43	60.35	24.3
Role limitation due to physical problems	Experimental	41.8	30.19	51.26	33.1
	Control	41.7	28.37	43.64	24.78
Role limitation due to emotional problems	Experimental	61.99	29.49	63.9	27.4
	Control	60.35	29.33	61.34	26.7
Fatigue or vitality	Experimental	59.07	28.87	71.3	29.61
	Control	60.34	30.76	60.67	28.78
Emotional health	Experimental	55.05	26.67	64.55	29.5
	Control	57	28.3	57.67	28.76
Social function	Experimental	66.88	27.97	65.95	27.45

	Control	65.95	28.6	66.2	27.67
Physical pain	Experimental	47.17	20.2	48.42	21.18
	Control	48.41	19.37	46.7	18.78
General health	Experimental	60.87	22.39	71.34	24.5
	Control	58.35	23.1	60.85	21.41
Overall quality of life	Experimental	56.8	29.67	63.33	30.5
	Control	56.84	28.3	57.18	29.55
Hope	Experimental	20.3	6.58	24	5.88
	Control	19.3	5.5	19.9	4.18

In Table (3), results of t-test to compare pretests and homogeneity of variances test and regression slope as presumptions of doing the analysis of covariance have been provide.

Table 3: Comparison of means in the baseline and analysis of covariance assumptions

Variables	Comparison of means in the pretest		Homogeneity of variances assumption		Homogeneity of regression slopes assumption	
	t	Significance level	F	Significance level	F	Significance level
Physical function	1.45	0.164	0.98	0.33	3.5	0.072
Role limitation due to physical problems	0.19	0.85	0.11	0.74	3.2	0.084
Role limitation due to emotional problems	1.78	0.112	0.33	0.57	3.11	0.078
Fatigue or vitality	1.33	0.176	1.21	0.141	2.25	0.168
Emotional health	1.74	0.116	1.39	0.119	2.84	0.123
Social function	1.19	0.211	1.1	0.178	3.36	0.073
Physical pain	1.08	0.263	0.57	0.412	0.87	0.357
General health	1.68	0.127	1.88	0.073	2.90	0.116
Overall quality of life	0.35	0.731	0.82	0.372	0.84	0.368
Hope	0.85	0.406	0.09	0.765	3.4	0.076

Results of table (3) indicate that the two groups are similar in the pretest and homogeneity of variances and homogeneity of regression slope assumptions are established. Thus, ANCOVA was employed to measure the

effectiveness of cognitive-behavioral group therapy in MS patients' quality of life and hope. Analysis of covariance results to compare the experimental and control groups in the research variables after removing the pretest effects have been presented in Table (4).

Table 4: Summary of the results of the analysis of covariance test to investigate the impact of cognitive-behavioral group therapy on quality of life and hope

Variables	Sum of squares	Degree of freedom	Mean square	F value	Significance level	Effect size
Physical function	1385.25	1	1387.25	4.47	0.048	0.21
Role limitation due to physical problems	5317.87	1	5317.87	5.13	0.037	0.23
Role limitation due to emotional problems	2634.3	1	2634.3	3.82	0.067	0.18
Fatigue or vitality	1490.76	1	1490.76	4.44	0.049	0.20
Emotional health	840.03	1	840.03	5.92	0.026	0.26
Social function	4.98	1	4.98	0.01	0.928	0.00
Physical pain	1.52	1	1.52	0.01	0.944	0.00
General health	1874.6	1	1874.6	10.33	0.005	0.38
Overall quality of life	9905.14	1	9905.14	35.8	0.001	0.68
Hope	61.4	1	61.4	11.28	0.004	0.53

Analysis of covariance results suggest that cognitive-behavioral group therapy leads to increased hope and improved overall quality of life in the dimensions of physical function, role limitation due to physical problems, fatigue or vitality, emotional health and general health of MS patients. However, comparison of the two groups in the dimensions of role limitation due to emotional problems, social function and physical pain is

not significant. Additionally, the effect size about overall quality of life and hope is greater than other cases.

The following diagrams visually show changes in the scores of the research variables for the experimental and control groups. Accordingly, it can be observed that in the experimental group compared to the control group, the changes in the posttest scores are greater than the pretest scores.

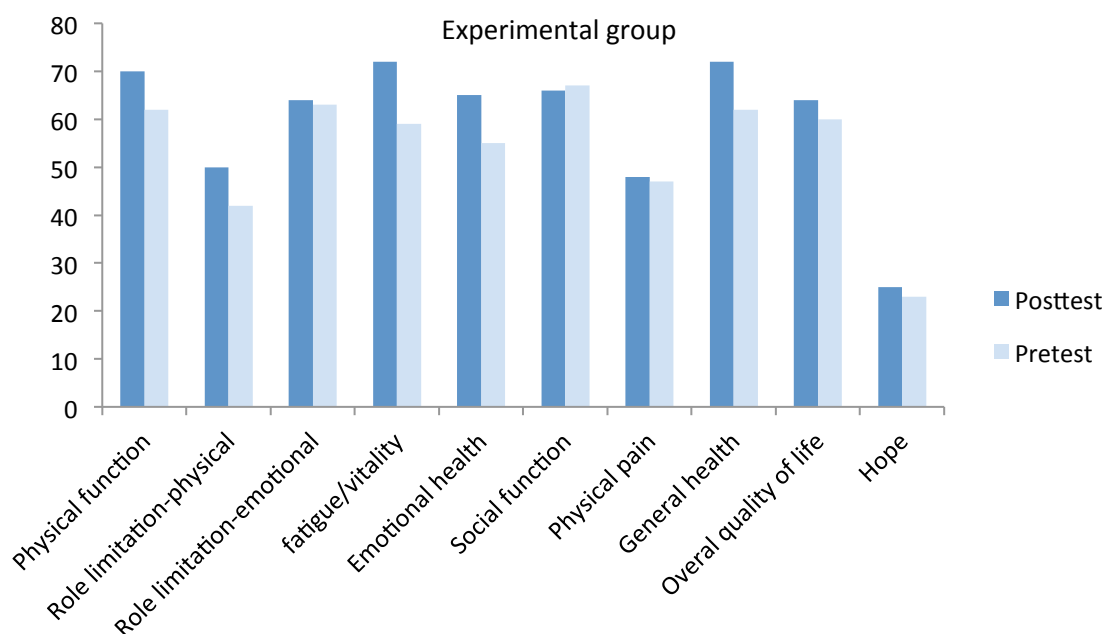


Chart 1: Mean pretest and posttest scores of hope and quality of life dimensions of the subjects in the experimental group

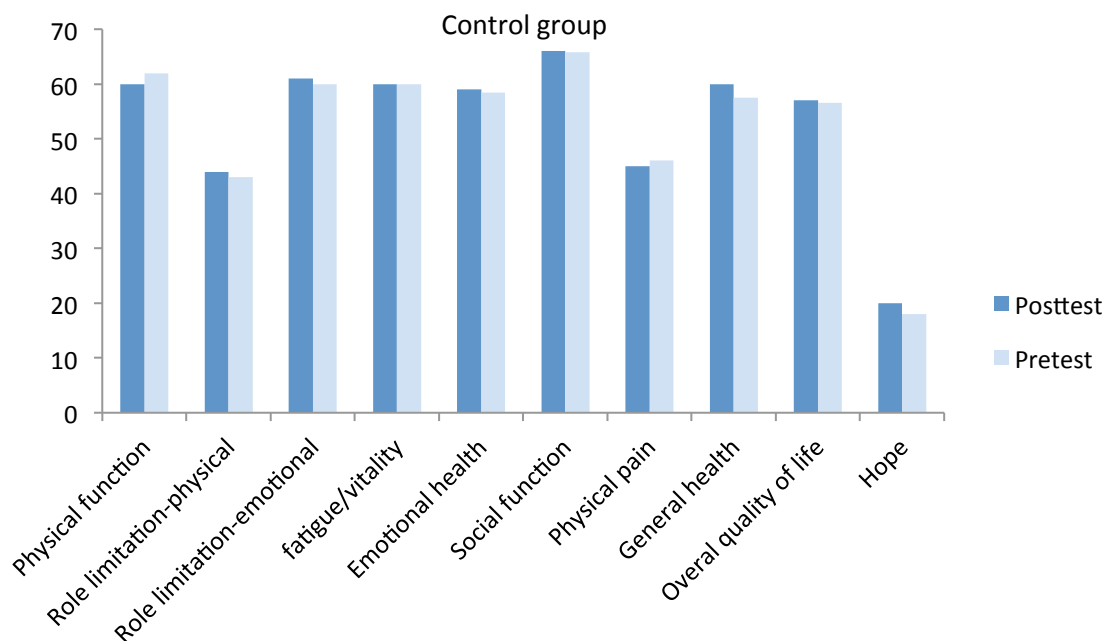


Chart 2: Mean pretest and posttest scores of hope and quality of life dimensions of the subjects in the control group

Discussion

This study was aimed at investigating the effectiveness of cognitive-behavioral group therapy in quality of life and hopefulness of MS patients. The research results demonstrated that after attending cognitive-behavioral group therapy sessions, the overall quality of life and hope increased. Dimensions of physical function, role limitation due to physical problems, fatigue or vitality, emotional health, general health and quality of life of patients with multiple sclerosis improved. However, no improvement was observed in the dimensions of role limitation due to emotional problems, social function and physical pain. These findings are relatively consistent with the results of other studies performed on the effectiveness of the cognitive-behavioral group therapy in MS disease [50].

In a randomized and controlled clinical trial, Gerasino et al. [46] evaluated the effectiveness of cognitive-behavioral group therapy in 82 MS patients and concluded that the experimental group relative to the control group had a significant improvement in quality of life, psychological well-being and self-efficacy. This result persisted for up to 6 months after treatment. In another study on 37

MS females, Sinclair and Scrougi [47] found that cognitive-behavioral interventions significantly improve the quality of life and mental health of patients. In explaining the results of the present research, it can be stated that teaching the main components of cognitive-behavioral therapy, such as replacing thoughts with rational beliefs, visualization, exposure and cognitive restructuring, can reduce anxiety and depression and ultimately improve the quality of life in MS patients.

In this study, cognitive-behavioral group therapy did not have any significant effect on role limitation due to emotional problems, social function and physical pain in MS patients. Results of this research are consistent with the findings of some of the previous studies and incongruent with some other. The obtained results concerning the effectiveness of cognitive-behavioral therapy in depression of MS patients reveal that this treatment makes no impact on physical complaints and symptoms of these patients. This finding is implicitly consistent with the results obtained in the study by Mokhtari et al. [48]. In the research carried out by Hoseini [49], cognitive-behavioral group therapy was used to reduce depression in MS patients. The

results suggested that the subjects in the experimental group compared to the control group had a significant reduction in depression and an increase in mental health and social function. In explaining the insignificance of the effect of cognitive-behavioral group therapy on the dimensions of role limitation due to emotional problems, social function, physical pain of MS patients in this study, it can be mentioned that since some physical symptoms associated with MS disease are caused by the destruction of the central nervous system structure, it cannot be expected that all of the physical symptoms of these patients have a psychological origin and improve under the influence of psychological interventions. MS patients experience repeated attacks during their illness and their physical condition is not under their control. Besides, they experience high levels of anxiety and depression [9]. These disorders along with other factors can interfere with the effectiveness of the treatment. One of the possible explanations that can be provided for this finding is the short duration of cognitive-behavioral group therapy, which prevents the possible impact of this approach on improved dimensions of role limitation due to emotional problems, social function and physical pain of MS patients.

Results of the present study also indicated that cognitive-behavioral group therapy significantly increased hopefulness in patients suffering from MS. This finding is consistent with the results obtained from the studies by Omrani et al. [50], Aqa Baqeri et al. [51] and Qara' Zibaei et al. [52]. The research by Omrani et al. [50] on 30 MS patients revealed that 12 sessions of cognitive-behavioral group intervention have a significant effect on enhanced hopefulness in MS patients. In the study by Aqa Baqeri et al. [51] in which mindfulness-based cognitive group therapy was used to increase mental well-being and hope in MS patients, the results demonstrated that the mean scores of mental well-being and hope of the subjects in the experimental group significantly increased compared to the control group. In another study carried out by Qara' Zibaei et al. [52], it was revealed that meaning-centered group therapy has a significant impact on reduced perceived stress and increased life expectancy in MS patients.

Hence, it seems that both meaning-centered therapy and cognitive-behavioral therapy on a group basis can be helpful for MS patients. According to the findings achieved by Rasouli et al. [21], given that enhanced hopefulness has a direct impact on improved quality of life in MS patients, it seems that teaching cognitive components such as cognitive restructuring, re-structuring of negative emotions, problem-solving training and the use of efficient coping strategies, positive mental imagery and psychological relaxation can decrease depression and anxiety and thus increase hopefulness and quality of life in MS patients.

Overall, results of the present study indicate the effectiveness of cognitive-behavioral group therapy in quality of life and hope among MS patients. However, this research was subject to certain limitations. Use of the available sampling method and the small number of subjects will limit the generalizability of the results. Moreover, it is not clear that the results remain stable over time due to the lack of follow-ups. Performing the research on wider samples and following the therapeutic effects can help to generalize the results and confirm the stability of findings over time. Further, considering the importance of hope and quality of life in different areas of life and their key role in mental health, it is suggested that in multi-group research projects, results of cognitive-behavioral group therapy be compared with third-wave therapies such as metacognition and treatment based on commitment and acceptance or combined approaches be used in treatment.

Conclusion

Based on the results of the present study, cognitive-behavioral group therapy can lead to enhanced quality of life and hope among MS patients. Patients with MS should reconsider their life programs and face recurrent disease relapses and lack of autonomy which cause frustration and worry. Group cognitive-behavioral approach leads to improved quality of life, increased hope and activation of patients by helping the patient share his problems and receive effective exposure strategies from the group members, challenging negative thoughts and idealistic beliefs and using distraction, problem-solving

and behavioral strategies. Thus, this low-cost and short-term treatment can be applied in all centers for the protection of MS patients.

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Conflict of interests

Authors declare no conflict of interest.

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