



Quality of life and depression in patients with Parkinson's disease: effectiveness of group cognitive-behavioral therapy: a randomized controlled study

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Background: Group cognitive-behavioral therapy has demonstrated its effectiveness in treating various psychological disorders. Nevertheless, there is insufficient evidence supporting its application in enhancing both the quality of life and depression among Parkinson's patients. Consequently, this study was undertaken to examine the efficacy of group cognitive-behavioral therapy in ameliorating depression symptoms and enhancing the quality of life in individuals afflicted with Parkinson's disease.

Materials and methods: A randomized clinical trial with pre-test and post-test measurements, including a control group, was conducted. The sample consisted of individuals referred to Roozbeh Hospital in Tehran with Parkinson's disease in 2023. Ninety participants were selected using convenience sampling and randomly assigned to either an experimental or a control group, with 45 participants in each. The experimental group received a three-month cognitive-behavioral therapy intervention consisting of 12 sessions of 90 min. Pre-test and post-test measures included the Beck Depression Questionnaire and the World Health Organization Quality of Life Questionnaire. Data analysis was performed using multivariate analysis of covariance (MANCOVA) in SPSS-25.

Results: The results revealed a significant difference between the experimental and control groups in terms of depression and quality of life. The cognitive-behavioral therapy intervention significantly reduced depression and significantly improved the quality of life in individuals with Parkinson's disease ($P \leq 0.01$).

Conclusion: Group cognitive-behavioral therapy can be an effective approach for reducing depression and improving the quality of life in individuals with Parkinson's disease. Therefore, therapists and healthcare providers can utilize cognitive-behavioral therapy to enhance the well-being of individuals with Parkinson's disease.

Keywords: depression, group cognitive-behavioral therapy, Parkinson's, quality of life

Introduction

Parkinson's disease is a neurodegenerative disorder that is considered the second most common disease of the central nervous system after Alzheimer's disease in this century. It is also one of the leading causes of disability in old age^[1]. The probability of developing Parkinson's disease increases with age and longevity.

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HIGHLIGHTS

- Mindfulness-based therapy is effective in increasing the tolerance of mothers of children with autism spectrum disorder.
- Tolerance can be a moderator between stressful events in life and mental health.
- People who have more tolerance have the ability to develop and develop a set of coping skills that support them in difficult situations.

Approximately 1.8% of people over 65 years of age suffer from this disease^[2]. Parkinson's is characterized by the degeneration of brain cells responsible for producing dopamine, which results in slow and progressive movement disorders^[3]. Additionally, cognitive and language changes have been observed in patients with Parkinson's disease. The most common symptoms of Parkinson's include tremors of hands and feet at rest, slowness of movements, stiffness, dryness of hands, feet, and body, and lack of balance^[4].

It is important to provide adequate care to people with Parkinson's, as their condition can lead to several problems^[5]. Parkinson's not only affects a patient's physical abilities but also causes emotional, psychological, social, and various other impacts on their quality of life^[6]. Quality of life is a broad term that encompasses a person's physical, psychological, cognitive,

social, cultural, and economic dimensions. In the physical dimension, a person's performance status is a crucial aspect^[7]. The quality of life is also influenced by a person's ability to perform daily activities such as self-care, going to school, and working at different stages of their life. Mental health is an essential aspect of a person's quality of life as it impacts their overall well-being and attitude towards life. In the social-cultural dimension, the roles and relationships of an individual in their family and society can significantly affect their quality of life^[8].

According to Dobkin *et al.*^[9]'s study, CBT was found to be effective in treating depression, and anxiety, and improving the quality of life of patients with Parkinson's disease. Berardelli *et al.*^[10]'s study also found that cognitive-behavioral group therapy was effective in treating depression and anxiety symptoms and reducing the severity of non-motor symptoms in people with Parkinson's. Another study conducted by Piers and colleagues showed that CBT was effective in treating depression in Parkinson's patients, with additional benefits for anxiety, apathy, learning, memory, and quality of life. The intervention was highly feasible and acceptable, and the improvement was largely maintained during follow-up^[4].

In recent decades, the cognitive-behavioral approach (CBT) has gained popularity among researchers and psychologists. CBT is a skill-focused, short-term therapy that aims to modify maladaptive emotional responses by changing thoughts, behavior, or both. This approach is based on the understanding that our cognitions, emotions, and behaviors have a significant effect on each other. Group-based CBT is a cost-effective alternative to individual therapy, especially for chronic physical patients. Many cognitive-behavioral models and treatment protocols have been developed for a wide range of mental disorders and chronic medical conditions, and clinical research has shown them to be effective. The study aimed to fill the gap in the existing literature by investigating the impact of group CBT on depression and quality of life specifically in individuals with Parkinson's disease. By demonstrating the effectiveness of this intervention, the study contributes to the development of targeted and tailored therapeutic approaches for individuals living with Parkinson's, ultimately aiming to improve their psychological well-being and overall quality of life. In light of this, the purpose of the current research is to investigate the effectiveness of cognitive-behavioral group therapy on depression and quality of life in Parkinson's patients.

Necessity of conducting the study

This study addresses a gap in the existing literature by investigating the effectiveness of group CBT, specifically in individuals with Parkinson's disease. While previous studies have examined the efficacy of CBT in treating depression and improving the quality of life in Parkinson's patients, few have focused on the specific impact of group therapy in this population. Therefore, this study fills the gap by exploring the effectiveness of group CBT as an intervention for individuals with Parkinson's disease.

By specifically targeting group therapy, this study provides valuable insights into the benefits and outcomes of a cost-effective alternative to individual therapy for individuals with Parkinson's disease. The findings of this study contribute to the body of knowledge on therapeutic approaches for managing depression and enhancing the quality of life in this patient population.

Additionally, the study employs a rigorous research design, utilizing a randomized clinical trial with pre-test and post-test measurements and including a control group. This methodological approach enhances the validity and reliability of the study's findings, strengthening the evidence base for the effectiveness of group CBT in Parkinson's patients.

Method

The present study utilized a randomized clinical trial with pre-test and post-test measurements and included a control group. The statistical population for this research consisted of all individuals diagnosed with Parkinson's disease and referred to Roozbeh Hospital in Tehran who provided informed consent to participate in the study. Through the use of convenience sampling, a total of 90 individuals were selected, with 45 participants being randomly assigned to each of the experimental and control groups. According to the medical records, patients with Parkinson's disease who visited the hospital and were diagnosed were selected and included in the study. Patients who had mild depression based on the Beck depression questionnaire were selected. The experimental group received a three-month cognitive-behavioral therapy intervention, consisting of 12 sessions of 90 min. All participants completed the Beck Depression Questionnaire and World Health Organization Quality of Life Questionnaire as pre-test and post-test measures.

Then the experimental group was trained in cognitive-behavioral therapy, while the control group was waiting to receive the intervention and did not receive this psychological intervention during the implementation of the research. This was while the people in both groups were continuing their drug treatment process. Therapeutic interventions were performed at Roozbeh Hospital in Tehran. After completing the training, they were given a post-test. The post-test included previous questionnaires. The reporting of this study conforms to the CONSORT statements. The flow diagram illustrating the enrollment of subjects into the study groups can be found in Figure 1.

Inclusion and exclusion criteria

Diagnosis of Parkinson's disease by both a psychiatrist and a neurologist, consent to participate in the research, absence of any acute or chronic physical illness as per the medical records, no use of psychiatric medications as per the medical records, minimal middle school education, use of specific medications for Parkinson's disease, and absence of acute and chronic psychotic illnesses such as depression as per the health records and counseling reports. The criteria for withdrawing from the research were having more than two absences, non-cooperation in completing the assigned tasks, and unwillingness to participate further in the research. Ethical principles were followed during the research, and participants were informed about the intervention program and all intervention steps. The control group was assured that they would receive the same interventions after the completion of the research process.

The details of the intervention in the experimental group were as follows^[11]:

During the research, the cognitive-behavioral therapy group sessions were structured in a specific way. In the first session, the group established rules and got to know each other. The importance of non-pharmacological treatments, particularly cognitive-

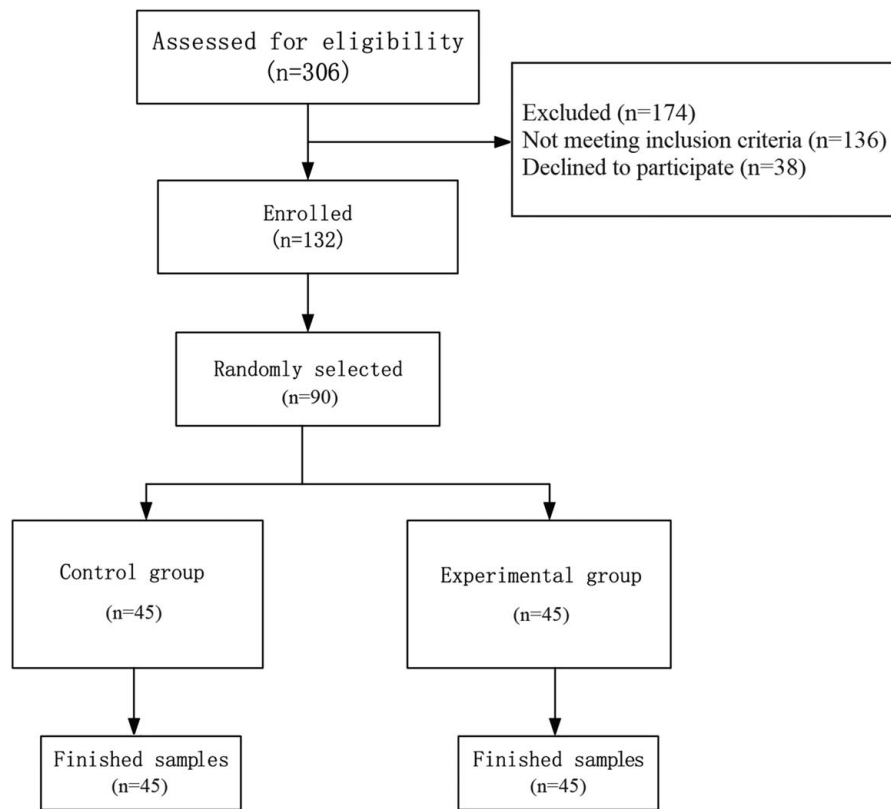


Figure 1. Study CONSORT diagram.

behavioral therapy, was discussed, and participants exchanged thoughts on how to lead a logical, healthy, and flexible life to manage life’s challenges. In the second session, functional analysis was introduced, and communication skills were taught to help develop personal and social characteristics. Additionally, participants learned about recognizing emotions and feelings and muscle relaxation exercises. The third session focused on clarifying and prioritizing goals, dealing with negative thoughts and feelings, and identifying positive skills, thoughts, and emotions that improve happiness and life satisfaction. The fourth session included discussions about life satisfaction, quality of life aspects, ways to obtain social support, anger management, and self-expression. In the fifth session, cognitive reconstruction was taught, and participants planned for daily positive activities. The sixth and seventh sessions focused on completing cognitive rehabilitation training and restructuring patients’ narratives. In the eighth and ninth sessions, patients’ narratives were reconstructed, and problem-solving skills were taught. The tenth ses-

sion involved discussing and exchanging opinions about the current narrative of patients. In the eleventh and twelfth sessions, participants applied problem-solving skills and identified a support program for psychological and social issues, examined their progress received feedback, and discussed the successful and unsuccessful aspects of treatment^[11]. Of course, before and after the intervention, both groups were evaluated in terms of depression and quality of life, and for this purpose, the following tools were used:

The researchers used Beck’s depression questionnaire to assess depression levels. The questionnaire consists of 21 items, each scored on a four-point Likert scale ranging from zero to three. Beck reported that the questionnaire has good predictive validity and a reliability score of 0.89, based on Cronbach’s alpha method^[12]. In Iran, many researchers have confirmed the reliability and validity of this tool. For instance, Jokar *et al.*^[13] reported a reliability score of 0.87 based on Cronbach’s alpha method and validated the tool’s efficacy with experts’ opinions.

Table 1
Frequency and percentage distribution of gender variables in control and experimental group.

Group	Sex (N)		Education (N)			
	Male	Female	Middle school diploma	Diploma	Post-graduate diploma	Bachelor’s degree
Experimental, N (%)	24 (53)	21 (47)	20 (45)	21 (47)	2 (4)	2 (4)
Control, N (%)	24 (53)	21 (47)	21 (47)	20 (45)	2 (4)	2 (4)

Table 2
Mean and standard deviation of pre-test and post-test of depression and quality of life of experimental and control groups.

Groups	N	Depression				Quality of life			
		Pre-test		Post-test		Pre-test		Post-test	
		M	SD	M	SD	M	SD	M	SD
Experimental	45	9.86	0.59	5.06	2.69	41.61	4.82	61.52	3.60
Control	45	9.45	0.74	8.87	1.40	42.70	4.65	44.35	4.50

To measure the quality of life, the researchers used the WHO's quality of life questionnaire, which comprises 36 items and is scored on a binary yes-no scale up to a six-point Likert scale. The World Health Organization reported a reliability score of above 0.70 for this tool in various countries. In Montazeri *et al.*^[15]s study, the tool's reliability was 0.75 based on a test-retest method with a two-week interval, and its validity was confirmed by experts.

It is worth mentioning that the collected data underwent analysis at both descriptive and inferential levels. Descriptive statistics, such as central tendency and dispersion indices, were used to analyze the data at the descriptive level. At the inferential level, multivariate covariance analysis (MANCOVA) was conducted using SPSS-25 to test statistical assumptions.

Results

The study included 90 randomly assigned patients with Parkinson's disease, divided equally into two groups. Before conducting multivariate covariance analysis on the data, the assumptions of this analysis were assessed. The results of Smirnov's Kolmogorov test for all variables did not show any significant deviations from normality, indicating that the assumption of normality is valid. Additionally, the M-box test and Levine's test yielded non-significant results, indicating that the assumptions of equal covariance matrices and equal variances across groups are valid.

According to the findings presented in Table 1, out of the total participants, 24 were male and 21 were female. In terms of education level, 20 individuals had a middle school education, 21 had a diploma, 2 had a post-graduate diploma, and 2 had a bachelor's degree.

Based on the results shown in Table 2, it can be observed that the experimental group had a lower average depression score (5.06 ± 2.69) compared to the control group, while the average quality of life score in the experimental group increased (61.52 ± 3.60) compared to the control group.

Table 3
Results of multivariate test for depression and quality of life.

Independent variable	Test	The amount of	F	Sig	Eta
Group therapy method	Pillai's Trace	0.395	25.81	0.0005	0.66
	Wilk's Lambda	0.404	25.81	0.0005	0.71
	Hotelling's Trace	0.876	25.81	0.0005	0.64
	Roy's Largest Root	0.976	25.81	0.0005	0.73

Sig., significance.

Table 4
The results of covariance analysis of cognitive-behavioral group therapy and control groups on depression.

Source	Sum of squares	df	Mean square	F	Sig.	Eta
Pre-test	185.276	1	185.276	41.442	0.0005	0.62
Group	29.584	1	29.584	6.148	0.0005	0.15
Error variance	148.712	27	5.507			

Sig., significance.

Table 3 displays the results of four tests, all of which indicate that the independent variable had a significant effect on the dependent variable. This implies that there are significant differences between the experimental and control groups in at least one of the variables of depression and quality of life ($P \leq 0.0005$). Consequently, to investigate the impact of cognitive-behavioral therapy on reducing depression in patients with Parkinson's disease, an analysis of covariance was conducted, controlling for the pre-test effect. The results of this analysis are presented in Table 3.

The findings from Table 4, which presents the results of the covariance analysis with pre-test control, demonstrate a significant effect of the group on post-test depression scores. Considering the eta square value, it can be inferred that 15% of the variance in depression scores can be attributed to the influence of the cognitive-behavioral therapy group. Thus, it can be concluded that cognitive-behavioral group therapy has effectively reduced depression in individuals with Parkinson's disease ($P = 0.0005$ and $F \leq 6.148$). Furthermore, to examine the impact of the cognitive-behavioral therapy group on improving the quality of life in Parkinson's patients, an analysis of covariance was conducted, controlling for the pre-test effect. The results are presented in Table 4.

Table 5 presents the findings of the analysis of covariance with pre-test control, revealing a significant effect of the group on post-test quality of life scores. Considering the eta square value, it can be inferred that 31% of the variance in quality-of-life scores can be attributed to the influence of the cognitive-behavioral therapy group. Therefore, it can be concluded that cognitive-behavioral group therapy has effectively increased the quality of life in patients with Parkinson's disease ($P = 0.0005$ and $F \leq 17.800$).

Discussion

People with Parkinson's disease often experience depression and a decline in their quality of life due to the stress associated with the condition. Therefore, it is essential to utilize therapeutic approaches in nursing and care practices for these individuals. This study aimed to examine the impact of cognitive-behavioral

Table 5
Results of covariance analysis of cognitive-behavioral group therapy and control groups on quality of life.

Source	Sum of squares	df	Mean square	F	Sig.	Eta
Pre-test	35621.216	1	35621.216	384.411	0.0005	0.82
Group	1771.263	1	1771.263	17.800	0.0005	0.31
Error variance	326.295	27	12.085			

Sig., significance.

group therapy on reducing depression and improving the quality of life in patients with Parkinson's disease.

The results of this research demonstrated a significant reduction in depression and a significant improvement in the quality of life of Parkinson's patients following cognitive-behavioral group therapy. These findings align with previous studies in the field, which have also reported the effectiveness of cognitive-behavioral interventions in reducing depression^[1,4,9,10,16-18] and improving the quality of life^[4,6,9].

For instance, Dobkin *et al.*^[9] found that cognitive-behavioral therapy was effective in treating depression, and anxiety, and enhancing the quality of life in patients with Parkinson's disease. Similarly, Berardelli *et al.*^[10] demonstrated the effectiveness of cognitive-behavioral group therapy in alleviating depression and anxiety symptoms and reducing non-motor symptom severity in individuals with Parkinson's disease. Another study by Piers and colleagues revealed that cognitive-behavioral therapy effectively treated depression in Parkinson's patients, with additional benefits in anxiety, apathy, learning, memory, and quality of life. The intervention was well-received by participants and resulted in sustained improvements during follow-up assessments^[4].

The effectiveness of cognitive-behavioral group therapy can be attributed to several factors. Adelman suggests that the interactive and feedback-rich nature of group therapy makes it particularly effective compared to other psychological treatment approaches for individuals with Parkinson's disease. Group participants realize that their experiences are shared by others, which reduces feelings of isolation and exacerbation of the disease^[9]. Furthermore, cognitive-behavioral group therapy offers various advantages to patients, including instruction in communication skills, relaxation techniques, goal setting, identification and replacement of negative thoughts and emotions with positive ones, anger management, self-expression, cognitive restructuring, daily activity planning, problem-solving, and identification of sources of support and positive feedback^[20-26].

In conclusion, the findings of this study provide evidence for the efficacy of cognitive-behavioral group therapy in reducing depression and enhancing the quality of life in patients with Parkinson's disease. These results are consistent with previous research and highlight the benefits of group therapy interventions in addressing the psychological well-being of individuals with Parkinson's. The interactive nature of group therapy and the range of skills and strategies it provides contribute to its effectiveness. Incorporating cognitive-behavioral group therapy into nursing and care practices can significantly benefit individuals with Parkinson's disease by improving their mental health and overall quality of life.

Conclusion

The study conducted in this research revealed that the implementation of cognitive-behavioral group therapy proved to be an effective approach in reducing depression and enhancing the quality of life among individuals diagnosed with Parkinson's disease. This therapeutic method holds great potential for counselors, clinical psychologists, and therapists who specialize in addressing the mental health needs of patients with Parkinson's disease. By incorporating cognitive-behavioral group therapy into their practice, these professionals can contribute significantly

to reducing depression and improving the overall quality of life experienced by individuals with Parkinson's disease.

It is crucial for mental health practitioners, including psychiatrists, psychologists, and physicians specializing in mental well-being, to familiarize themselves with the benefits and techniques of cognitive-behavioral group therapy. By acquiring and utilizing this therapeutic approach, they can offer effective interventions to individuals with Parkinson's disease, leading to a reduction in depressive symptoms and an enhancement in their quality of life.

Limitations of the study

The most important limitation of this research was not using the follow-up phase. Another limitation is the use of self-reporting tools. Many of these tools may collect answers that others think should be correct. People may not have enough self-esteem and not answer the questionnaires responsibly. Also, the limitation of the research population to people with Parkinson's referring to Roozbeh Hospital in Tehran was one of the limitations of this research. Therefore, it is suggested to use short-term and long-term follow-ups in future research to check the continuity of the effect of the intervention method. Also, in future research, the methods of this research can be compared with other methods such as metacognitive therapy, schema therapy, reality therapy, emotional rational therapy, etc. Another suggestion is that this research should be conducted in other groups, such as cancer patients, heart patients, epileptic patients, diabetic patients, etc. so that the generalization of the results and the effect of the cognitive-behavioral therapy group method can be discussed more accurately and confidently. Also, based on the findings, it is suggested that medical centers identify people with high depression and low quality of life and use cognitive-behavioral group therapy to improve their lives.

Ethical approval

This study was approved by the research ethics committee of Research Ethics Committees of Islamic Azad University- Science and Research Branch (ethical code: IR.IAU.SRB.REC.1402.155).

Consent

Written informed consent was obtained from the patient for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Author contribution

All authors contributed to the design and implementation of the study.

Conflicts of interest disclosure

The author declares no conflict of interest.

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Guarantor

All authors accept full responsibility for the study.

Data availability statement

Data are available from authors on request.

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