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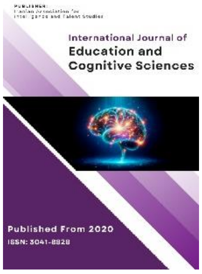

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Comparison of the Effectiveness of Acceptance and Commitment Therapy Group vs. Pharmacotherapy on Quality of Life in Parkinson's Patients

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ABSTRACT

Purpose: The present study aimed to determine the difference in the effectiveness of Acceptance and Commitment Therapy (ACT) group treatment versus pharmacotherapy on the quality of life among Parkinson's patients attending the Imam Reza Clinic, Neurology Department, in Shiraz.

Methodology: In this quasi-experimental study, 36 participants were purposefully selected and divided into two groups (each group = 18 participants). The tool used for assessment and diagnosis of disorders by the clinical specialist for sample selection was the Parkinson's Disease Quality of Life Questionnaire.

Findings: The findings confirmed the effectiveness of both ACT group therapy and pharmacotherapy on quality of life components, including mobility, activities of daily living, sleep/fatigue, emotional well-being, stigma, social support, cognitive problems/hallucinations, cognition, communication, bodily discomfort, gastrointestinal issues, mobility, activities of daily living, emotional well-being, and sexual function ($P<0.05$). The results indicated that the effectiveness of ACT group therapy was greater than pharmacotherapy, and this difference was statistically significant ($P<0.05$).

Conclusion: Therefore, it is suggested that centers dealing with Parkinson's patients utilize ACT group therapy to improve the aforementioned components, thereby enhancing the welfare of this group of patients.

Keywords: *Parkinson's, pharmacotherapy, quality of life, Acceptance and Commitment Therapy.*

1. Introduction

Parkinson's disease is a progressive neurological disorder characterized by the degeneration of dopamine-producing neurons in the midbrain (Lees, Hardy, & Revesz, 2009). This disease is primarily identified by motor symptoms such as tremors, muscle rigidity, bradykinesia, and postural instability (Poewe et al., 2017). However, Parkinson's patients often face non-motor challenges, including sleep disturbances, anxiety, depression, and cognitive problems (Chaudhuri, Healy, & Schapira, 2006). Due to the complexity and variety of symptoms, managing Parkinson's disease requires a multifaceted approach that includes both pharmacological and non-pharmacological treatments (Jankovic, 2008).

Parkinson's disease is a complex condition that significantly impacts patients' quality of life (Martinez-Martin et al., 2011). Quality of life is a multidimensional concept encompassing physical, psychological, and social aspects (Ferrans, Zerwic, Wilbur, & Larson, 2005). In Parkinson's patients, factors such as the severity of motor symptoms, the level of daily activities, and the presence of psychological issues like depression and anxiety can affect quality of life (Carod-Artal, Mesquita, Ziomkowski, & Martinez-Martin, 2013).

Conversely, pharmacotherapy is considered one of the main methods for managing Parkinson's symptoms (Olanow, Stern, & Sethi, 2009). Medications such as levodopa and dopamine agonists can significantly improve motor symptoms in patients (Fahn & Sulzer, 2004). However, long-term use of these medications is associated with side effects like dyskinesia and motor fluctuations (Schapira, 2009). Therefore, finding complementary and combined methods to improve the quality of life in Parkinson's patients is particularly important.

One therapeutic approach that has gained attention in recent decades is Acceptance and Commitment Therapy (ACT) (Hayes, Strosahl, & Wilson, 1999). This therapeutic approach emphasizes accepting mental experiences and committing to personal values, aiming to guide individuals towards a higher quality and more satisfying life (Harris, 2009). Studies have shown that ACT can be effective in reducing anxiety and depression symptoms and enhancing the quality of life in patients with chronic diseases (Graham et al., 2016).

Acceptance and Commitment Therapy (ACT) is a novel psychotherapy method that focuses on accepting mental experiences and committing to personal values, helping individuals move towards a meaningful life instead of trying to control or avoid unpleasant thoughts and feelings (Hayes et al., 1999). This therapeutic method is based on a six-process model of healthy psychological processes, including acceptance, cognitive defusion, being present, self-as-context, value clarification, and committed action (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). Research has shown that ACT can improve the quality of life and reduce psychological symptoms in patients with chronic diseases (Graham et al., 2016).

The aim of this study is to compare the effectiveness of ACT group therapy and pharmacotherapy on the quality of life of Parkinson's patients. The main hypothesis of this research is that ACT group therapy, given its comprehensive approach and attention to the psychological dimensions of the disease, can create greater improvement in the quality of life of Parkinson's patients compared to pharmacotherapy. This study also aims to examine potential differences in the effectiveness of these two therapeutic methods in reducing non-motor symptoms of Parkinson's disease, including anxiety and depression.

2. Methods and Materials

2.1. *Study Design and Participants*

The research method was semi-experimental with a pretest-posttest-follow-up design. The statistical population consisted of Parkinson's patients in Shiraz, and the research sample was selected from patients attending the Imam Reza Clinic, Neurology Department, Shiraz. The sample size was determined based on the sample size table for experimental studies (Cohen, 1986; as cited in Sarmaad et al., 1998), with 18 subjects per group, totaling 36 subjects for the two groups. According to Cohen's table, if two groups are studied and an effect size of 0.50 is considered at the 0.05 level, a minimum of 17 subjects per group is required to achieve a power of 0.89. To compensate for potential sample attrition, 24 subjects were initially assigned to each group, but during the therapy sessions, two subjects from the pharmacotherapy group and four from the ACT group were excluded based on specialist recommendations or due to withdrawal. Finally, considering invalid questionnaires and to maintain group homogeneity, the results of 18 subjects per group, totaling 36 subjects, were studied.

Inclusion criteria included patient consent to participate in the study based on a signed written consent form, physician approval, no medication use for one month before the test, no psychotic depression, no dementia, and meeting the diagnostic criteria for Parkinson's disease as determined by a specialist. Exclusion criteria included patient withdrawal from the study, physician disapproval of medication discontinuation, and the onset of psychotic symptoms.

After selecting the study samples as described in the sampling method, the groups were matched using the Unified Parkinson's Disease Rating Scale to determine the severity of Parkinson's disease in patients. After matching, subjects were randomly assigned to experimental and control groups. First, psychiatric medications used for non-motor symptoms were discontinued under specialist supervision for one month. Then, a pretest was conducted using the Parkinson's Disease Quality of Life Questionnaire for each group. After the pretest, the experimental design study began. In this study, the control group received medication for their symptoms, including antidepressants, anxiolytics, and other psychiatric medications prescribed by the specialist. To follow group psychotherapy principles, the experimental group was divided into two groups of 12, and the subjects underwent ACT group therapy in two 12-member groups simultaneously, conducted by two therapists over eight 90-minute sessions.

To measure the effectiveness of the treatments studied, a posttest was conducted after the therapy sessions. The posttest was also conducted using the Quality of Life Questionnaire, and subjects were re-evaluated using the same questionnaires three months later. In this study, pretests, posttests, and follow-up tests were conducted by the study therapists, but Parkinson's disease diagnosis and severity assessment were performed by a neurologist, and psychiatric disorder diagnosis and severity assessment were conducted by a clinical specialist using the standard mini-mental state examination for dementia. Group ACT therapy was conducted by therapists (researcher and research assistant) in both experimental groups.

2.2. *Measures*

2.2.1. *Quality of Life*

The Parkinson's Disease Quality of Life Questionnaire (PDQ-39) was used to assess the quality of life in Parkinson's patients. This questionnaire, developed by Jenkinson, is a self-report tool designed to better understand patients' subjective perceptions of clinical assessment. The Persian version of this questionnaire consists of 39 items divided into eight dimensions: mobility (10 items), activities of daily living (6 items), emotional well-being (6 items), stigma (4 items), social support (3 items), cognition (4 items), communication (3 items), and bodily discomfort (3 items). Each item is scored on a five-point Likert scale (1 indicating the best status = score 0, and 5 indicating the worst status = score 4) to measure the quality of life in Parkinson's patients. The reliability of this questionnaire, using the test-retest method (with a four-week interval), was reported to be 0.79 (Loo et al., 2010; Marinus et al., 2002; Martinez-Martin et al., 2007). The Cronbach's alpha coefficient for most domains was satisfactory, and good reproducibility for construct and criterion validity was demonstrated. Regarding validity, the items were developed based on in-depth interviews with patients rather than clinical scale literature. Overall, the questionnaire's validity is good, but items related to transfer, nighttime sleep problems, sexual desire, self-image, and role functioning are inadequate (Haponenmi et al., 2004; Marinus et al., 2002).

2.3. *Interventions*

2.3.1. *Acceptance and Commitment Therapy*

The treatment protocol was based on Toehig's ACT protocol (Toehig, 2007; Toehig et al., 2010) tailored for Parkinson's disease. The protocol consisted of eight 90-minute sessions, detailed in the appendix.

The first session started with discussing Parkinson's disease details, introducing the treatment method (using the two-mountain metaphor), and establishing a verbal contract for attending the eight therapy sessions. Patients were then asked how they discovered their illness and what actions they had taken so far, identifying effective and ineffective measures. The goal of this stage was "creative hopelessness" in treatment, reminding patients that their strategies only work temporarily, causing more symptoms.

The second session used metaphors like "the man in the hole" and "tug of war with a monster" to show how efforts to regulate inner experiences like symptoms are ineffective. The first metaphor described a man who fell into a hole (representing cognitive engagement with Parkinson's symptoms) and tried to dig his way out (representing efforts to reduce or control symptoms), only to deepen the hole. This metaphor aimed to reduce focus on controlling or trying to reduce obsessions. The second metaphor had patients imagine a tug-of-war with a giant (representing symptom management), trying to throw the giant into a pit, which sapped their energy and disrupted their function. The goal was to continue creative hopelessness.

Sessions three and four focused on demonstrating that efforts to control Parkinson's disease cause problems rather than solve them. These sessions included exercises to show the limitations of controlling personal events like depression, anxieties, and other symptoms, such as not thinking about something like a chocolate cake. These exercises help individuals understand the difference between uncontrollable personal events and controllable ones, shifting focus from symptom reduction to moving towards values and quality of life. The "two scales" and "polygraph machine" metaphors showed the potential benefits of accepting symptoms instead of trying to control or reduce them. These metaphors aimed to shift attention from reducing unpleasant personal events like anxiety and other symptoms to increasing the willingness to experience them. Willingness to experience symptoms allows emotions to flourish, while controlling symptoms paradoxically increases their frequency and intensity, enhancing their ability to control behavior.

Sessions five and six focused on changing the psychological function of Parkinson's symptoms from a threatening event to a mere verbal event, involving defusion, present moment contact, and self-as-context exercises. An example of a defusion exercise was repeating "Parkinson's" quickly until it lost its meaning (the "milk, milk" exercise). Present moment contact helps patients observe the world more directly and flexibly, not through their verbally evaluated rules. Present moment contact is encouraged through experiential exercises like "leaves floating on a stream," where thoughts and other experiences are seen as events floating on the water. This exercise aims to observe experiences in the present moment without struggling or evaluating thoughts or feelings, just watching them. The self-as-context exercise helps patients understand their thoughts as events that sometimes happen and sometimes do not, as experiences rather than personality traits. The "chessboard" metaphor, where the patient is the chessboard and the Parkinson's symptoms are the pieces, helps patients understand that the disease can exist without harming them, just as pieces do not harm the chessboard. Self-as-context helps patients experience themselves beyond their inner experiences as an observing individual.

Sessions seven and eight involved explaining patients' values and increasing behavioral commitments for a more sustainable life ("the squatter on the doorstep" metaphor). Finally, patients were helped to apply learned exercises like acceptance, present moment contact, cognitive defusion, self-as-context, and engaging in valued activities to prevent symptom recurrence.

2.3.2. Pharmacotherapy

Medication was prescribed and used by patients under specialist supervision, tailored to their symptoms.

2.4. Data Analysis

Data analysis in the quantitative section included descriptive and inferential parts. Descriptive statistics methods such as frequency, mean, and standard deviation were used to describe the obtained information. Additionally, repeated measures analysis was used to determine the presence or absence of differences between variables. SPSS-27 software was used to analyze the questionnaire data.

3. Findings and Results

Descriptive indices (mean and standard deviation) of quality of life scores in the Acceptance and Commitment Therapy (ACT) and pharmacotherapy groups at the pretest, posttest, and follow-up stages are presented in Table 1.

Table 1

Means and Standard Deviations of Quality of Life Components by Assessment Stage in Each Group

Variable	Index	Pretest ACT	Posttest ACT	Follow-up ACT	Pretest Pharmacotherapy	Posttest Pharmacotherapy	Follow-up Pharmacotherapy
Mobility	Mean	9.39	17.64	11.78	11.33	18.24	14.06
	SD	2.95	3.91	3.06	3.25	4.35	3.24
Activities of Daily Living	Mean	9.67	14.24	11.39	10.00	13.19	11.44
	SD	4.81	4.60	5.25	3.82	4.11	4.03
Emotional Well-being	Mean	8.22	14.17	13.25	10.47	11.21	10.38
	SD	2.56	3.42	2.84	2.75	2.87	2.89
Stigma	Mean	5.72	9.61	8.69	5.50	5.44	6.07

	SD	2.74	2.64	3.10	2.75	3.01	3.15
Social Support	Mean	3.17	5.50	4.75	3.50	3.67	3.99
	SD	1.29	1.69	1.65	1.25	1.53	1.36
Cognition	Mean	4.50	7.61	6.56	4.72	5.22	5.09
	SD	1.47	2.35	2.19	1.84	2.12	1.66
Communication	Mean	4.06	6.94	5.88	5.00	5.21	5.03
	SD	1.66	1.92	1.90	1.75	2.01	1.99
Bodily Discomfort	Mean	4.00	6.94	5.87	4.67	5.02	4.77
	SD	1.39	2.21	1.62	1.68	1.87	1.56
Overall	Mean	46.54	83.79	80.99	52.38	51.35	50.99
	SD	10.59	12.84	13.24	11.44	12.19	12.03

As observed, the mean scores in the ACT and pharmacotherapy groups at the posttest stage show a reduction in all subscales compared to the pretest stage. Based on the results in Table 1, it can be inferred that ACT has brought about changes in the quality of life components.

Considering the results of the Shapiro-Wilk test and the significance levels obtained for each research variable, which are greater than 0.05, the null hypothesis is confirmed, indicating that the data for the variables are normally distributed across the three groups. Hence, parametric tests can be used. To examine the impact of ACT group therapy and pharmacotherapy on quality of life, repeated measures ANOVA (one within-subject factor and one between-subject factor) was employed. Quality of life scores in the ACT and pharmacotherapy groups were analyzed at pretest, posttest, and follow-up stages. To examine significant differences between the means of quality of life components across the three stages, assumptions of homogeneity of variances and sphericity were first checked. Levene's test results for homogeneity of variances indicated that the assumption was met for both groups. Mauchly's test of sphericity showed that the homogeneity of covariances for quality of life components was maintained. The results of the repeated measures ANOVA for within-group and between-group factors are presented in Table 3.

Table 2

Mixed ANOVA Results for Quality of Life Component Scores Using Greenhouse-Geisser Criterion

Variable	Factors/Statistic	SS	df	MS	F	Sig	η^2
Mobility-Daily Activities	Within-group	1920.68	1.15	1670.05	97.53	.001	.66
	Test*Group Interaction	6.99	2.30	3.04	1.18	.047	.21
	Between-group	12.97	2	6.49	1.17	.049	.15
Sleep/Fatigue-Emotional Well-being	Within-group	307.15	1.85	165.93	87.71	.001	.63
	Test*Group Interaction	3.59	3.70	0.97	0.51	.043	.33
	Between-group	4.93	2	2.46	1.05	.047	.19
Stigma-Social Support	Within-group	591.44	1.49	395.65	81.65	.001	.62
	Test*Group Interaction	40.44	2.99	13.53	2.79	.046	.39
	Between-group	58.33	2	29.17	1.80	.017	.11
Perceptual Problems/Hallucination-Cognition	Within-group	457.86	1.94	236.29	174.89	.001	.77
	Test*Group Interaction	5.28	3.87	1.36	1.01	.040	.38
	Between-group	7.05	2	3.52	1.14	.046	.13
Communication-Bodily Discomfort	Within-group	150.70	1.68	89.79	111.57	.001	.69
	Test*Group Interaction	3.07	3.36	0.92	1.14	.034	.43
	Between-group	6.33	2	3.17	1.71	.027	.39
Gastrointestinal Problems-Mobility	Within-group	292.31	1.93	151.19	159.09	.001	.76
	Test*Group Interaction	5.32	3.87	1.38	1.45	.022	.54
	Between-group	2.12	2	1.06	1.13	.005	.21
Daily Activities-Emotional Well-being	Within-group	210.01	1.91	110.01	117.41	.001	.70
	Test*Group Interaction	7.43	3.82	1.95	2.08	.043	.55
	Between-group	23.42	2	11.71	1.53	.024	.27
Sexual Function	Within-group	206.16	1.57	131.55	158.33	.001	.76
	Test*Group Interaction	4.77	3.13	1.52	1.83	.014	.44
	Between-group	7.79	2	3.89	1.42	.047	.16

The results in Table 2 show that for the within-group factor, the calculated F-value for the stages (pretest, posttest, and follow-up) is significant at the 0.05 level for the quality of life components ($P<0.05$). Consequently, there are significant differences between the mean scores of the quality of life components across the three stages of pretest, posttest, and follow-up. Additionally, there are no significant differences between the quality of life components at the posttest stage compared to the follow-up stage, indicating no significant changes in the quality of life components from the posttest to the follow-up stage ($P>0.05$).

4. Discussion and Conclusion

Parkinson's disease is a complex neurological disorder that has extensive impacts on patients' quality of life (Poewe et al., 2017). Due to the variety of motor and non-motor symptoms, managing this disease requires multifaceted therapeutic approaches (Jankovic, 2008). This study aimed to compare the effectiveness of Acceptance and Commitment Therapy (ACT) and pharmacotherapy on the quality of life of Parkinson's patients. The results indicate that ACT has a greater impact on improving the quality of life of Parkinson's patients compared to pharmacotherapy. These findings align with previous studies on the effectiveness of ACT in improving the quality of life in patients with chronic diseases (Graham et al., 2016).

One of the main reasons for the superiority of ACT over pharmacotherapy is its comprehensive and multidimensional approach. While pharmacotherapy primarily focuses on reducing motor symptoms (Olanow, Stern, & Sethi, 2009), ACT also addresses the psychological and social aspects of the disease (Hayes, Strosahl, & Wilson, 1999). This approach helps patients move towards a more meaningful and satisfying life by accepting their mental experiences and committing to personal values (Harris, 2009). In other words, ACT can positively impact patients' quality of life by improving their psychological state.

Another strength of ACT is its flexibility and adaptability to the various needs of patients (Hayes et al., 2006). This therapeutic method allows patients to accept unpleasant thoughts and feelings instead of trying to control or avoid them and actively move towards their goals and values. This can lead to improved daily functioning and increased life satisfaction (Graham et al., 2016). On the other hand, pharmacotherapy, despite its positive effects on motor symptoms, may be associated with side effects such as dyskinesia and motor fluctuations, which can affect patients' quality of life (Schapira, 2009).

The results of this study also showed that ACT is more effective in reducing non-motor symptoms of Parkinson's disease, including anxiety and depression. These findings are consistent with previous research on the effectiveness of ACT in reducing psychological symptoms in patients with chronic diseases (Graham et al., 2016). Reducing anxiety and depression can directly improve the quality of life of Parkinson's patients, as these psychological symptoms can negatively impact various aspects of daily life (Chaudhuri, Healy, & Schapira, 2006).

Conversely, pharmacotherapy alone cannot fully improve the quality of life of Parkinson's patients despite its positive effects on motor symptoms. Research has shown that many Parkinson's patients continue to suffer from psychological and social problems despite medication use (Carod-Artal et al., 2013). This highlights the need for complementary and combined therapeutic approaches for better disease management. Therefore, combining pharmacotherapy with psychological methods such as ACT can significantly improve patients' quality of life.

The superiority of ACT over pharmacotherapy in this study demonstrates that psychological methods can play a crucial role in managing chronic diseases. This emphasizes the importance of addressing the psychological and social aspects of Parkinson's disease. Psychological therapies like ACT can help patients better cope with daily challenges and move towards their goals and values (Hayes et al., 2006). This can lead to an overall improvement in the quality of life of Parkinson's patients. Additionally, the results of this study suggest that ACT can be used as a complementary method alongside pharmacotherapy. This combined approach can enhance the quality of life of Parkinson's patients by addressing different aspects of the disease. Pharmacotherapy can help reduce motor symptoms, while ACT can improve the psychological and social state of patients (Olanow et al., 2009; Graham et al., 2016). This combination can provide better and more comprehensive services to Parkinson's patients.

Ultimately, the results of this study can provide useful information to physicians and therapists about the effectiveness and various applications of ACT group therapy and pharmacotherapy in managing Parkinson's disease. This information can help improve therapeutic strategies and provide better services to Parkinson's patients. Based on the results of this study, new and combined therapeutic approaches can be proposed to improve the quality of life of

Parkinson's patients and offer more effective ways to manage this disease.

In summary, this study showed that ACT group therapy, with its comprehensive approach and attention to the psychological dimensions of the disease, has a greater impact on improving the quality of life of Parkinson's patients compared to pharmacotherapy. These findings emphasize the importance of addressing the psychological and social aspects of Parkinson's disease and using multifaceted therapeutic methods. Given the complexity and variety of Parkinson's symptoms, using combined therapeutic approaches can help improve patients' quality of life and provide better and more comprehensive services to them.

This study also had limitations that should be considered in future research. One limitation was the relatively small sample size, which may have influenced the results. Therefore, future studies with larger and more diverse sample sizes are recommended to obtain more generalizable results. Additionally, the study duration might have affected the results. Thus, longer-term studies can help examine the long-term effects of ACT and pharmacotherapy on the quality of life of Parkinson's patients. Finally, this study showed that ACT can be used as an effective and complementary method alongside pharmacotherapy to improve the quality of life of Parkinson's patients. These findings can help develop new therapeutic strategies and improve healthcare services for Parkinson's patients. Based on the results of this study, it is suggested that multifaceted and combined approaches be used to manage Parkinson's disease to help improve patients' quality of life and provide better and more comprehensive services to them.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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