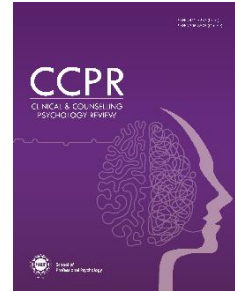


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Cognitive Behavioral Therapy for Anxiety and Quality of Life in Parkinson's Disease Patients

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Abstract

Parkinson's disease (PD), chiefly acknowledged for its motor indications, also contains noteworthy non-motor signs, such as anxiety that can strictly impact the quality of life (QoL) and aggravate the general load of illness. cognitive behavioral therapy (CBT) has appeared as an inspiring management for minimizing psychological signs, predominantly anxiety, among individuals diagnosed with PD. This study aimed to examine the efficiency of CBT for the psychological manifestation in PD. Purposive sampling was used, and sixteen participants (12 men; and 4 women) were randomly assigned to the two treatment conditions (the experimental group receiving therapy and the control group receiving only psycho-education). Therapy comprised ten structured sessions. The age range of participants were between 50 to 69 years ($M=55.81$). The cognitive functioning and specific patients' illness was assessed through Movement Disorder Society - Unified Parkinson's Disease Rating Scale (MDS-UPDRS), The Standardized Mini-Mental State Examination (SMMSE), respectively. The Parkinson's Anxiety Scale (PAS-12) and Parkinson's Disease Questionnaire (PDQ-8) were used to assess anxiety and QoL, respectively. Pre- and post-scores of the treatment showed considerable reduction in scores on the Parkinson's Disease Quality of Life (PDQ-8) scale and Parkinson Anxiety Questionnaire (PAS-8) in the treatment group. To compare the pre- and post-treatment scores of two related groups, the nonparametric test was used. Experimental group showed significant improvement at the post-treatment, indicating alleviation of anxiety and enhancement of QoL in comparison to the psychoeducation group. The study concluded that quality of life improved after adapting healthy routines and modifying dysfunctional thoughts, emotions, and behaviors in PD patients. The findings gave evidence of CBT-based lifestyle adjustment as a psychotherapeutic intervention for PD-related distress and impaired QoL.

Keywords: anxiety, cognitive behavioral therapy, Parkinson's disease

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Introduction

Cognitive behavioral therapy (CBT) has appeared as an encouraging intervention for overcoming psychosomatic signs, predominantly anxiety, in individuals with Parkinson's disease (PD). The PD, chiefly recognized for its motor indications, also contains noteworthy non-motor signs, such as anxiety that can strictly impact the quality of life (QoL) and aggravate the general load of the ailment. This study aimed to discover the effectiveness of CBT in alleviating anxiety amongst PD patients, stressing its likely mode of action and advantages in this distinctive populace (Yazd et al., [2023](#)). PD is a prolonged and persistent neurodegenerative condition. It is regarded as the ongoing decline of dopamine. The reduction of dopamine results in the guaranteed motor indications of PD, comprising tremors, stiffness, bradykinesia (tardiness of movement), and unsteadiness of posture (Lee, [2021](#)). In addition to its motor signs, Parkinson's is connected with an extensive assortment of non-motor indications, comprising intellectual decline, mood-related diseases, that is, anxiety, depression, and sensual defects (Kalbe et al., [2025](#)). These non-motor indicators mostly lead towards motor signs, resulting in a meaningful effect on the life quality of PD people (Reynolds et al., [2020](#)). Its diagnosis is mainly clinical, centered on the physical investigation and history of the patient. Although there is no full treatment for PD, various cures exist to treat signs and mend life quality (Poewe et al., [2017](#)). Furthermore, multi-disciplinary caution concerning physiological, speech, cognitive, and occupational therapy is vital in covering the composite requirements of PD patients. PD advances through many stages ranging from stage 1 of mild signs to stage 5 of severe signs of mostly bed-ridden patients.

Anxiety is a normal human reaction to stressors, categorized by worrisome thoughts, tense feelings, amplified heart rate, and muscular tension. Persistent anxiety that impacts day-to-day activities can be suggestive of an anxiety disorder (American Psychiatric Association [APA], [2013](#)). Anxiety could aggravate motor signs of PD, which further worsens its management (Kassm et al., [2021](#)). Studies direct that the interaction amid the neurodegenerative progressions of PD and the mental stress of handling a chronic disorder result in anxiety in PD patients (Pontone et al., [2022](#)). Moreover, the "on-off" variations in consequence of levodopa, a communal PD medicine, can lead to anxiety and panic

attacks during the "off" condition (Pontone et al., [2022](#)). Management of anxiety in PD needs both pharmacological and non-pharmacological management. The CBT is reflected as a nonmedical cure for decreasing anxiety in PD patients by assisting them to develop coping skills and adjusting maladaptive thinking and behavioral patterns (Reynolds et al., [2020](#)).

QoL is a multidimensional notion comprising social, physiological health, psychosomatic state, independence level, public relations, individual beliefs, and environmental relationships (Morley et al., [2026](#)). PD can severely impact QoL. The incidence of anxiety in PD individuals worsens the disease and has an overall negative impact on QoL (Kassm et al., [2021](#)). Anxiety in PD is linked with augmented caregiver problems and higher healthcare challenges, affecting the prerequisite for inclusive treatment plans (Maggio et al., [2025](#)). CBT is operative in minimizing anxiety signs and refining QoL in PD people through therapeutic means (Reynolds et al., [2020](#)).

The CBT was advanced by Beck in the 60s, intended to encounter dysfunctional thinking and behavioral patterns. Its working principle is that destructive ways of thinking lead towards emotive and behavioral problems, and by altering these thinking patterns, people can recover their emotive and behavioral welfare (Beck, [2011](#)). Application of CBT in PD has a significant impact. Moonen et al. ([2021](#)) modified CBT to tackle the particular requirements of people with PD. Key constituents of this methodology comprise restructuring cognitions to amend misleading thinking patterns related to PD and behavioral issues. Hence, CBT can lead towards better anxiety management in PD, eventually strengthening the patient's mental health and welfare.

Theoretical Background

Neurotransmitter Imbalance Theory

This theory suggests that the severity level of anxiety in PD is related to disturbances in neurotransmitter classifications, predominantly dopamine, norepinephrine, and serotonin. The deterioration of dopaminergic passageways in PD can lead to mood changes and anxiety. Disparities in brain intensify anxiety, frequently noticed in PD patients (Remy et al., [2005](#)).

Cognitive-Behavioral Model

This model proposes that maladaptive cognitive processes and behaviors influence anxiety in PD. Individuals may encounter catastrophic thoughts about their illness advancement, resulting in intensified anxiety. The stress of living with an enduring disease and handling motor and non-motor signs intensifies distorted thinking patterns (Fernie et al., [2015](#)). Furthermore, due to these anxiety-provoking thoughts, PD patients may be involved in avoidance-related behavioral patterns by stepping back from social relations. Evading social circumstances may lessen instant anxiety but exacerbate it. As the cycle of anxiety endures, it affects mental condition and QoL, increasing the difficulties already modeled by the physiological signs of PD (Wang et al., [2025](#)).

Social Isolation and Stress Model

This theory accentuates those physiological disparities and social withdrawal in PD lead towards amplified stress and anxiety (Pontone et al., [2022](#)). Enduring stress may contribute to added social isolation, as people may feel too confused to be involved in social deeds, thus strengthening the cycle of isolation and anxiety. These non-motor indicators also considerably affect QoL (Weintraub et al., [2022](#)). According to Soilemezi et al. ([2025](#)), individuals with PD often go through undue discrimination within workplace and have a shortage of chances to contribute to their societies. This may lead towards anxiety in PD patients. Anxiety in PD results in reduced QoL, and amplification in the burden of the caregiver (Kassm et al., [2021](#)). Moreover, anxiety disorders occur in up to 35% of patients with PD (Mulders et al., [2018](#)). For treating psychotropic signs, people try to orally take psychiatric drugs which, in general, may aggravate and worsen PD symptoms (Hao et al., [2025](#)). Non-pharmacological management, that is, CBT is a promising substitute (Van Wegen et al., [2024](#)). In this study, diagnosed patients of Parkinson's of middle age onset (50-69) years were targeted. This is because as age progresses, pervasiveness of PD escalates along with escalation in cognitive decline (Sarapura-Castro et al., [2026](#)). So, patients in middle age were the potential match for CBT considering the mild stage of the PD before cognitive decline would have expected therapy response. Furthermore, therapeutic effectiveness of CBT was intended to be tested in managing illness-related anxiety and maladaptive patterns. Subsequently, these patients could help themselves in dealing with the

complications of PD and maintaining their mental health and the overall QoL (Yazd et al., [2023](#)).

Objective

The current study aimed to assess the effectiveness of CBT for the psychological manifestation of PD.

Hypotheses

- CBT would be effective in reducing anxiety in patients with PD.
- CBT would be effective in improving the QoL in patients with PD.

Method

Research Design

In the current study, a between-group research design was implemented.

Sample and Sampling Strategy

The purposive sampling was used to recruit the participants from public and private hospitals. The sample consisted of 16 participants. A total of 73 participants (diagnosed patients) were approached through public and private hospitals. After administering the screening scales, 16 participants were recruited as they met all the necessary inclusion criteria based on the screening results. There were two groups. Participants were between 50 and 69 years of age group, (M= 55.81). Participants were randomly assigned to each of the two treatment conditions, by assigning every 2nd participant into the experimental group. In this study, eight participants were part of each experimental and control (psychoeducation) group.

Inclusion Criteria

- Patients with PD with middle-aged onset (50-69) years (Kim et al., [2020](#)).
- Patients with stages 1 and 2 (mild severity level) of PD.
- Patients with PD suffering from anxiety.

Exclusion Criteria

- Patients with PD who have a decline in their cognitive functioning.
- Patients with PD suffering from any other psychiatric and medical

illness.

- Patients with PD ongoing concurrent psychological treatment for the treatment of anxiety.
- Previously received CBT.

Assessment Measures

Demographic Sheet

Demographics consisted of age, gender, marital status, education, family system, and their relationship with the caregiver. Information regarding medical dependency along with any concurrent psychotherapy or prior CBT experience was gathered.

Table 1

Demographic Characteristics of the Sample (N=16)

Variables	CBT Group (n=8)		Control Group (n=8)	
	<i>M (SD)</i>	<i>f (%)</i>	<i>M (SD)</i>	<i>f (%)</i>
Age	54.50(5.45)		57.12(5.93)	
Gender				
Males		4(50)		8(100)
Females		4(50)		
Marital Status				
Single		2(25)		1(12)
Married		5(63)		6(76)
Widowed		1(12)		1(12)
Education	13.25(1.83)		11.12(3.6)	
Family System				
Nuclear		2(24)		
Joint		6(76)		8(100)
Caregiver taking care of patients		8(100)		8(100)
Any other psychological issue		8(100)		8(100)
Any other physical ailment		8(100)		8(100)
Concurrent Psychotherapy		8(100)		8(100)
Prior Experience of CBT		8(100)		8(100)
Duration of Illness	2(2.13)		1.81(0.37)	

Movement Disorder Society - Unified Parkinson's Disease Rating Scale (MDS-UPDRS)

This assessment tool (Goetz, [2004](#)) consists of four sub-scales, with total scores ranging from 0 (no disability) to 260 (complete disability). Part I comprises non-motor experiences of daily living: 13 items. Score range: 0-52, 10 and below is mild, 22 and above is severe. Part II: Motor experiences of daily living: 13 items. Score range: 0-52, 12 and below is mild, 30 and above is severe. Part III involves a motor examination with 18 items. Score range: 0-132, 32 and below is mild, 59 and above is severe. Part IV: Motor complications: 6 items. Score range: 0-24, 4 and below is mild, 13 and above is severe. While, scores between mild and severe level are considered moderate. Each item is rated on a scale of 0 to 4, representing levels from *normal* (0) to *severe* (4). It's Cronbach's alpha ranges from .79 - .93.

The Standardized Mini-Mental State Examination (SMMSE)

This test (Molloy et al., [1991](#)) evaluates various cognitive domains, such as orientation, registration, attention, calculation, recall, language, and the ability to follow simple commands. The score ranges between 0 to 30 indicating functioning as the following: Normal cognition (26-30); mild impairment (20-25); moderate impairment (10-19), and severe impairment (0-9). Cronbach's alpha value of this measure ranges from .80 to .90.

The Parkinson's Anxiety Scale (PAS -12)

The PAS (Leentjens et al., [2014](#)) is a 12-item observer or patient-rated scale with three subscales, that is, persistent, episodic anxiety, and avoidance behavior. It consists of a 5-point Likert scale from 0 (*never*) to 4 (*always*) with scores ranging from 0 (no anxiety) to 48 (higher anxiety). The severity of anxiety symptoms can be classified according to the following score ranges: 8-15 (mild anxiety), 16-24 (moderate anxiety), and above 24 indicate severe anxiety. Its Cronbach's alpha value ranges from .80 to .90.

The Parkinson's Disease Questionnaire (PDQ-8)

This questionnaire was used to assess health-related QoL in the study (Jenkinson et al., [1999](#)). Participants filled 8 items that covered various aspects of daily living and well-being affected by PD. Items were rated on

Likert scale ranging from 0 (*never*) to 4 (*always*) with total score range from 0 (better QoL) to 32 (poorer QoL). Its Cronbach's alpha value ranges from .70 to .90.

Session Rating Scale (SRS)

At the end of the therapy, SRS was administered to take participant's feedback of therapy. It contains four domains; therapist's approach, quality of therapeutic relationship, setting goals, and their overall understanding of therapy (Duncan et al., [2003](#)). The total scores on all the forms were above the cut-off value of thirty-four.

Therapist Competence and Treatment Adherence

This scale (Young & Beck., [1980](#)) was administered to rate therapist competence and adherence to treatment at the end of therapy. Two field experts provided their observations on the application of therapeutic techniques, assignment of homework, setting agenda, getting feedback, and therapist's own understanding.

Interventions

Therapy Protocol for CBT

Moonen et al. ([2021](#)) therapy protocol was used. According to this manual, participants were given PD overview, its symptoms, progression, effect on daily life, and exploration of anxiety manifestation. They were also psycho-educated. Experimental group was introduced to CBT principles and techniques according to the specific prerequisites of PD.

Table 2

Session-wise Therapy Protocol for CBT

Session	CBT Therapy Goal (Moonen et al., 2021)	Homework Tasks
1	Introduction and psycho-education about anxiety	To review the handout about anxiety psycho-education
2	Introducing and practicing anxiety monitoring	To practice anxiety monitoring once per day
3	Introduction to self-management, recording personal habits, and sleep routines	To practice anxiety monitoring once per day, review personal habits, and

Session	CBT Therapy Goal (Moonen et al., 2021)	Homework Tasks
4	Introducing and practicing anxiety management: deep breathing (DB) and mindful awareness	use the sleep diary To practice DB and mindful awareness, and continue practicing anxiety monitoring once per day
5	Introducing and practicing changing thoughts (REACT)	To practice REACT skill, and continue practicing anxiety monitoring once per day, and DB and mindful awareness
6	Introducing and practicing anxiety management: Progressive Muscle Relaxation (PMR) and Imagery	To practice PMR and Imagery, and continue practicing anxiety monitoring once per day, DB and mindful awareness, and REACT technique
7	Introducing and practicing problem-solving (SOLVED)	To practice SOLVED, and continue practicing anxiety monitoring once per day, DB and mindful awareness, REACT technique, PMR and Imagery
8	Introducing and practicing changing anxiety behavior	To practice previous techniques and recording of relaxation or coping skill(s) they used during exposure
9	Reviewing and practicing all the previous skills and techniques	To continue with practicing anxiety monitoring, relaxation techniques, and each of the coping skills (that is, REACT, SOLVED, changing anxiety behavior)
10	Reviewing self-management plan and discussing maintenance of treatment gains	Termination of the therapy program

Therapy Protocol for Psychoeducation

Control group was individually psycho-educated about anxiety symptoms by following the session 1 guidelines of Moonen et al. (2021).

Procedure

Firstly, the research proposal was accepted by the Departmental Doctoral Program Committee (DDPC) from the Centre for Clinical Psychology at the University of the Punjab. Then, consent was taken from the respective authors to use and translate the tools. Next step was data collection. A total of $N=73$ participants were approached through public and private hospitals, already diagnosed patients of PD. A total of 16 participants fulfilled the inclusion criteria. Participants filled out the informed consent form and assigned to two treatment conditions, that is, CBT and psychoeducation, eight participants each. Experimental group received ten CBT-based individual sessions every week. Psychoeducation group was individually psycho-educated about anxiety symptoms. Session ranged from 60-70 minutes. In the pre-treatment level, assessment was carried out and used as a baseline for the treatment. In the post-treatment level, scores of both groups were individually noted and compared with pre-treatment scores. All assessment measures were administered on pre- and post-levels of treatment for evaluating the efficacy of each treatment condition.

Ethical Considerations

Ethical considerations were carefully addressed. Participants received clear information about the study's purpose, how the results would be used, and their right to withdraw at any time. Their confidentiality was ensured. Psycho-education group was offered CBT sessions later.

Results

Data analysis was done using SPSS, V23. Mann Whitney U test was employed to compare differences between two groups at pre- and post-treatment level separately. Wilcoxon Sign Rank test was applied to compare the median differences of two conditions. Statistical analysis was guided by the sample size and data characteristics of the study. Due to small sample size ($n = 8$) per group, parametric assumptions, such as normality and homogeneity of variance were vulnerable to violation. Therefore, non-parametric tests were preferred.

Pre-treatment Differences

Table 3

Mann Whitney U test on Pre-intervention Total Scores of PDQ-8, PAS-8, and its Subscales of Persistent PAS, Episodic PAS, and Avoidance PAS

Scales	Experimental (n=8)		Control (n=8)		U	p
	Mr	Md	Mr	Md		
Total PDQ-8	8.75	22.00	8.25	22.00	30.00	0.08
Total PAS	6.00	31.50	11.00	33.50	12.00	0.07
Persistent PAS	7.06	13.50	9.94	15.00	20.50	0.19
Episodic PAS	7.63	11.00	9.38	11.50	25.00	0.45
Avoidance PAS	5.88	7.00	11.13	8.00	11.00	0.21

Note. PDQ-8=Parkinson's Disease Quality of Life, PAS= Parkinson's Anxiety Scale, Mr=Mean Rank.

The Mann-Whitney U scores of the two groups indicated no significant difference in the pretreatment levels, highlighting that both groups had similar scores before provision of intervention. The PDQ-8 and PAS and its subscales of persistent, episodic, and avoidance showed almost the same results of both groups before administering therapy.

Post-treatment Differences

Table 4

Mann Whitney U test on Post- intervention Total Scores of PDQ-8, PAS-8, and its Subscales of Persistent PAS, Episodic PAS, and Avoidance PAS

Scales	CBT		Control		U	p
	Mr	Md	Mr	Md		
Total PDQ-8	4.50	9.00	12.50	20.50	0.00	0.001
Total PAS	4.50	8.00	12.50	28.00	0.00	0.001
Persistent PAS	4.50	3.00	12.50	11.50	0.00	0.001
Episodic PAS	4.63	3.00	12.38	9.00	1.00	0.001
Avoidance PAS	4.88	2.50	12.13	7.00	3.00	0.002

Note. PDQ-8=Parkinson's Disease Quality of Life, PAS= Parkinson's Anxiety Scale, Mr=Mean Rank.

The Mann-Whitney U test results depicted statistically significant

differences on the post-treatment scores of all assessment measures between both groups. Overall findings highlighted the beneficial effect of CBT in reducing persistent, episodic, and avoidance specific anxiety symptoms. Similarly, improvement in impaired quality of life was found evident in CBT reviving group.

To compare the therapeutic change across the timeline (pre- to post-treatment scores), both groups were assessed while employing Wilcoxon Signed Rank test.

Table 5

Wilcoxon Signed Rank Test for pre- to Post-treatment Differences for CBT and Psychoeducation Group on Total Scores of PDQ-8, PAS-8, and its Subscales

Scales	CBT Group (n=8)				Control Group (n=8)			
	Pre	Post	z	p	Pre	Post-	z	p
	M(SD)	M(SD)			M(SD)	M(SD)		
Total PDQ-8	22.00 (2.00)	9.75 (1.98)	-2.53	0.01	21.75 (2.05)	20.50 (1.51)	-2.51	0.01
Total PAS	31.50 (3.25)	8.75 (2.81)	-2.52	0.01	34.75 (2.18)	26.25 (4.46)	-2.52	0.01
Persistent PAS	13.75 (1.48)	3.25 (0.70)	-2.52	0.01	14.62 (0.74)	11.37 (1.76)	-2.53	0.01
Episodic PAS	10.62 (2.44)	3.12 (1.35)	-2.52	0.01	11.62 (1.40)	8.62 (1.68)	-2.45	0.01
Avoidance PAS	7.12 (1.12)	2.37 (1.50)	-2.55	0.01	8.50 (1.08)	6.25 (1.58)	-2.55	0.01

Note. PDQ-8=Parkinson's Disease Quality of Life, PAS= Parkinson's Anxiety Scale.

The hypothesis, that experimental group scores would change significantly after the treatment, was accepted. The Wilcoxon Signed Rank test showed significant score differences at post-treatment level on QoL as well as anxiety symptoms, suggesting a definite therapy effect.

For the psychoeducation group, reduction was also found in impaired QoL and anxiety symptoms.

Participants' Feedback of Therapy

Duncan et al. (2003)'s session rating scale was administered at the end of the therapy. for measuring participant's feedback. The total scores on all the forms were above the cut-off value of thirty-four. The following

table illustrates the mean scores for each domain, rated out of ten.

Table 6

Participants' Feedback about the Therapy (N=8)

Items	<i>M</i>	<i>SD</i>
Relationships	8.62	1.08
Goals and Topics	8.87	0.68
Approach or Method	9.37	0.99
Overall	8.37	8.43

The results of the rating indicated that participants expressed their satisfaction with provided CBT therapy intervention.

Therapist Competence and Treatment Adherence

Young and Beck's (1980) scale was used, for this purpose, two senior and experienced clinical psychologists were consulted to get their rating as mentioned in the table.

Table 7

Rating by Experts on Treatment Adherence and Competence

Items	<i>M</i>	<i>SD</i>
Agenda	4.00	.00
Feedback	5.00	1.41
Understanding	5.00	1.41
Interpersonal effectiveness	5.00	1.41
Collaboration	5.00	1.41
Pacing and efficient use of time	4.00	.00
Guided discovery	4.00	.00
Focusing on key cognitions or behaviors	5.00	1.41
Strategy for change	5.00	1.41
Application of cognitive behavior techniques	5.00	1.41
Homework	4.00	.00

Results highlighted that the therapist obtained mean scores of 4 (good) and 5 (very good) overall in all the domains, indicating an overall satisfactory level of performance.

Discussion

The PD has its debilitating effect on both physical and mental health of

individuals suffering from it. This is because the disease is chronic, irreversible, and progressive as well as brings forth repercussions on a patient's physical and emotional health. Considering the psychological need of psychotherapy, this study intended to assess the clinical application of CBT for the neurological condition of Parkinson's.

The results demonstrated a substantial difference in pre- and post-assessment of anxiety and QoL in response to CBT in managing PD, which suggested that CBT can be helpful for treating anxiety and improving QoL in PD patients. It is now acknowledged that individuals who endure physical health difficulties are two to three times more likely to encounter mental health conditions compared to the general populace (Gibson et al., [2023](#)). This comorbidity is connected with increased use of physical health services, poorer health outcomes, and reduced life quality (Seritan et al., [2023](#)). Hence, mental health services have improved the well-being of these patients. This study highlighted that CBT may have a beneficial impact on these patients.

Results indicated a decline in the anxiety level of PD patients after therapy. This finding was in line with a case study by Apostol et al. ([2023](#)), highlighting that CBT might have a beneficial effect on PD-related non-motor symptoms, such as speech and sleep issues. In conclusion, during CBT sessions, anxiety symptoms of PD patients diminished, emphasizing its importance in managing anxiety in PD.

Persistent anxiety, which is an enduring pattern of anxiety, also reduced in PD patients after CBT. In a qualitative study, a theme of anxiety as an enduring pattern emerged among these patients (Blundell et al., [2023](#)). Seritan et al. ([2023](#)) highlighted that this can be reduced by therapy. According to Moonen et al. ([2021](#)), episodic anxiety and patients' avoidance behavior due to PD can be reduced after therapy. This study showed that there was a significant decline in participants' episodic and avoidance anxiety after CBT.

After treatment, a statistically significant difference was found among PD patients, highlighting improvement in the QoL of these patients after therapy. Zhu et al. ([2021](#)) supported these results by suggesting that therapy can improve the overall health-related QoL of PD patients.

In PD, deteriorating QoL can encompass declines in physical functioning and social interactions by exacerbating feelings of being

evaluated in the presence of others, resulting in isolation. Biological changes in the brain due to illness, coupled with psychological stress and social withdrawal, create a feedback loop that worsens both life quality and psychosomatic health (Pontone et al., [2022](#)). This study also highlighted that with high levels of anxiety, their quality of level was also affected.

After following CBT modalities, patients reported improvement in their QoL, social interaction, and improved independent level of functioning. According to Interian et al. ([2022](#)), patients reported an increase in their life quality by showing more public interaction after receiving CBT. This study also showed consistency with the present findings.

Patients' view of illness in a threatening manner may often lead towards anxiety. Furthermore, it may also result in avoidance, such as withdrawing from social activities. These results are consistent with previous studies showing that older patients having negative beliefs about their illness were more likely to engage in avoidance behaviors. This withdrawal was associated with a higher level of anxiety during the initial stage of the illness (Gibson et al., [2023](#))

Jellinger ([2024](#)) found that patients with longer disease duration often report lower levels of anxiety, due to the development of coping strategies over time. In this study, patients were in stages 1 and 2 with a mean duration of illness of about 1.81 years. They had a fear of evaluation by others due to their tremors, which might be the cause of more persistent anxiety in them. The results evidently showed that participants of the treatment group constantly observed the anxiety monitoring chart and followed the indications.

Conclusion

The present study concluded CBT as an efficacious therapeutic intervention that enhances engagement in healthy daily habits and self-monitoring, effectively addressing distressing thoughts, emotions, and behavioral difficulties in PD patients. It resulted in significant improvements in both psychological health and physical activity levels among patients. Overall findings supported CBT as a practical psychotherapeutic intervention for PD in improving their anxiety and QoL.

Limitations and Suggestions

- This study consisted of a smaller sample size, due to highly rigorous and specific inclusion criteria established to ensure sample homogeneity. This might limit generalization. However, these parameters were essential to eliminate confounding variables and maintain high internal validity. So, follow-up studies with larger and more diverse samples can be conducted that might help validate the findings.
- This study focused on PD patients who were experiencing anxiety without depression. Research suggests that anxiety is more common than depression in the early stages of PD (Stages 1 and 2). As the disease progresses, depression tends to become more prevalent. In this study, PD patients dealing with anxiety only were specially selected due to their initial stage. Future studies could investigate cases where patients experience both anxiety and depression, whether as co-occurring conditions or as separate diagnoses.
- The control group continued using anxiety medication and were not given a placebo, consequently the control group also showed improvement, which may have affected the study's findings. In future studies, it is recommended to explore culturally-sensitive ways to introduce placebo treatments, ensuring a more accurate comparison between groups.

Implications

- The study suggested that CBT could be a useful addition to neurological care, especially for addressing psychological challenges, such as anxiety in PD. This approach emphasizes the importance of considering both psychological and neurological health in treatment. This could lead towards better overall outcomes and improved QoL for these patients.
- This study is particularly important for the caregivers of these patients, as it sheds light on effective strategies for treating the psychological challenges of these patients. By incorporating CBT into the care plan, the study offered caregivers a valuable understanding of how they can support their loved ones more efficiently.

Author Contribution

Nimra Ghaffar: conceptualization, methodology, data curation, formal analysis, investigation, writing – original draft. **Humaira Naz:** conceptualization, methodology, supervision, resources, validation, writing – review & editing.

Conflict of Interest

The authors of the manuscript have no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

Data Availability Statement

The data associated with this study will be provided by the corresponding author upon request.

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Generative AI Disclosure Statement

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