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Research Article

Effect of Awareness Program on Stress and Anxiety among Parkinson's Disease Patients

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ABSTRACT

Background: Parkinson's disease is a common degenerative neurological illness that reduces life expectancy and causes loss of independence. **Aim: To** evaluate the effect of awareness program on stress and anxiety among Parkinson's disease patients**. Study design:** A quasi-experimental research design was usedto fulfill this study using a pre-test and post-test one-group design. **Setting:** The study was conducted in the neurology outpatient setting at Sohag University Hospital. **Subjects**: the study included a convenient sampling technique of 100 patients with Parkinson's disease. **Tools of data collection:**Three tools were used for data collection; **Tool (I): Structured interview questionnaire:** This tool was made up of the following three parts: **Part 1:Personal data** of the studied patients: It contained information on the age, gender, education level, and place of residence of the patients, **Part 2:** Structured multiple-choice questionnaire (pre and post) to assess the patients' knowledge regarding Parkinson's disease, and **Part (3):** Patients' practice questionnaire (pre and post), **Tool II:** Perceived Stress Scale-10 (PSS-10), and **Tool III:**The State-Trait Anxiety Inventory. **Results:**There was a statistically significant difference in the total score of the knowledge and practices after the awareness program application among Parkinson's disease patients. Astatisticallysignificant difference and reduction were found between stress mean scores and anxiety at (P=0.001) pre and post-awareness program application. **Conclusion:** Theawareness program application has a significant improvement in knowledge and practice with a reduction in mean post-test stress and anxiety among Parkinson's disease patients. **Recommendations:** It is stronglyadvised to apply continuous training for Parkinson's disease patients about the importance of the awareness program application regarding stress and anxiety management strategies to be able to use them as a part of routine care.

Keywords: **Anxiety,** Awareness program, **Parkinson's disease Patients, Stress.**

Introduction:

Parkinson's disease is a common neurodegenerative disorder characterized by four hallmark signs: diminished postural reflexes, stiffness, bradykinesis, and resting tremor. Parkinson's disease is thought to have been diagnosed in at least 4 million persons globally. Even though the precise cause of the condition is unknown, Parkinson's disease is more common in older persons, especially those over 50 (**Moonen, 2021).**

Patients with Parkinson's disease are said to often walk with a slow, shuffling, and dysrhythmic gait. Eventually, balance issues also affect the majority of persons with Parkinson's disease. Even with advancements in medical therapy, gait instability, and balance impairments emerge as the disease worsens and contribute to falls, lower quality of life, and loss of independence. The medical community, the financial system, and society as a whole are thereby increasingly burdened by individuals with Parkinson's disease (**Carey, 2021).**

Parkinson's disease patients struggle to manage social expectations, an increasingly fast-paced lifestyle, and physical limitations or other health issues brought on by the loss of physiological capabilities (**Pontone & Mills, 2021**). In addition, mental health problems are more likely to surface in this situation. According to data from the World Health Organization from 2017, the prevalence of anxiety disorders and depression, respectively, is 3.8% and 7% of all people aged 60 and above. These ailments are now one of the main causes of disability in the world (**Moonen, 2021).**

Anxiety and stress are two psychological conditions that are increasingly widespread. However, current global treatment standards are far from ideal. The complex mechanisms underlying these illnesses limit many of these people to taking medication and cognitive behavioral therapy. However, pharmacological treatment has disadvantages and unfavorable side effects, even as cognitive behavioral therapy requires in-person treatment, which is problematic for many patients. For those who have Parkinson's disease, who are a fragile population with even less hopeful treatment prospects, this is particularly challenging. Cognitive behavioral therapy and medication treatment add significantly to the cost of mental health care, placing a significant financial strain on patients and their families. Therefore, the importance of choosing reasonably priced and non-toxic physical exercise becomes particularly prominent (**Zhang et al., 2020).**

Parkinson's disease is a neurological condition that degenerates with time and can cause physical and psychological issues for both the person with the diagnosis and the caregiver. Parkinson's sufferers experience anxiety and other emotional issues more frequently than those in the general population, but it is unknown how much of this anxiety is caused by the illness itself, a reaction to it, side effects from medicine, or other factors unrelated to Parkinson's disease. It is unclear how PWPs experience anxiety, and there aren't many therapeutic trials that have conclusively demonstrated the effectiveness of psychological or pharmaceutical therapies (**Pontone and Mills, 2021).**

Parkinson's disease-specific symptoms, such as increased freezing of gait, as well as symptoms that are similar to one another but might be confused with one another, such as tremors, fatigue, and appetite loss, make identification difficult. The introduction of screening methods specific to illnesses has led to a rise in detection; nevertheless, accurate categorization is still challenging because the criteria have not been proven to work in people with Parkinson's disease. The existence of a subsyndromal kind of anxiety specific to the illness is unknown **(Zhang, 2022**).

The cause of anxiety is unknown in people with Parkinson's disease. According to the standard dopaminergic model of Parkinson's disease patients, emotional processing may be impacted by underlying dopaminergic dysfunction and neuroanatomical alterations. Retrospective data connecting anxiety with the progression of the disease and stopping dopaminergic therapy supports post-mortem studies that show the amygdala, a critical brain region for fear responses that receive mesolimbic dopaminergic input, is degenerating. However, the way that motor deficits diminish anxiety is different from how dopaminergic medications accomplish so. Furthermore, historical data indicates that anxiety may manifest up to 20 years before motor symptoms, and prospective research suggests that anxiety is more common in patients who did not take medication at the time of diagnosis than in controls. Parkinson's disease patients' neuropathology is now believed to influence the fear circuit in a variety of ways, and anxiety may be correlated with significant alterations in network connectivity that indicate cognitive abnormalities before the development of symptoms (**Carey, 2021).**

The brainstem regions rich in noradrenaline (locus ceruleus) and serotonin (raphe nucleus) may be responsible for two potential pathways for the pathophysiological changes that arise early in stress responses.

Studies reveal a connection between anxiety in Parkinson's disease patients and biological sex as well as a family history of anxiety. Genes and gonadal hormones could be the cause of these correlations. It is expected that patients with Parkinson's disease and other neurodegenerative disease pathologies, including several neurotransmitters, will combine intricately to form the neural substrate of anxiety (**De Micco, 2021).**

Anxiety is likely influenced by psychosocial factors in Parkinson's disease patients. In populations without Parkinson's disease, loneliness, neuroticism, and stressful life events are substantial risk factors for anxiety. A recent comprehensive study found that personality, coping techniques, social support, and illness were psychosocial drivers of anxiety in people with Parkinson's disease. Avoidant and pessimistic personality types were associated with higher levels of anxiety, perhaps as a result of less successful coping techniques such as avoiding unpleasant emotional events, while social support and a strong sense of self were found to be protective.

These results suggest a relationship between psychosocial coping techniques for managing chronic illness and mental health. Additionally, people may be less sensitive to diagnosed anxiety disorders because they are more likely to normalize fear or to have additional sources of anxiety, such as issues with family, money, or health. According to **Zimmermann et al. (2021**), there is a possibility that the emergence of anxiety in individuals suffering from Parkinson's disease is complex and influenced by the individual's perception of anxiety.

Those who have Parkinson's disease frequently observe that stress makes their symptoms worse. Everyone experiences stress, or emotional strain brought on by challenging situations; examples of such conditions include conflict with family members or employers. Thus, stress is an outcome of an external circumstance (**American Parkinson's Association,2023)**. In addition to the stress of daily living, anxiety is a common side effect of Parkinson's disease that is brought on by chemical imbalances in the brain. One of Parkinson's disease's most prevalent non-motor symptoms is anxiety, which is frequently accompanied by depression. As dopamine levels change across the day, anxiety does too, with OFF periods being the most intense times for anxiety. When all external sources of stress have been eliminated, anxiety may still exist since it is driven by internal factors (**Carey, 2021)**.

All the symptoms of Parkinson's disease, such as stiffness, slowness, and balance issues, can get worse, but tremor in particular tends to get worse when a person is afraid or stressed. Medication may have a diminished effect on symptoms, especially tremors (**American Parkinson's Association,2023).**

Significantofthestudy:

Because stress and anxiety can sometimes appear in similar ways, it can be challenging for someone with Parkinson's disease to distinguish between the two. In addition to physical symptoms like a fast heartbeat, difficulty breathing, sweating, and headaches, stress and anxiety can also result in excessive concern, restless nights, and inattention.

It is not unusual for anxiety and restlessness to be brought on by the strains of everyday living feeling overburdened, ill-prepared, and overstimulated. These mental health problems may hurt your well-being and even worsen Parkinson's disease symptoms. For this reason, it's critical to identify potential sources of stress and develop coping mechanisms for circumstances that make people anxious. Restoring calm can be facilitated by deep breathing, yoga, tai chi, or meditation. Whether you are a caregiver for someone with Parkinson's disease or have Parkinson's yourself, achieving balance can help you manage life's daily stresses. Using alternative therapies or reducing your exposure to environmental stressors may be necessary to achieve this. These methods are excellent strategies to improve your general health, lower blood pressure, and reduce anxiety. Parkinson's disease patients' symptoms of stress and anxiety have significantly improved as a result of these procedures (**American Parkinson's Association,2023)**.

Aim of the study:

The current study aimed to evaluate the effect of awareness program on stress and anxiety among Parkinson's disease patients**.**

Research hypothesis:

H1: Parkinson's diseasepatients' knowledge levels who received the awareness program are expected to improve post-application than pre-application.

H2: Parkinson's diseasepatients' practice levels who received the awareness program are expected to improve post-application rather than pre-application.

H3: Parkinson's diseasepatients who received the awareness program will experience lower mean scores of stress post-application than pre-application.
H4: Parkinson's diseasepatients who received the awareness program will experience lower mean scores of anxiety post-application than pre-application.

SubjectsandMethod:
Researchdesign:
A quasi-experimental research design was usedto fulfill this study using a pre-test and post-test one-group design.

Setting:
The study was applied in the Neurologyoutpatient at Sohag University Hospital**.**

Sample:
The study included a convenient sampling technique of 100 patients with Parkinson's disease**.**

Tools of data collection:

Tool (I): Structured interview questionnaire:
After examining relevant national and international literature **(American Parkinson's Association,2023, Moonen,2021, Zang,2020)**, the researchers developed it. This tool was made up of the following three parts:
Part 1:Personal data of the studied patients: It contained information on the age, gender, education level, and place of residence of the patients.
Part 2:Structured multiple-choice questionnaire (pre and post) to assess the patient's knowledge regarding Parkinson's disease. First, it covered the definition, etiology, Risk factors, signs and symptoms, and complications of Parkinson's disease, diagnosis of Parkinson's disease, Management and treatment, and prevention of Parkinson's disease.
Scoringssystem
Every right response was valued at one, whereas every wrong response was valued at (zero). Three categories were used to classify the patients' knowledge level: poor (less than 50%), fair (between 50 and 75%), and good (more than 75%).
Part (3):Patients' practice questionnaire (pre and post) to assess the patients' practices about anxiety and stress management exercises post Parkinson's disease. It wasdevelopedbytheresearchers after reviewing current national andinternational literature. It included knowledgeabout exercises to lessen the symptoms of Parkinson's disease. That is why it is important to assess what may be causing stress and learn how to deal with the situations that give rise to anxiety. Meditation, yoga, and deep breathing can help restore a sense of calm.

Scoring system:
The scoring scheme for the practice was as follows: (2) for correctly done, (1) for incompletely finished, and (0) for not completed. Two categories were created from the total practices: good and unsatisfactory. Practice was deemed satisfactory if the patient's score was greater than 60% and considered unsatisfactory if it was less than 60%.

Tool (II):Perceived Stress Scale-10 (PSS-10):
The tool known as the Perceived Stress Scale-10 (PSS10) was adapted from **Cohen et al. (1983**). It is a ten-item self-report measure designed to assess an individual's degree of stress. The nurses are asked to rank their thoughts and feelings from the previous month. The nurses graded each item on a five-point scale that went from never (0) to very often (4). Consequently, the scores of each patient varied from 0 to 40. Higher reported stress levels were reflected by higher scores.
Scoring system:
Low levels of stress were indicated by PSS-10 scores between 0 and 13, moderate levels by scores between 14 and 26, and severe levels by scores of 27 or higher. Items 4, 5, 7, and 8 were the four that used reverse scoring. The PSS was correlated with measures of anxiety, sadness, helplessness, and disease activity to achieve convergent validity. There was 0.78 internal consistency on the scale.
Tool (III): The State-Trait Anxiety Inventory:

The State-Trait Anxiety Inventory is a 40-item self-assessment questionnaire made up of brief statements that were designed by **Spielberger in 1972** to determine the trait and state anxiety level. The scale

has 20 items for assessing trait anxiety and 20 for state anxiety. **State anxiety items** involve: “I am tense; I am worried” and “I feel calm; I feel secure.” **Trait anxiety items** involve: "I worry too much over something that doesn't matter" and "I am content; I am a steady person." All items are rated on a 4-point scale.

Scoring system:

The scale items measure the level of State-Trait Anxiety and are scored as follows: “none” (1), “some” (2), “many” (3), and “entirely” (4). The highest score obtained is 80 and the lowest score is 20. Low scores indicate a mild form of anxiety and high scores indicate a severe form of anxiety.

Tools validity and reliability

The content validity of the tools, their clarity, comprehensiveness, appropriateness, and relevance were reviewed by five experts; three professors in Medical- surgical nursing field and two professors; in the Psychiatric nursing field who reviewed the instruments for clarity, relevance, comprehensiveness, understanding, applicability, and easiness. No modifications were made according to the panel judgment to ensure sentence clarity and content appropriateness. In establishing the reliability and statistically done Alpha Cronbach's way to check the stability of the internal consistency of instrument I was 0.945, and instrument II was 0.923. State-Trait Anxiety Inventory reliability is considered good with Cronbach's alpha of 0.87 for the total score

Pilot study

After developing the tools, a pilot study was conducted on 10% (10 Parkinson's disease patients) of cases to test the feasibility and applicability of the tools used in the current study for data collection as well as to determine the time required to be applied and no modifications were done of the questionnaire and the patients with Parkinson's disease who were tested in the pilot study were included in the study sample.

Ethical considerations:

The faculty dean and research ethics committee of the faculty of nursing provided written initial approval. To acquire their agreement and to explain the goal of the study, the researchers visited with the medical and nursing directors of the chosen settings. Parkinson's disease patients were informed of the study's purpose and allowed to provide verbal consent before being allowed to participate. Parkinson's disease patients were told by the researchers that the study was optional, they could choose not to join, and they could leave the study at any moment, for any reason. They also received assurances of the confidentiality of their information.

Fieldwork:

Three days a week, from 9 am to 12 pm, the researchers have visited the previously chosen sites. They introduced themselves to Parkinson's diseasepatients and explained the purpose of the study. From the start of November 2023 to the end of April 2024, a period of six months was used to gather data. Every interview tool took between thirty to forty minutes to complete.

Implementation of the study included four phases (assessment phase, planning phase, implementation phase, and evaluation phase).

Assessment phase:

- The researcher initially established a friendly relationship with the patients by having brief talks with them. Every patient was interviewed before the program was conducted to gather the patients' data utilizing tool (I) part (1).
- Tool (I) part (2), Tool II and Tool III were used to evaluate the patients' knowledge, practice, stress, and anxiety assessment scales.

II. Planning phase:

In response to the patients' practical demands, knowledge gaps, stress, and anxiety among Parkinson's disease patients, the goals, priorities, and expected results were defined based on the results of the preceding phase. For the patients under study, the researchers designed five sessions—two theoretical and three practical.

The awareness program

They created and updated an awareness program. It featured presentations on Parkinson's disease, both theoretical and clinical.

The general objective of awareness program sessions:

At the end of the **awareness program** sessions, the Parkinson’s disease patients were expected to acquire knowledge and practices that improve and lessen their stress and anxiety.

Specific objectives of the awareness program:

- Define Parkinson’s disease.

- Identify the causes of Parkinson's disease.
- Enumerate the risk factors of Parkinson's disease.
- List the signs & symptoms of Parkinson's disease
- Identify the complications of Parkinson's disease.
- Know the diagnosis of Parkinson's disease.
- Discuss the management and treatment of Parkinson's disease
- Know the prevention of Parkinson's disease.
- Discuss preparation fordoing the exercises.
- List types of exercises that canbeused to manage the stress and anxiety associated with Parkinson's disease.

III. Implementationphase:

After assessing the level of knowledge, practice, stress, and anxiety among Parkinson's disease patients**,** the investigator conducted the pretest by using knowledge and practice assessment tools, the Perceived Stress scale to assess the level of stress, and the State-Trait Anxiety Inventory to assess the level of anxiety. Non-probability convenience sampling technique was used to select the samples. The investigator obtained oral consent from the selected samples before the study and their data were also collected. After the pretest, the stress and anxiety management exercises were performed on the studied sample. The investigator gathered them and taught them about this exercise.

This study aimed to evaluate the effect of awareness program on stress and anxiety among Parkinson's disease patients.

The implementation of the awareness program was aimed at improving patients ' knowledge and practice, stress and anxiety among Parkinson's disease patients through five sessions; including two theoretical and three practical sessions for about 30-45 minutes each).

- The researchers began every session by gathering input regarding the preceding one, and they concluded each one with a recap.
- .From 9 a.m. to 12 p.m., three days a week, the researchers were accessible in the study settings. The previously indicated study techniques were used for one-on-one interviews with each patient.
- .Following a review of the relevant literature based on an assessment of the actual needs of the patients under study, a simplified booklet was used as supportive material and provided to patients in Arabic. It covered all items regarding the knowledge and practice of Parkinson's disease.
- A variety of instructional techniques, including lectures, brainstorming sessions, small-group discussions, visuals, demonstrations, and re-demonstration in the education setting. A variety of instructional tools were employed, including flipcharts, PowerPoint, figures, handouts, and animated films explaining Parkinson's disease and stress and anxiety management techniques.

The awareness program**'s theoretical and practical sessions were done as follows:**

The first session (theoretical) began with the researchers introducing themselves, wishing the patients happy participation in the study, and outlining the goals of the awareness program.

The following topics were reviewed in the first session: definition, causes, risk factors, signs and symptoms, and complications related to Parkinson's disease.

The topics discussed in the second (theoretical) session included the diagnosis, prevention, and treatment of Parkinson's disease.

Third session (Practical): this course covered the administration, therapy, and avoidance of problems associated with Parkinson's disease.

In the fourth session, which was practical, patients were clinically demonstrated and re-demonstrated how to prepare for performing exercises to manage stress and anxiety associated with Parkinson's disease. These exercises were created by the researcher in response to the patient's lack of knowledge and practices.

Fifth Session (Practical): These sessions began with gathering data regarding the preceding sessions and addressing any queries regarding Parkinson's disease, exercise types and frequencies, and safety measures to reduce stress and anxiety. After giving out the post-test to each participant's patients, the researcher expressed gratitude for their participation in the study.

Self-care and lifestyle modifications

To manage anxiety, though, not everyone with Parkinson's disease needs medication; this is a choice that should be discussed with a doctor. A person with Parkinson's disease may benefit from a variety of lifestyle adjustments to better manage stress.

These Parkinson's disease self-care techniques include:

- Making a schedule and allowing adequate time for yourself to complete your duties
  The following are some strategies to help you relax:
- play music
- concentrate on keeping a cheerful outlook and a sense of humor
- interact with upbeat people; join a support group
- work out
- practice meditation

Exercise can reduce stress and anxiety.

Numerous Parkinson's disease non-motor symptoms, such as stress and anxiety, have been demonstrated to improve with exercise. It's interesting to note that a recent study on Parkinson's disease and exercise, stress, and the journal Movement Disorders examined this connection. The results of the study demonstrated that high-intensity endurance exercise lowered morning cortisol levels in Parkinson's disease patients. Exercise provides numerous other advantages for Parkinson's disease patients in addition to reducing stress and anxiety.

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1-Yoga or Tai Chi,

Tai Chi is a form of moving meditation centered on the circulation of "chi," the life force that the ancient Chinese thought was stopped when illness existed. It is made up of motions that flow continuously. Yoga is a form of exercise that has its roots in ancient India. Its goal is to unite the mind, body, and soul. The poses can be held still or flowed through. Both can reduce the symptoms of Parkinson's disease by promoting relaxation. Other advantages consist of: • Sharper awareness of movements and activities; • Improved awareness of appropriate body alignment and posture; and • Enhanced flexibility.

• Better breath support and control; enhanced core strength and balance, which lower the risk of falls;

2-Breathing Exercises,

In stressful or anxious situations, breathing exercises provide an easy and powerful approach to de-stress. A condition of great physical arousal is experienced by the body during times of stress. An elevated heart rate, tense muscles, or shallow breathing could be observed.

3-minute Relaxation Routine,

• Pick a crucial term, such as "calm,""relax," or "peace."

• Use your keyword to focus on unwinding. Be mindful of your breathing. Breathe deeply for a moment, then hold it.

• Tension your face, arms, or legs, or any other group of muscles, while holding your breath.

• Let go and relax the stiff muscles as you exhale. As you let go, keep repeating your key phrase.

• For three minutes, repeat with a different muscle group each time.

4-Consider Massage Therapy,

Many individuals who have Parkinson's disease are aware of the advantages of massage. Numerous local malls are among the locations where massages are offered. Certain advantages could be less stiffness and trembling; better sleep; more endurance throughout the day; less anxiety; and a stronger sense of calm.

Complementary therapies for anxiety in Parkinson’s disease

Complementary therapies are a growing group of treatments that may improve the symptoms of Parkinson's disease without medication. Complementary therapy approaches for several symptoms of Parkinson's disease – art therapy and music therapy.

Meditation

A variety of methods are used in meditation to help people calm their minds and turn inside. Not only may meditation be used to reduce stress in a variety of circumstances, but it has also been applied to Parkinson's disease.

During mindfulness meditation, an individual maintains a concentrated awareness of their thoughts, feelings, physical sensations, and the environment. A few small-scale clinical research have looked into whether practicing mindfulness reduces both the motor and non-motor symptoms of Parkinson's disease. There are some indications that mindfulness can, over time, reduce stress and promote healthy behaviors, despite the inconsistent results.

Psychotherapy

While the preceding suggestions can help reduce stress and anxiety, extra assistance (other than medicine) may be necessary to manage anxiety. Anxiety associated with Parkinson's disease can be effectively treated with psychotherapy. Cognitive behavioral therapy (CBT) is one of the most widely utilized psychotherapy treatments for stress and anxiety in Parkinson's disease.

Practically altering a thinking process or behavior is the main goal of cognitive behavioral therapy (CBT). It is more focused on the immediate application of a solution than on the underlying cause of a symptom.

Cognitive behavioral therapy is based on the fundamental idea that an individual's subjective response to an experience can predict the extent to which that experience will affect them. Even the same experience might affect two people very differently. CBT offers interventions to teach the body to respond to experiences differently than it typically would to take advantage of this variability.

Among many other problems, cognitive behavioral therapy (CBT) has been used to treat eating disorders, chronic pain, anxiety disorders, and anxiety disorders of many kinds, not simply those linked to Parkinson's disease. To reduce and remove avoidance behaviors and encourage problem-solving, anxiety interventions may involve patient education, self-soothing, deep breathing, progressive muscle relaxation, cognitive restructuring, and graduated exposure.

Here is an example of how CBT might work for someone with Parkinson's disease:

Let's take an example where a person suffering from Parkinson's disease is afraid to go to a restaurant for fear of spilling anything or embarrassing himself.

When a person with Parkinson's disease replicates a restaurant meal with progressively more anxiety-provoking events until he is ready for the final exposure of really going out to dinner at the restaurant, cognitive behavioral therapy (CBT) may be used to help him overcome his fear. Numerous objectives will be achieved by those exposures.

1. One objective is to alter the person's cognitive notion that, when dining out, he will invariably spill and humiliate himself. With the exposure, he will be able to observe that he can be in a restaurant without spilling anything.
2. Changing the cognitive notion that he will undoubtedly be ashamed if he spills is the next objective. He will realize that, if he does spill, probably no one will be the wiser.
3. The ultimate objective is to alter his cognitive view that he needs to always avoid embarrassing himself. Through the exposure, he will learn that if he does spill and someone notices and is concerned, he may utilize the relaxation skills he has been taught to handle the embarrassment and enjoy the evening out regardless.

Neurofeedback:

With the help of electroencephalography, or EEG, a kind of computerized real-time brainwave monitoring, a person can learn how to manipulate and adjust their brainwaves to self-regulate brain activity. This technique is known as neurofeedback. Numerous diseases, including ADHD, addiction, pain, and other conditions, have been researched about this technique's potential treatment. The majority of the studies on neurofeedback with Parkinson's disease have focused on whether it can enhance motor symptoms and balance rather than anxiety. There is a tiny amount of literature on the topic. Though not particularly about Parkinson's disease, neurofeedback training has been researched for generalized anxiety.

III: Evaluation phase:-

This phase aimed to evaluate the effectiveness of the Tai Chi exercise application on stress and anxiety among patients with Parkinson's disease. This was done by giving a posttest similar tools to the pretest past two months.

Statisticalanalysis:

The SPSS version (19) was used for both data entry and analysis. Numbers, percentages, and mean standard deviations were used to display the data. The qualitative variables were compared using a chi-square test. Quantitative data were reported as mean standard deviation (SD) if they were normally distributed. Either the Fisher's exact test or the Chi-Square test was used to assess how comparable the demographic attributes of the two groups were. To look for variations in physiological parameters across the groups, the repeated measurements of analysis of variance (RM-ANOVA) test was used. P-Values less than 0.05 are regarded as statistically significant.

Results:

Table 1 illustrates that the Parkinson's diseasepatients mean age was **56.34 ± 4.67** yearsold.Regarding sex, 56% of them were female, 70% of the studied sample were living in urban areas and 40% of them had secondary education.

Table (2): Illustrates that there were highly statistically significant differences found between patients' knowledge regarding Parkinson's disease pre and post-awareness program (P<0.001).

According to **Table 3**, 64% of patients had a poor knowledge level regarding Parkinson's disease before the introduction of the awareness program. However, following the implementation of an awareness program post, their level of knowledge increased to a good level (94.0%) with highly statistically significant differences (P<0.001).

Table (4): Illustrates that there were highly statistically significant differences found between patients' practices regarding Parkinson's disease pre and post-awareness program (P<0.001).

Figure (1): Demonstrates that 65% of the studied patients had unsatisfactory total practice regarding Parkinson's disease pre-awareness program, which improved post-awareness program, and 83% had satisfactory total practice level regarding Parkinson's disease.

Table 5 shows that in the pretest, the majority of studiedParkinson's diseasepatients (70%) had high perceived stress, and (30%) had moderate levels of stress. In the post-test, the majority of studiedParkinson's diseasepatients (88%) their stress levels and had low stress, and (12%) had moderate levels of stress with A significant decrease and improvement detected pre and post-awareness program **application**.

Table 6 shows that in the pretest, the mean and standard deviation of the level of stress among studiedParkinson's diseasepatients is 32.77±4.33. In the post-**application**, the mean and standard deviation of the level of stress among studiedParkinson's diseasepatients is 12.31±2.22 with a highly statistically significant difference found pre and post-awareness program **application** among studiedParkinson's disease patients**.**

Figure2 predicts that there was a significant reduction in the level of stress among the studied Parkinson's diseasepatients post-awareness program application. The assessment of the post-test stress level displays that (72%) had a mild level of stress, (28%) had a moderate stress level, and none had severe stress.

Table 7 shows that anxiety mean scores were lower post-awareness programapplication in comparison to their anxiety mean scores pre-awareness programapplication, with a statistically significant difference among the studied Parkinson's diseasepatients (p<0.001).

Figure3 predicts that there was a significant reduction in the level of **anxiety** among the studied Parkinson's diseasepatients post-awareness program application. The assessment of the pre-**awareness programanxiety** level displays that (48%) had a high level of **anxiety** compared to no one had (0%) a high **anxiety** level post-**awareness program**.

Table1:Personal data among the Parkinson's disease patients (n-100)

Personal data	Parkinson's diseasepatients (n=100)	
	No	%
Age		
M±SD	**56.34 ± 4.67**	
Sex		
Male	44	44
Female	56	56
Residence		
Urban	70	70
Rural	30	30
Education		
Illiterate	22	22
Primary	28	28
Secondary	40	40
University	10	10

Table (2) Comparison of patients' knowledge regardingParkinson's disease pre and post-awareness program(N-100)

Knowledge items	Pre-awareness program		Post-awareness program			lue
	No					
Definition						01**
Causes						01**
Risk factors						01**
Signs and Symptoms						01**
Complications						01**
Treatment						01**
Diagnosis of Parkinson's disease						01**
Complications of Parkinson's disease						01**
Prevention of Parkinson's disease						01**

**; Highly significant at p-value < 0.001

Table (3): Total knowledge level distribution among Parkinson's disease patients pre and Post of awareness program implementation (n=100)

Patients'knowledge level	Poor		Average		Good			-value
	No.	%	No	%	No	%		
Pre-awareness program implementation	66	64.0	32	32.0	4	4.0		
Post-awareness program implementation	0	0.0	6	6.0	94	94.0	**95.83**	**0.001****

(**) Highly significant at P<0.001

Table (4) Comparison of patients' practice regardingParkinson's disease pre and post-awareness program(n-100)

Patients' practice	Pre-awareness program implementation				Post-awareness program implementation				F	P
	Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory			
	No	%	No	%	No	%	No	%		
Breathing Exercises	48	48.0	52	52.0	3	6.0	94	94.0	99.43	0.000**

3-minute Relaxation Routine	54	54.0	46	46.0	8	8.0	92	92.0	87.24	0.000**
Massage Therapy	66	66.0	34	34.0	12	12.0	88	88.0	90.55	0.000**
Yoga or Tai Chi	68	68.0	32	32.0	14	14.0	86	86.0	96.22	0.000**
Neurofeedback	80	80.0	20	20.0	10	10.0	90	90.0	88.43	0.000**
Psychotherapy	70	70.0	30	30.0	18	18.0	82	82.0	86.24	0.000**
Meditation	86	86.0	14	14.0	14	14.0	86	86.0	92.55	0.000**

(**) Highly significant at P<0.001

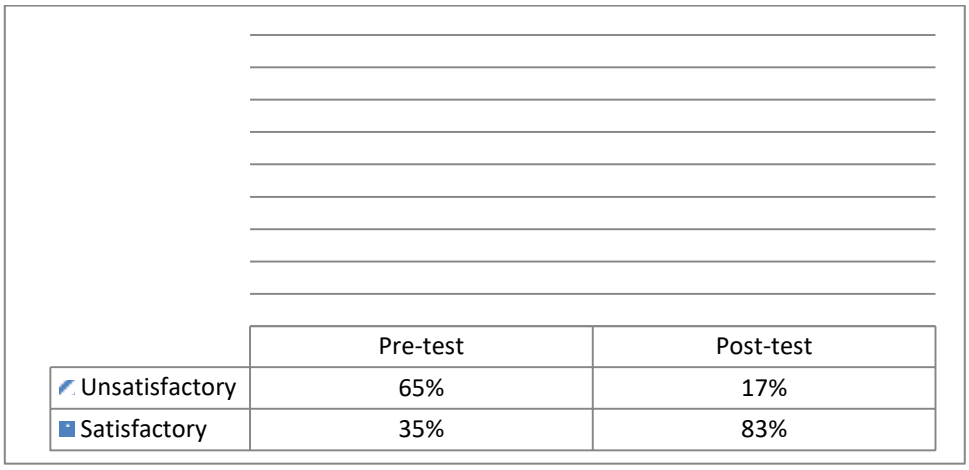

Figure (1): Total knowledge distribution among Parkinson's disease patients prior post- the awareness program (n-100)

Table 5: Differences between the stress levels among the studied Parkinson's disease patients pre and post-awareness program **(n=100)**

Level of Stress	**Pre-** awareness program		**Post** awareness program		**P –value**
	No	**(%)**	**No**	**(%)**	
Low Stress	0	0	88	88	<0.001*
Moderate Stress	30	30	12	12	
High Perceived Stress	70	70	0	0	

Table 6: Differences between the stress levels mean scores among the studied Parkinson's disease patients pre and post-awareness program **application (n=100)**

Items	**Pre-**awareness program	**Post** awareness program	**P –value**
	Mean Standard deviation	Mean Standard deviation	
Stress mean scores	32.77±4.33	12.31±2.22	<0.001*

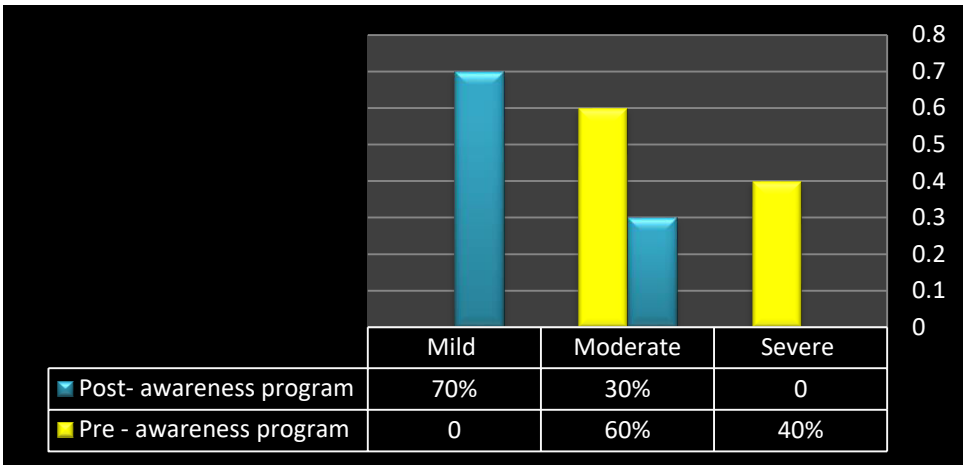

Figure 2: Total stress levels amongthe studied Parkinson's diseasepatients pre and post-awareness program application (n=100)

Table 7: Differences between the studied Parkinson's diseasepatients regarding their anxiety means scores pre and post-awareness program **application (n=100)**

Items	**Pre-**awareness program	**Post-**awareness program	t-test	**p-value**
Anxiety Scale Scores	38.48 ± 8.97	24.33 ± 2.52	14.34	<0.001*

*= significant at p<0.001 level.

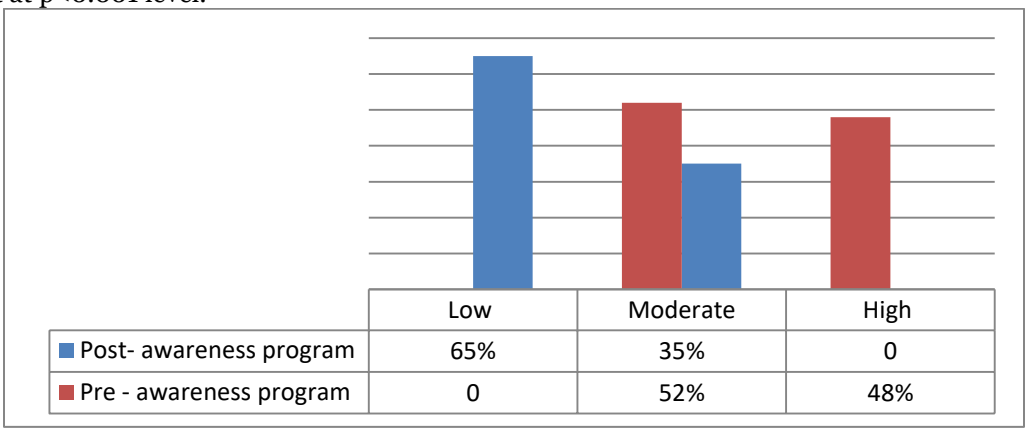

Figure 3: Total anxiety levels amongthe studied Parkinson's diseasepatients pre and post-awareness program application (n=100)

Discussion:

According to **Riedel et al. (2019),** anxiety and stress disorders are prevalent nonmotor psychiatric comorbidities in idiopathic Parkinson's disease that lead to worsening quality of life, greater care dependency, and more caregiver discomfort. This article provides a good summary of the research that has examined the impact of cognitive behavioral therapy (CBT) on anxiety in Parkinson's disease (**Hanna & Cronin-Golomb, 2018**). However, one randomized controlled trial found that receiving neurofeedback led to improvements in overall functioning as well as a reduction in anxiety symptoms. While these findings are promising, more research is necessary to determine whether neurofeedback might alleviate Parkinson's disease-related anxiety (**Lan et al., 2019**).

The study's findings demonstrated that the average age of the patients with Parkinson's disease was 56.34 ± 4.67 years. Of these, two-fifths had completed secondary education, over half were female, and less than three-quarters lived in urban areas.

The present study's findings indicated that patients' pre- and post-awareness program knowledge about Parkinson's disease differed in highly statistically significant ways. According to the researchers, this result showed how implementing an awareness program had a significant impact on the stress levels of Parkinson's disease patients, meeting their requirements and advancing knowledge.
The study's findings indicate that before the implementation of the awareness program, less than two-thirds of patients possessed inadequate knowledge about Parkinson's disease. However, their degree of knowledge improved to a decent level with highly statistically significant differences after the execution of an awareness campaign post. From the perspective of the researchers, this result validated the effectiveness of mindfulness training in lowering patients' stress levels.

The current study's findings demonstrated that patient behaviors about Parkinson's disease before and after an awareness program differed in a highly statistically significant way. According to the researchers, this result validated that awareness program implementation was successful in raising practices.

The study's findings showed that in Parkinson's disease, roughly two-thirds of the patients had unsatisfactory total practice before the implementation of post-awareness programs, which improved with time and led to the majority of the patients having satisfactory total practice levels. According to the researchers, this result validated the accomplishment of the awareness program's goal, which assisted in enhancing knowledge and had a positive impact on their understanding.

According to the study's findings, the mean stress ratings of the Parkinson's disease patients were lower than those from the pretest; less than two-thirds of the patients had high perceived stress, and over one-third had moderate levels of stress. The majority of the Parkinson's disease study patients had low-stress levels on the post-test. The impact of the awareness program on stress was found to have significantly decreased and improved in the investigated Parkinson's disease patients both before and after the program's adoption. According to the researchers, this result demonstrated how the awareness program's implementation had a good impact on the patient's stress levels.

According to the study's findings, when Parkinson's disease patients were exposed to an awareness program, their stress levels significantly decreased. This finding is consistent with a study by **Zheng et al. (2019**), which after implementation discovered that patients' stress expression was lower post-intervention than pre-implementation. Researchers also discovered that the group that engaged in five weekly one-hour workouts over 12 weeks did not observe a statistically significant decrease in their self-reported stress levels. This finding is corroborated by earlier research showing that exercise sessions considerably reduced participants' reported stress levels and elevated their moods (**Caldwell et al., 2021**).

According to the researcher, it demonstrated how well the awareness program was implemented and how it assisted Parkinson's disease patients in reducing their stress levels. **Shalash et al. (2018**) investigated non-motor symptoms using the BDI score in two recent Egyptian research and discovered the incidence of depression. **Ragab et al. (2019**) discovered a 47.5% prevalence. Numerous research by **Aarsland et al. (2022**); and **Nègre-Pagès et al. (2019**) have reported in the literature that a high prevalence of stress is associated with Parkinson's disease.

Following the use of post-stress management exercises, the current study's findings showed a considerable reduction in the level of stress among the Parkinson's disease patients under investigation. This result was supported by a study by **Steffen et al. (2020),** who looked into how stress management exercises affected stress reduction and discovered that stress decreased after using stress management exercises. The results aligned with the study conducted by **Yazhini et al. (2024**), which found that the stress management exercise effectively reduced the stress levels of the study population.

It proved the usefulness of the stress management exercise program. According to the researchers, stress management has been demonstrated in the past to lessen or treat psychological and physical illnesses (**Huang et al., 2021**), including ailments like cognitive impairment (**Lin et al., 2021).**

According to the current study's findings, the anxiety levels of the Parkinson's disease patients under investigation significantly decreased after they applied for the awareness program. Compared to no one having a high anxiety level after the awareness program, the assessment of the sample's anxiety level before the program shows that less

than half of the participants experienced high anxiety. It validated the application of the awareness program's success, according to the researcher. In addition, a study by **Lin et al. (2021**) looked at how participants' awareness programs affected their anxiety, and the findings indicated that the program lowered anxiety levels in the group under study.

The results of the present investigation align with those of **Wang et al. (2019**), who discovered that exercise can alleviate anxiety and address several prevalent psychosomatic disorders. The results of this study also align with those of **Zhao et al. (2021),** who found that training improved the psychosocial and physical impairment of individuals with limited physical mobility.

Due to its ability to reduce sympathetic nervous system activity, exercise may have this effect. Researchers have demonstrated through the measurement of salivary cortisol levels that exercise practice can produce specific cell mediators, such as transforming growth factor-β and interleukin. According to **Esch et al. (2020**), the production of these mediators improves life quality and reduces anxiety and psychological stress. Additionally, the changes in the brain that training brings about might enhance participants' ability to control their feelings of melancholy and anxiety, improving the emotional states of patients (**Huang et al., 2021**).

These findings aligned with those of **Shalash et al. (2018**), who discovered that anxiety was the main predictor of QOL impairment in patients from Egypt. The results align with previous research (**Chuquilín-Arista et al., 2020; Menon et al., 2021**) that demonstrated non-motor illness characteristics had an independent influence on the impact of Parkinson's disease patients.

According to our study's findings, Parkinson's disease sufferers can effectively reduce their stress and anxiety through training. The favorable benefits of exercise on balance, physical function, and falls, as reported by **Chuquilín-Arista et al. (2020**), provide support for this finding and imply that exercise is a suitable physical activity for individuals with Parkinson's disease and may even be effective as a therapeutic exercise.

Conclusion:

It was determined based on the study's results and hypothesis that the awareness program application has a significant improvement in knowledge and practice with a reduction in mean post-test stress and anxiety among Parkinson's disease patients**.**

Recommendations:

The following suggestions are put forth in light of the findings of the current study:

- It is stronglyadvised to apply continuous training for Parkinson's disease patients about the importance of the awareness program application regarding knowledge, practice, stress, and anxiety management strategies to be able to use them as a part of routine care.
- To enable generalization, more investigation and replication of this work with a large sample size are needed.

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