

EFFECT OF BIOPSYCHOSOCIAL MODEL ON CAREGIVERS' SELF-EFFICACY AND COPING AMONG PARKINSON'S ELDERLY

Zainab Gazar Alkotb Alagamy¹, Evon S. Shokre², Mervat amin Sayed, Safa Mohamed Amin Mohamed⁴, Tyseer Bauomei Fahmei⁵, and Amira A. El-Houfey^{6*}

¹ Community and Geriatric Health Nursing, Faculty of Nursing, Fayoum University, Egypt

²Psychiatric Health Nursing, Faculty of Nursing, Fayoum University, Egypt

³Community Health Nursing, Faculty of Nursing- Fayoum University, Egypt

⁴ Psychiatric Nursing and Mental health ,Benisuef university

⁵ Geriatric Health Nursing, Faculty of Nursing, Modern University for Technology and Information (MTI)

^{6*}Community Health Nursing, Faculty of Nursing, Assiut University, Egypt

***⁶Correspondence author:**

Name: Amira El-Houfey,

Emails. elhoufeya@gmail.com

Abstract:

Background: Parkinson's disease (PD) is a severe global health issue, presenting numerous challenges for patients and their families. The biopsychosocial model suggests comprehensive PD care. The goal of this study was to evaluate how the biopsychosocial model affected the self-efficacy and coping mechanisms of caregivers who were PD patients. A quasi-experimental research design (pre and post-tests) was used. The setting for this study was a neurology outpatient clinic at Al Salam International Private Hospital, Cairo. The participants were a purposive sample of 60 PD patients and 60 caregivers. A structured interview questionnaire with questions about the characteristics of caregivers and their patients was one of six tools employed. Parkinson's Disease Questionnaire-8 Items (PDQ-8), Unified PD Rating Scale (UPDRS-3), Revised Scale for Caregiver Self-Efficacy (RSCSE), and Parkinson's Disease Knowledge among the Elderly and Their Caregivers V: The Coping Health Inventory for Caregivers (CHIPS); IV: The Scale of Quality of Life of Caregivers (SQLC). The results revealed that on the post-tests, 43.3% of caregivers had a greater level of PD knowledge than did 13.3% on the pre-test. The findings also revealed that 86.7% of carers had a high level of self-efficacy on the post-test as opposed to 55.0% on the pre-test. The use of the biopsychosocial model substantially impacted carers' self-efficacy and coping among older Parkinson's disease patients, according to the study's findings. Researchers may additionally recommend that the biopsychosocial health education model be applied in all PD departments to improve the level of care provided to caregivers and their patients.

Keywords: Parkinson's Disease, Coping Strategies, Self-efficacy, Biopsychosocial Model, Caregiver, Patients.

Introduction :

Nowadays Parkinson's disease (PD) is a major health problem, that affects approximately 1% of women and men worldwide, specifically among the elderly (Martinez-Martin et al, 2011). (1) Most Parkinson's patients are cared for by unofficial support as family members, friends, or other untrained caregivers. These carers experience physical and mental anguish, are restricted in their personal and social activities, and are financially burdened when caring for people with chronic and disabling conditions (2).

A caregiver's stress level should be evaluated to determine its characteristics and contributing causes. This kind of knowledge could be used to create successful strategies that reduce caregiver suffering. A better standard of care and an extension of patients' permanence at home will result from reducing the strain and improving caregiver quality of life. (3)

Parkinson's disease (PD) is caused by the loss of nerve cells in the brain responsible for producing the neurotransmitter dopamine. Dopamine helps to control and coordinate physical movements. Risk factors include genetics, cerebrovascular disease, drug-induced Parkinsonism, chemicals and herbicides used in agriculture, air pollution from industry or vehicles, and cerebrovascular disease (4). Tremors, brassiness, stiffness, agnosia, decreased balance and coordination, depression, urinary problems, constipation, skin issues, and cognitive impairments are among the 10 key symptoms. There are drugs available to assist lessen symptoms and maintain quality of life. Surgery, nutritional guidance, occupational therapy, speech therapy, and physical therapy are all examples of supporting therapies. (5,6).

Individuals with Parkinson's disease (PD) appear with varied degrees of disability owing to physical and mental impairment. As a result, those who are closest to PD patients experience stress related to their work as caregivers for people with progressive conditions (7). Self-efficacy is a caregiver's asset that may be critical to the quality of life of caregivers of people with Parkinson's disease. The ability to take care of oneself and get help when needed, the capacity to deal with challenging patient behaviors and other care-related issues, and the capacity to manage distressing thoughts and negative emotions brought on by caregiver activities have all been emphasized in the concept of self-efficacy (3). So, self-efficacy is a sense of personal competence and control over the care situation. Parents will be capable of handling the situation if they believe they can handle it and that they have the skills to delegate work, take a break, or seek assistance when necessary. And the caregiver's well-being will benefit as a result(3, 7).

Coping strategies are cognitive and behavioral efforts required to manage specific external and/or internal demands that are perceived to be taxing or going over the person's resources. It can help us better understand how elders with PD and their caregivers cope with their circumstances(8). Some families actively seek out information on the condition and its treatments, work to maintain

family harmony by disclosing problems and asking for emotional support from other family members, seek social support, express their emotions, look for a place to be by themselves, and participate in hobbies, and have higher levels of self-efficacy and self-confidence (9,10). The nurse plays a significant role in observing, evaluating, diagnosing, determining the results of interventions, and treating patients with Parkinson's disease. In general, it appears that nurses collaborate effectively and openly with other professionals on multidisciplinary teams (11).

Significance of the study:

Less focus has been placed on the impact of caregivers' resources on how they manage their physical, mental, and social well-being as well as how they adapt to the patient and the care setting. According to the Biopsychosocial Model, it is crucial to recognize and enhance caregivers' resources to promote easier patient adaptation(3). The male-to-female ratio was 4:1. Patients over 75 years old exhibited the highest age-specific prevalence rate that was observed. Compared to other Arab nations, the governorate in Upper Egypt's Nile Valley has a high frequency of Parkinson's disease. (11).

Purpose:

This study aims to assess the influence of the biopsychosocial model on caregivers' self-efficacy and coping strategies for Parkinson's in elderly patients.

Research Hypothesis:

H0: Caregiver self-efficacy and coping with elderly Parkinson's patients are unaffected by the biopsychosocial model.

H1: The biopsychosocial model affects Parkinson's caregivers' self-efficacy and ability to cope.

Methods:

1. Research design:

A quasi-experimental design (pre- and post-test) was conducted for this study.

2. Study Settings:

This study was performed at Neurology Out-Patient Clinics for Parkinson's Elderly at Al Salam International Private Hospital, Cairo.

3. Sampling:

Researchers selected 60 patients with PD and 60 caregivers through a purposive sampling method. Caregivers who met specific criteria, such as being a relative of an older adult with PD and being

the primary caregiver based on reported hours, were invited to participate. Those with severe mental illnesses were excluded from the study.

For sample size calculation, the researchers used the online Creative Research Systems sample size calculator website. It has been searched, reviewed, and checked for calculated results based on known formulas for common research objectives. With a study power of 90%, the required sample size was equal to 60 patients and their caregivers

Data Collection:

Data were collected with an Individual Information Form, A Structured Interview Questionnaire, and Parkinson's elderly and their caregivers' knowledge about PD.

4 Tools

To achieve the purpose of the study, three **tools** were utilized for data collection.

Tool I: A Structured Interview Questionnaire

Owen CL created it in 2022, and the researchers adopted it. It is used to gather information about the traits and expertise of senior people with Parkinson's disease and their caregivers to analyze the burden, gauge the strength of social support, and gauge psychological well-being (12). There are four sections:

Characteristics of Parkinson's elderly and caregivers It contains:

Part one: Characteristics of the Parkinson's elderly: such as age, sex, place of residence, marital status, duration of disease, motor stage, and progression of PD.(11,12)

Part two: characteristics of the caregivers include information on their age, marital status, education level, employment status, place of residence, history of Parkinson's disease in the family, consanguineous relationship, and participation in PD education programs.

Part three: PD knowledge among elderly Parkinson's patients and their caregivers as determined by a structured interview questionnaire (13). It asks six questions about the definition, signs and symptoms, underlying reasons, coping mechanisms, and supporting interventions.

Scoring system:

The scores for the six questions total three points. For incorrect responses, a score of zero was awarded; for the correct but insufficient response, a score of one; and for the correct response, a score of two. It was divided into three groups: 6 is the lowest level of understanding, 7 is average, 9 is good, and 12 is excellent.

Part Four: Eight Items in the Parkinson's Disease Questionnaire (PDQ-8) is a self-administered, short-form questionnaire made up of eight items, each of which represents one domain of PDQ-39. Huang TT created it in 2011. Scores range from 0 (no problem) to 4 (constant problem/unable to perform it) for each item. The total score for the 8 items is divided by the highest possible score (of scores/32), yielding the PDQ-8 Summary Index (PDQ-8 SI), which is reported as a percentage. HRQoL improves as the index decreases (14).

Tool II: Unified PD Rating Scale (UPDRS-3.0): it was created by Goetz, C. G. in 2008 The UPDRS is a combination scale made up of the four subscales of complications, activities of daily living, motor assessment, and mental status. The fourth subscale, "complications," has a heterogeneous scoring system. The first three subscales are focused on measuring PD symptoms, and items are uniformly scored (ranging from 0 = normal to 4 = severe). (15)

Tool III: The self-efficacy of caregivers was assessed using the Revised Scale for Caregiving Self-Efficacy (RSCSE) (Steffen et al. 2002). The unique instrument for assessing the self-efficacy of caregivers is this one. There are 15 separate parts in all. Getting respite (five items), dealing with obnoxious patient behaviors (five items), and controlling upsetting thoughts (five items) are the three caring domains that can be scored. Another option is to compute total scores. We did not use the scale's items on "responding to disruptive patient behaviors" since their content was insufficient for the study's target audience. This is the case because the RSCSE's initial intended audience was dementia caregivers. Total scores were preferred due to the minimal number of items covered in each domain. (16)

Tool IV: Scale of Quality of Life for Caregivers (SQLC), Glozman's SQLC, makes an effort to quantify the toll that sickness has on caregivers' social, recreational, and professional activities (4 items), as well as the stress brought on by the everyday obligations associated with providing care for patients (7 items). The more severe the impact on caretakers, as measured by this scale, the lower the score. Four levels of caregiver distress can be identified: none, 140–149; mild; 140–100; moderate; 99–86; and severe, less than 85 (17).

Tool V: The Coping Health Inventory for Caregiving (CHIPS), developed by McCubbin et al. in 1983, was used to assess coping strategies. To assess the caregiver's responses to questions on how they manage family life when an elderly person has a serious illness, a 45-item survey was developed. Scores are based on three different scales: understanding the healthcare situation through communication with other parents and consultation with the healthcare team (eight items), maintaining social support, self-esteem, and psychological stability (18 items), and maintaining family integration, cooperation, and a positive assessment of the situation (19 items). The Spanish translation of this study was used (18).

Reliability:

The reliability of the study instruments was assessed among 10 participants twice, two weeks apart, using the test-retest methodology. The two scores were then put side by side, using Cronbach's alpha to compare them. It was 0.78, showing that the tools were reliable in attaining the objectives of the study. (19)

Validity:

Five professors of community, psychiatric, medical surgery, and nursing, as well as one professor of pediatrics, served on the jury of five experts to assess the validity of the instruments' content and make any necessary modifications. All necessary adjustments were made.

Ethical Consideration:

The ethical research committee of the Faculty of Nursing at Modern University for Technology and Information (MTI) offered written consent, which was obtained. Elderly adults with PD and their caregivers were interviewed initially to explain the study's purpose, methods, and benefits. The elderly patients' caretakers provided both verbal and written consent. Everyone who participated in the study was made aware that it was completely voluntary and that they could stop at any time without suffering any consequences. We were able to reassure caregivers and elderly people with PD of their privacy and anonymity by coding all data and putting all paperwork in a closed cabinet. Individually (instruments 2, 3), or through in-person interviews (instrument 1), participants completed the questionnaires. They were informed that the study would not impair their physical or mental well-being.

Pilot study:

After the instruments were established and before the data collection began, the feasibility, pertinence, and time estimations were tested on six caregivers of older persons with PD, who made up 10% of the sample. No necessary modifications were performed. As a result, each individual was included in the complete sample.

Procedure:

To conduct a study on elderly people with Parkinson's disease, the researcher obtained written approval from the Faculty of Nursing and the Directors of Al Salam International Private Hospital. From November 2021 to the end of January 2022, data for the study were collected. The researcher introduced herself to the caregivers of the elderly participants and explained the study's goals, data collection procedures, and expected results. Detailed information was provided to help the caregivers understand the context and importance of the study.

The researcher visited clients either at home or at out patient clinic after getting written consent. Any questions they had about the study were addressed during the interview, and they were also asked to complete some of the measures (those that the research team thought to be more challenging, answering roughly half of the battery of questions). They can contact the study staff at any time by phone or email if they have any questions. Answers to every question in the battery were provided by everyone willing to participate.

The biopsychosocial model's broad goal is:

Giving care to elderly people with PD through the biopsychosocial model of intervention aids in preserving safety. Particular goals:

1. Describe the biological, social, and psychological variables that impact older persons with Parkinson's disease (PD) and their providers.
2. Give older people with PD who are caring for them biopsychosocial support to help them cope and adjust.
3. Increase the self-efficacy of caregivers and the coping strategies used by their elderly relatives with Parkinson's disease by including caregivers in the intervention.

The phase of assessment:

The structured interview questionnaire was given to each participant, and data were gathered using it. The features of elderly patients with Parkinson's disease and the level of knowledge of PD among caretakers were assessed using a structured interview questionnaire. The Intermediate Scale for Assessment of Parkinson's Disease was evaluated as well using a structured interview questionnaire referred to as Tool II (pre-test). The mental health of the caregiver was evaluated using the Caregiver Mental Health Inventory (MHI-38), Tool III (pre-test). To measure caregiver self-efficacy, researchers employed the Revised Scale for Caregiver Self-Efficacy (RSCSE) (Tool IV). To measure how illness affected caregivers' professional lives, researchers employed the Scale of Quality of Life of Caregivers (SQLC) (Tool V). By using the Coping Health Inventory for Caregivers (CHIPS), one can assess one's coping skills (Tool VI).

The phase of implementation:

Ten groups of caregivers and their elders were created. There are six elders and their caretakers in each group. In four intervention sessions, a biopsychosocial intervention approach was used with caregivers and their elderly clients. There were two weekly sessions. The Biopsychosocial Intervention Model is used to guide conversations in small groups and oral presentations regarding the nature of the condition and how it should be managed. There were pamphlets and scientific

brochures available. Using the Revised Scale for Caregiver Self-Efficacy (RSCSE) (Tool IV) to reduce the number of groups from 10 to 6 people per group, all necessary precautions against the infection pandemic were taken, including the use of hand sanitizers, wearing masks, and creating distances between people. The Scale of Disability for Caregivers was used to measure the effects of illness on caregivers' professional abilities, and the Scale of Quality of Life of Caregivers (SQLC) (Tool V) was used to measure the effects of disease on caregivers' professional abilities.

The first session covered the theoretical aspects of the disease's nature and effective management. Moreover, methods for administering drugs, such as the place, route, and dosage, and peer and family interactions served to provide social support. The session takes an hour. Oral presentations, small-group discussions, role-plays, comments, a pamphlet, and a mannequin for drug administration for the elderly and their caretakers were used as examples.

The second session covered oral hygiene, adequate exercise, food regimen, and eating problems. Oral presentations, conversations in small groups, role-plays, feedback, demonstrations, and re-demonstrations were used to illustrate it.

The third session included topics including promoting caregivers' coping mechanisms and the appropriate application of stress management approaches. Demonstrations included oral presentations, discussions in small groups, comments, the use of a brochure, and puppet theater.

The goal of the fourth session was to increase caregivers' self-efficacy. It was an hour long and included a break. It was demonstrated using an oral presentation, small group discussions, feedback, a pamphlet, and scientific brochures.

The phase of evaluation: Immediately following the program's conclusion, a post-test was conducted to reevaluate how well elders and their caregivers were adjusting to PD using a structured interview questionnaire. The caregiver's Coping Strategies Inventory (post-test) was used to reevaluate caregivers' coping mechanisms in response to stressful situations caused by PD. Using the caregiver's self-efficacy Likert scale (post-test), caregivers' self-efficacy was reevaluated. Based on the Biopsychosocial Model, a thorough revision session about PD therapy, adjustment, and enhancement of caregivers' coping mechanisms was used.

10: Statistical Analysis:

The collected data was tabulated and examined using SPSS version 22. Using the Excel program, the graphics were produced. Analytical statistics, such as repeated-measures ANOVA, as well as descriptive statistics, such as mean and standard deviation ($X+SD$) for quantitative data or number and percentage (No &%) for qualitative data, were both carried out.

11- Results:

Table 1 demonstrates that 51.6% of Parkinson's patients were between the ages of 50 and 65, with a mean age of 68.5. 58.3% of the patients who were the subject of the study were female. Regarding the length of PD, 40.0% of the patients in the study experienced PD for more than 5 years. 50% of patients are highly stable in terms of their motor stage. According to the Parkinson's Disease Questionnaire, the majority of Parkinson's patients—83.4%—had Continuous problems of HRQoL due to ongoing issues.

According to Table 2, 83.3% of caregivers were between the ages of 20 and 40. In terms of social standing, 85.0% of caregivers were married. Only 13.3% of caregivers were illiterate in terms of education. 36.7% of the studies on parents' jobs were unworked. 50% of the caregivers who were the subject of the study were sons. Regarding parents' family history of PD, 45% of the caregivers in the study had PD. 13.3% of caregivers who had PD were found to have it. family consanguineous, 86.7% of caregivers are not. Concerning caregivers' knowledge of PD, 25 % of caregivers were aware of it in some way.

Fig. (1) The results showed that on the prior and post-tests, most caregivers had more knowledge about PD and its consequences than they had on the pre-test. As a result, there were very statistically significant variations in the caregivers' knowledge levels on the pre-and post-assessments (P 0.0001).

Table 3 shows that UPDRS displays that most caregivers had improved on (mild mental, ADL, and motor exams) on the post-test compared to the pre-test (60% and 50%), (31% and 55%), and (35% and 40%), respectively. In contrast to the pre-test, they had made progress on serious complications on the post-test (30%, 20%). As a result, there were differences between the pre-and post-tests that were statistically significant.

Regarding the revised scale for caregiver self-efficacy (RSCSE), Table 3 shows the maneuvers that the caregivers had high levels of on the post-test compared to the pre-test (40% and 50%), (40% and 42%), and (12% and 40%), respectively (obtaining respite, responding to disruptive patient behaviors, and managing distressing thoughts). As a result, there were no differences that were statistically significant between the pre-and post-tests. (see **Figure 2**)

According to the scale of quality of life of caregivers (SQLC), the caregivers' professional, social, and leisure activities were all at high levels on the post-test compared to the pre-test (18% and 27%) and (20% and 50%), respectively. Therefore, the pre-and post-tests showed statistically significant differences (see **Table 3**).

The majority of caregivers had better moderate coping levels on the post-test compared to the pre-test (70.0% and 78.3%, respectively), according to the Coping Health Inventory for Caregivers (CHIPS). The pre-and post-tests showed statistically significant differences (see **Table 3**).

The Coping Health Inventory for Caregiver score and the caregiver and patient-related variables are correlated using Spearman rank correlation coefficients, as shown in **Table 4**. CHIPS showed a strong positive and significant correlation with most factors, except income and caregivers' occupation.

Figure 3 shows the extent of the program's impact on caregivers' post-test self-efficacy and ability to manage Parkinson's elderly care. The revised caregiver self-efficacy scale (RSCSE) and the caregiver quality of life scale (SQLC) both had a moderate impact size. The coping health survey for caregivers and UPDRS, which measures mental state, activities of daily living, motor examination, and problems, however, showed a significant effect size.

Table (1) The distribution of Parkinson's patients was studied. (N=60)

Items	No (n=60)	%
Age:		
50-	31	51.6
65-	19	31.7
75-88	10	16.7
M±SD	68 .5 ± 8.6	
Residency		
Urban	23	38.3
Rural	37	61.7
Sex		
Female	35	58.3
Male	25	41.7
Continuance of PD:		
3-11 years		
<5years	36	60.0
>5years	24	40.0
Motor stage (HY) :		
Low Stable	20	33.3
Worsening	10	16.7
High Stable	30	50
PDQ-8		
No problem	10	16.6
Continuous problem	90	83.4

Table (2) The distribution of caregivers studied for Parkinson's elderly (N=60)

	No(n=60)	%
Caregivers age		
20<40 ys	50	83.3
40<60 ys	10	16.6
Marital Status :		
Divorced	5	8.4
Widower	4	6.6
Married	51	85.0
Occupation:		
Worked	38	63.3
Unworked	22	36.7
Level of education :		
Illiterate	8	13.3
Primary education	10	16.7
High school	11	18.3
University	31	51.7
Caregiver :		
Sons	30	50
Father and mother.	10	16.7
Other	20	33.3
Income:		
Average	40	66.7
High	6	10.0
Low	14	23.3
Family background of PD		
Yes	27	45
No	33	55
Consanguineous relationship between parents:		
Yes	8	13.3
No	52	86.7
Receive consciousness about PD:		
Yes	15	25
No	45	75
Total	60	100

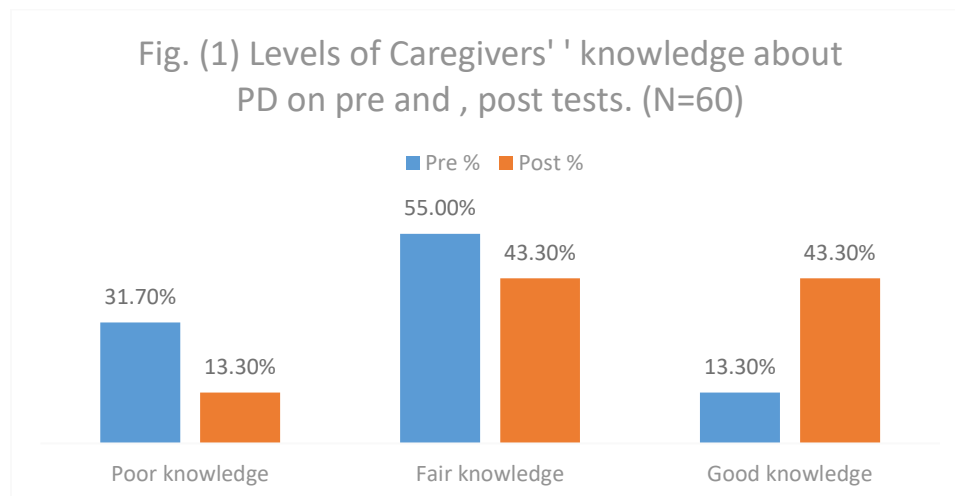


Fig. (1) Caregiver knowledge level in pre- and post-testing for Parkinson's disease. (N=60)

Table (3) Levels of Caregivers, The UPDRS, RSCSE, SQLC, CHIPS and among studied patients PD with on pre and, post-test. (N=60)

	Pre %			Post %			X and P – value
	Normal	Mild	Sever	Normal	Mild	Sever	
The UPDRS							
Mental	12	60	28	25	50	15	25.96 *** <i>P<0.001</i>
ADL	29	31	40	20	55	25	
Motor exam	18	35	47	25	40	35	
Complication	39	31	30	50	30	20	
RSCSE	Low	Moderate	High	Low	Moderate	High	
Obtaining respite	50	10	40	40	10	50	.37 NS .543
Responding to disruptive patient behaviors	10	50	40	19	39	42	
Managing distressing thoughts.	60	28	12	25	35	40	
Total	45	-	55	13.3	-	86.7	
SQLC							
Caregivers' professional	22	60	18	23	50	27	25.96 HS <i>P<0.001</i>
Social, and leisure activities	20	60	20	23	27	50	
Coping Health Inventory for Caregivers (CHIPS)	30	70	0	15	78.3	6.7	25.96 *** <i>P<0.001</i>

Note: PDQ-8: Parkinson's Disease Questionnaire-8 items. **UPDRS:** Unified PD Rating Scale. **RSCSE:** The Revised Scale for Caregiver Self-Efficacy. **SQLC:** Scale of Quality of Life of the Caregiver. **CHIPS:** The Coping Health Inventory for Caregivers.

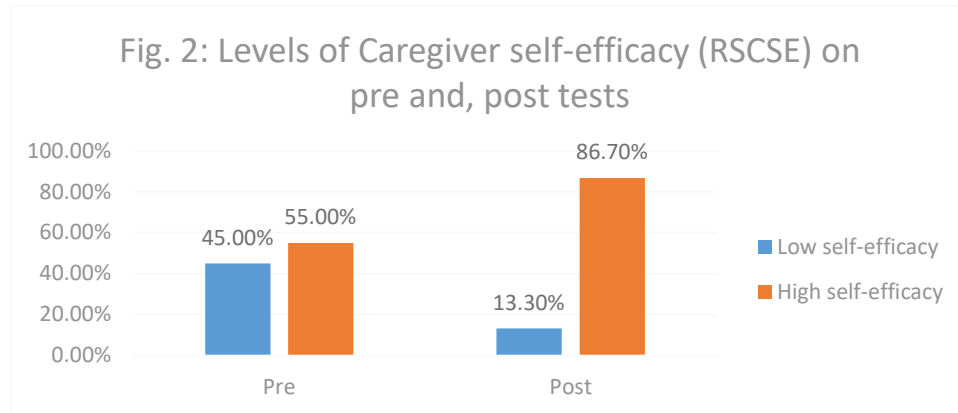


Figure (2) Caregiver self-efficacy (RSCSE) levels on pre and post-tests (N=60)

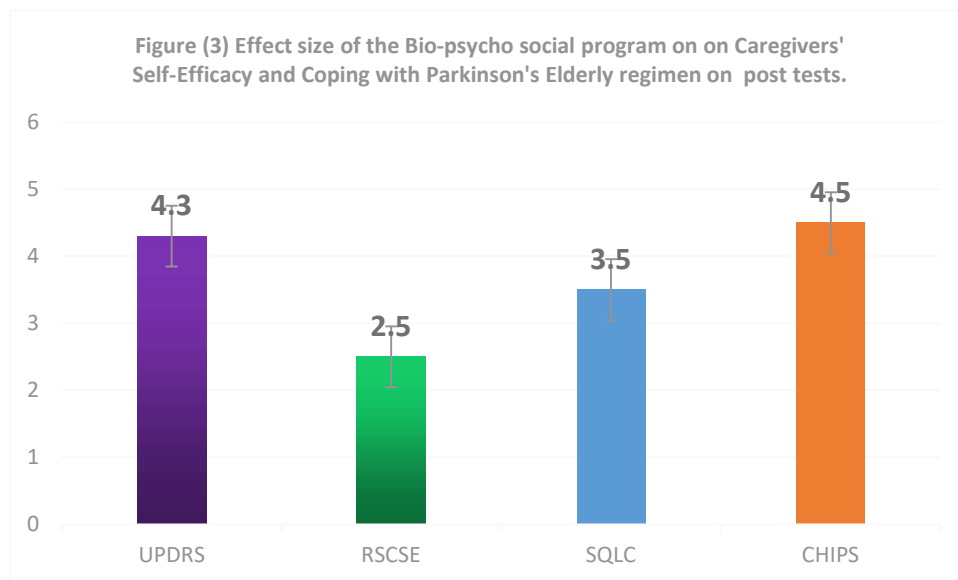


Figure (3) The size of the effect of the Biopsychosocial Program on Post-tests for Coping with Parkinson's Elderly and Caregivers' Self-Efficacy. (N=60)

Table 4: the correlation between patient-related factors and the scores on the coping health assessment for caregivers

Factors	<i>CHIP Scale</i>			
	Family integration	social Support	the healthcare situation	
Caregiver's age:	0.18****	0.20****	0.24****	
Patient's age:	0.23****	0.24****	0.32****	
Income:	0.02	0.01	-0.04	
Family history of PD	0.07	0.13**	0.16****	
Relationship between parent	0.01	0.25****	0.28****	
Taken any awareness of PD	0.18***	0.16****	0.30****	
UPDRS	0.15*	0.39****	0.30****	
RSCSE	0.27****	0.21****	0.15*	
SQLC	caregivers' professional	0.01	0.05	0.02
	social, and leisure activities	0.19*	0.11*	0.14*

Designations include ****, which denotes correlation significant at the level of 0.001, ***, which denotes correlation significant at the level of 0.005, **, which denotes correlation significant at the level of 0.01, and *, which denotes correlation significant at the level of 0.05. The Coping Health Inventory for Caregivers is known as CHIPS.8 items make up the Parkinson's Disease Questionnaire. Unified PD Rating Scale (UPDRS). The RSCSE stands for the Caregiver Self-Efficacy Revised Scale. Scale of the Caregiver's Quality of Life

Discussion:

Parkinson's disease is a chronic, dangerous condition that requires intensive disease management, behavior alteration, and permanent family support. Consequently, it is not unannounced that the diagnosis of PD can have a harmful psychological causal factor on families (20). Past studies have revealed that in the period following diagnosis, caregivers from the family may suffer heartbreak, low self-efficacy, and coping disorders. Patients have also dramatic play evidence of psychological symptoms of PD, such as depression and other adjustment problems (Yang et al., 2019) (21). American Parkinson Disease Association later released position evidence highlighting the importance of psycho-social care for people with Parkinson's disease (apdaparkinson.org, 2023) (22).

The important aim of this study is to examine the impact of the biopsychosocial model on caregivers who work with senior Parkinson's disease patients. According to the current study's hypothesis, Parkinson's patients' caregivers who had crucial biopsychosocial therapy model interventions would demonstrate improved biological, psychological, and coping abilities on the post-test compared to the pre-test. Additionally, in the post-test, compared to the pre-test, PD patients who receive the biopsychosocial intervention model will have high self-efficacy for illness administration.

According to the current study, the caregiver's knowledge of Parkinson's disease was greater regarding the patient's PD on the post-test than it was on the pre-test. This outcome was in line with the findings of Duits et al. (2021) (23), who found a substantial difference in caregiver understanding of PD, complications, and management between before and after program implementation. According to the researcher, the caregiver's awareness of PD and its management grew since health education about it was provided, and communication with the caregiver was made easier because we used online sessions and online communication. Patients who used the biopsychosocial model will be better at coping on the post-tests than on the pre-test, according to hypothesis one.

According to the current study, there was a substantial improvement in patients' PD adjustment, which is to say that patients' PD adjustment levels were higher on the post-test than they were on the pre-test. This result was consistent with Wallace's (2021) findings that improving coping mechanisms aided in the improvement of PD adjustment. These findings, in the researcher's opinion, can be connected to the efficiency of social and psychological assistance (24). Also in 2021, Fleisher et al. did research titled "Diagnosis, Therapy, and Follow-Up of PD in Patients." They concur with these results(25).

This study showed that there was a considerable improvement in how patients and caregivers were coping with PD in the post-tests compared to the pre-program in terms of pre-and post-tests. This result was in line with Cheng's findings from the year 2022, which revealed that family caregivers had improved coping and self-efficacy following the intervention (26).

Maoni (2019) discovered that the majority of caregivers had a high level of PD coping immediately following the improvement of their coping mechanisms in the same context (27). Additionally, this outcome is consistent with Cheng's findings from 2022, which showed a significant connection between psycho-social aspects, quality of life, and coping mechanisms in PD patients (26). According to the researcher, patients' coping skills improved after receiving instruction on how to apply coping mechanisms in their daily lives.

About the second hypothesis, "caregivers who received the biopsychosocial model will have stronger self-efficacy on the post-tests than on the pre-tests. According to the current study, carers' self-efficacy toward PD significantly improved between the pre-and post-intervention

assessments. This outcome was consistent with Cheng et al. (2022), who discovered that enhancing carers' coping mechanisms improved self-efficacy and social support, which were important determinants of quality of life (26).

In a similar vein, Baertschi (2020) noted that giving carers emotional, psychological, and physical support boosted their confidence and enhanced their capacity to take care of their patients (28). Additionally, according to Duits et al. (2021), giving carers social and psychological support as well as PD instruction enhances the quality of their care (23). The success of the health education sessions addressing PD care, good management, the best ways to deal with PD patients, and the notable increase in PD patients' coping mechanisms based on the application of the biopsychosocial model may be used to explain this outcome. The current study demonstrated that the biopsychosocial model had a significant influence on children's coping strategies (0.8) and a moderate effect on their caregivers' self-efficacy (0.5) after implementation of the model. This finding relates to the effect size of the biopsychosocial model on caregivers' coping strategies and their patients' self-efficacy. This finding was consistent with Yang et al. (2019) finding that caregivers have high coping levels after receiving the intervention (21). Also, these results were in line with Reich et al. (2019), who revealed that 89% of caregivers have an enhancement in their coping level and their patients have great self-efficacy after receiving the intervention (29).

This could be connected to the impact of the biopsychosocial model's adoption, which improved both the coping mechanisms of caregivers and the patient's self-efficacy. Therefore, the current study's proposed research hypotheses were approved.

Conclusion:

According to the results of the present study, the use of the biopsychosocial model improved caregiver self-efficacy and coping methods for patients with PD. It also helped the caregivers in the study have a greater understanding of PD and how to manage it.

Recommendations:

Based on the results of the current investigation, the following recommendations may be made: The biopsychosocial paradigm may be applied to the management of PD in both PD care facilities and outpatient clinics. Every caregiver of PD patients should be provided with the resources necessary to help their patients develop the appropriate coping mechanisms. Unquestionably, a standardized biopsychosocial paradigm for patients with PD has to be included in the nursing curriculum. Other research on a larger sample of patients and their caregivers should be carried out to guarantee the generalization of the findings.

Acknowledgment:

We would like to express our gratitude to everyone who agreed to take part in the study and gave their time to help us learn how to improve coping and self-efficiency for people with Parkinson's disease and their caregivers.

Declaration of Conflicts of Interest:

There is no conflict of interest between researchers.

Abbreviations:

PD:	Parkinson's disease.
ADL:	Activities of Daily Living.
PDQ-8:	Parkinson's Disease Questionnaire-8 items.
UPDRS	Unified PD Rating Scale UPDRS
(RSCSE)	The Revised Scale for Caregiver Self-Efficacy
SQLC:	The scale of Quality of Life of Caregiver.
(CHIPS)	The Coping Health Inventory for Caregiver

References :

- 1-Martinez-Martin P, Jeukens-Visser M, Lyons KE, Rodriguez-Blazquez C, Selai C, Siderowf A, (2011): Health-related quality-of-life scales in Parkinson's disease: critique and recommendations. *Mov Disord.*;26(13):2371–80.
- 2-Bogacheva, V. A., Kotsubinskaya, J. V., Mikhailov, V. A., & Alexeeva, T. S. (2019). COMPLIANCE WITH PARKINSON'S DISEASE FROM THE STANDPOINT OF BIOPSYCHOSOCIAL CONCEPT. *Neurology Bulletin*, 51(1), 20-24.
- 3-Kelly, M. J., Baig, F., Hu, M. T. M., & Okai, D. (2020). The spectrum of impulse control behaviors in Parkinson's disease: pathophysiology and management. *Journal of Neurology, Neurosurgery & Psychiatry*, 91(7), 703-711.
- 4-Rosqvist, K., Schrag, A., Odin, P., & CLaSP Consortium. (2022). Caregiver burden and quality of life in late stage Parkinson's disease. *Brain Sciences*, 12(1), 111.
- 5-Lindop, F., & Skelly, R. (Eds.). (2021). *Parkinson's Disease: An Interdisciplinary Guide to Management: Parkinson's Disease: An Interdisciplinary Guide to Management*. Elsevier Health Sciences.
- 6-Santos, P. C. R., Gobbi, L. T. B., Orcioli-Silva, D., Simieli, L., van Dieën, J. H., & Barbieri, F. A. (2016). Effects of leg muscle fatigue on gait in patients with Parkinson's disease and controls with high and low levels of daily physical activity. *Gait & posture*, 47, 86-91.

- 7-Park, J., Tolea, M. I., Arcay, V., Lopes, Y., & Galvin, J. E. (2019). Self-efficacy and social support for the psychological well-being of family caregivers of care recipients with dementia with Lewy bodies, Parkinson's disease dementia, or Alzheimer's disease. *Social Work in Mental Health, 17*(3), 253-278.
- 8-Golińska, P. B., Bieleninik, Ł., Harciarek, M., & Bidzan, M. (2022). The impact of cognitive impairment of individuals with Parkinson's disease on their caregivers' mental health: A systematic review protocol. *PLoS One, 17*(7), e0271480.
- 9-Shin, J. Y., & Habermann, B. (2022). Nursing research in caregivers of people with Parkinson's disease from 2011 to 2021: A scoping review. *Applied Nursing Research, 66*, 151590.
- 10-Cotton, P., and Heisters, D. (2022): How to care for people with Parkinson's disease. *Nurs Times;108*(16):12–3.
- 11-Khedr, E.M.(2023): Prevalence of Parkinson's disease in Egypt: A review of the community-based survey, *Journal of Alzheimer's Disease & Parkinsonism*, ISSN: 2161-0460
- 12- Owen CL, Gaulton C, Roberts HC, Dennison L(2022). Perceptions of people with Parkinson's and their caregivers of falling and falls-related healthcare services- a qualitative study. *PLoS One. Oct 26;17*(10):e0276588. doi: 10.1371/journal.pone.0276588. PMID: 36288338; PMCID: PMC9604942.
- 13- Santos-García, D., de Deus Fonticoba, T., Cores Bartolome, C., Íñiguez Alvarado, M. C., Feal Panceiras, M. J., Suarez Castro, E., ... & COPPADIS Study Group. (2022). Predictors of the change in burden, strain, mood, and quality of life among caregivers of Parkinson's disease patients. *International Journal of Geriatric Psychiatry, 37*(6).
- 14- Huang TT, Hsu HY, Wang BH, Chen KH (2011). Quality of life in Parkinson's disease patients: validation of the Short-Form Eight-item Parkinson's Disease Questionnaire (PDQ-8) in Taiwan. *Qual Life Res. May;20*(4):499-505.
- 15- Goetz, C. G., & the Movement Disorder Society Task Force on Rating Scales for Parkinson's Disease (2008). Movement Disorder Society-sponsored revision of the Unified Parkinson's Disease Rating Scale: Scale presentation and clinometric testing results. *Movement Disorders, 22*, 2129–2170.
- 16- Steffen, A. M., Gallagher-Thompson, D., Arenella, K. M., Au, A., Cheng, S. T., Crespo, M., & Romero-Moreno, R. (2019). Validating the revised scale for caregiving self-efficacy: a cross-national review. *The Gerontologist, 59*(4), e325-e342.
- 17-Glozman JM, Bicheva KG, Fedorova NV (1998). Scale of quality of life of caregivers (SQLC). *J Neurol; 245* (Suppl 1):39–41
- 18- McCubbin, M.A. McCubbin, J.M. Patterson, A.E. Cauble, L.R. Wilson, W. Warwick (1983). CHIP—Coping health inventory for parents: an assessment of parental coping patterns in the care of the chronically ill child. *Journal of Marriage and the Family, 45* (2), pp. 359-370

- 19- Salkind, N. (2015). Encyclopedia of Measurement and Statistics 1st Edition. SAGE.
- 20- Ledda, C., Montanaro, E., Imbalzano, G., Merola, A., Bruno, I., Artusi, C. A., ... & Romagnolo, A. (2022). The burden of caregiving for cardiovascular dysautonomia in Parkinson's disease. *Clinical Autonomic Research*, 32(6), 455-461.
- 21- Yang, Z., Tian, Y., Fan, Y., Liu, L., Luo, Y., Zhou, L., & Yu, H. (2019). The mediating roles of caregiver social support and self-efficacy on caregiver burden in Parkinson's disease. *Journal of Affective Disorders*, 256, 302-308.
- 22- <https://www.apdaparkinson.org/community/2023>.
- 23- Duits, A. A., Boots, L. M., Mulders, A. E., Moonen, A. J., & Vugt, M. E. (2021). Covid Proof Self-Management Training for Caregivers of Patients with Parkinson's Disease. *Movement Disorders*, 36(3), 529.
- 24- Wallace, S. J., Kothari, J., Jayasekera, A., Tointon, J., Baiyewun, T., & Shrubsole, K. (2021). Do caregivers who connect online have better outcomes? A systematic review of online peer-support interventions for caregivers of people with stroke, dementia, traumatic brain injury, Parkinson's disease, and multiple sclerosis. *Brain Impairment*, 22(3), 233-259.
- 25- Fleisher, J., Hess, S., Klostermann, E., Lee, J., Mitchem, D., Levin, M., ... & Chodosh, J. (2021). Feasibility and Outcomes of Caregiver Peer Mentoring in Advanced Parkinson's Disease (2212).
- 26- Cheng, S. T., Chan, W. C., Fung, H. H., & Lam, L. C. (2022). Self-efficacy in controlling upsetting thoughts, but not positive gains, mediates the effects of benefit-finding group intervention for Alzheimer's family caregivers. *Psychology and Aging*, 37(6), 766.
- 27- Maoni, M.; Pierobon, A.; Frazzitta, G.; Callegari, S.; Giardini, A. (2019): Living with Parkinson's—Past, present and future: A qualitative study of the subjective perspective. *Br. J. Nurs.*, 28, 764–771. [CrossRef]
- 28- Baertschi, M.; Favez, N.; Flores Alves Dos Santos, J.; Radomska, M.; Herrmann, F.; Burkhard, P.R.; Canuto, A.; Weber, K.; Ghisletta, P. (2020): Illness Representations and Coping Strategies in Patients Treated with Deep Brain Stimulation for Parkinson's Disease. *J. Clin. Med.*, 9, 1186. [CrossRef]
- 29- Reich, S.G.; Savitt, J.M. Parkinson's Disease. *Med. Clin. N. Am.* (2019): 103, 337–350. [CrossRef]