

## Effect of Educational Video on Family Caregiver's Burden and Health Status of Elderly Patients with Parkinson's disease

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### Abstract

**Background:** Parkinson's disease is a neurodegenerative disorder that primarily affects the elderly population. Managing the care of individuals with Parkinson can be challenging for caregivers, leading to increased caregiving burden and potential negative impacts on elderly' health status. **Aim:** Determine the effect of educational video on family caregiver's burden and health status of elderly patients with Parkinson's disease. **Design:** A Quasi- Experimental design (one group pre/post design). The study was done in the neurological outpatient clinic at Mansoura University Hospital and Mansoura new General hospital **Subjects:** The study included 56 elderly patients with Parkinson's disease and their family caregivers as a convenience sample **Tools:** Data was collected using five tools; Demographic and clinical data structured interview schedule, Family caregiver's knowledge structured interview schedule, Zarit Burden Interview, Self-Reported Health status, Parkinson's Disease Questionnaire and Educational Video Evaluation Checklist. **Results:** A highly statistically significant differences were found in family caregiver's knowledge and burden and elderly patient's health status pre, post and follow up phase ( $P = <0.001$ ) for all. Also, a strong negative correlation was found between caregivers' burden and elderly health status. Moreover, 92.9% of the studied caregivers agree that the overall educational video was satisfied. **Conclusion:** The educational video had positive effects on increasing family caregivers' knowledge and reducing caregiving burden which leads to improvement in health status of elderly patients with Parkinson disease. **Recommendations:** The Parkinson's disease educational video should be accessible at the neurology outpatient clinic and department as a component of the health education process.

**Keywords:** Parkinson's disease; Family Caregiver's Burden; Health Status; Educational Video; elderly patients

### Introduction

Worldwide, neurodegenerative diseases portray one of the most important challenges. One of these with the fastest increasing prevalence, disability, and fatality rates is Parkinson's disease (*Virameteekul, Phokaewvarangkul, & Bhidayasiri, 2021*). Parkinson's disease (PD) is a long-term, age-related

neurodegenerative condition that primarily affects seniors. After Alzheimer's disease, it is the second most prevalent neurodegenerative condition (*Mouchaileh, & Hughes, 2020*).

Worldwide, one in six people suffer from a neurological disorder of some type (*Feigin, et al., 2019*). In the past 25 years,

the prevalence of PD has doubled; estimates from 2019 indicated that there were over 8.5 million person suffered from PD worldwide (*World Health Organization, 2022*). PD is uncommon in young people while in the elderly, the prevalence can reach up to 4% (*Zhao et al., 2021*). With an incidence of 82–62 per 100,000 individuals, it was discovered that the crude prevalence rate of PD in Egypt ranged from 213 to 557 per 100,000 persons. Men are 1.5 times more likely than women to have PD. (*El-Tallawy, 2013*). Over the age of 60, PD affects 1-2% of the population in Egypt, with a substantially lower incidence in younger people (*Khedr et al., 2015*)

Parkinson's disease is caused by genetic age-related alterations in the substantia nigra brought on produced by a buildup of mitochondrial DNA mutations together with neuronal functional impairment. Reduced dopamine production as a result causes tremors, stiffness, bradykinesia, and postural instability in motor function (*Rango, & Bresolin, 2018*). Additionally, PD is linked to a number of non-motor symptoms such depression, cognitive decline, exhaustion, and sleep disturbance, all of which have a detrimental impact on patients' general health state (*Zhao et al., 2021*). Parkinson's disease is a debilitating and progressing ailment that affects both the lives of the affected person and their family (*Radder et al., 2019*).

The core of long-term care for people with physical and mental disease, disabilities, and frailty due to aging is provided by family caregivers (FCGs) around the world. The majority of healthcare providers do not meaningfully involve FCGs as partners in care; FCGs offer 70–90% of the care to people in community homes who need care,

with 10%–30% of the care provided in congregate living. According to recent research recommendation, the healthcare workforce should get competency-based training to help them identify, evaluate, support, and collaborate with FCGs throughout the care trajectory (*Parmar, et al., 2022*).

The majority of care for elderly patients with PD is provided by family caregivers. In addition to providing patients with physical and emotional support, their caregiving has a significant financial impact and can delay the need for nursing home placement. Because of the time commitment required for this care, PD caregivers may not be able to spend as much time with friends and family. This can lead to social isolation, a decline in quality of life and mental health, poor sleep, and adverse psychological effects like anxiety and depression (*Villaseñor et al., 2020; Perrin et al., 2019*). As the PD progresses, caregiving might occasionally be seen as the major responsibility of some family members, which can put a significant load on primary caregivers. The term "caregiver burden" describes the unfavorable socioeconomic, psychological, and physical effects of caring for a person who has a disability. Understanding the extension of caregiver-burden and factors linked to higher caregiver-burden and distress is crucial to support caregivers in this role (*Carrilho et al., 2018 ; Tan, Williams, Tan, Clark, & Morris, 2020*).

Most of the care provided for older individuals with PD is by family members who lack any formal training in the field. Caregiver burden is more likely to affect the untrained FCGs. Numerous caregiver training programs are necessary to reduce caregiver burden, including disease

education and emotional support programs (Lee, Kim, Kim, Kim, & Sohn, 2019). Caregivers who receive little or no help from health professionals for their own condition in turn become "hidden patients" themselves. Additionally, a lack of general knowledge may hinder communication between the patient, caregiver, and doctor, which in turn has a detrimental impact on both the patient's ability to get treatment for the disease and carry out daily tasks. Educational programs might be helpful in spreading knowledge to the caregivers of elderly patients with PD, reduce burden and improve quality of life (Gultekin, Sarilar, Ekinci, Erturk & Mirza, 2017; Baby, Chacko, Seetharaman & Patil, 2021). Nurses should evaluate the educational needs of those who care for older patients with PD and create a unique intervention program (Lee et al., 2019).

Several technical and scientific developments have been implemented into nursing practice as teaching tools in the field of health education. One of these educational technologies is the educational video, which has been used in research with elderly patients and their caregivers to enhance a variety of outcomes. Using a video as a teaching tool allows for the standardization of instructions and the simultaneous transmission of information to a larger audience. It can provide visual information and clarify complicated emotional and medical issues (Sá et al., 2022). Video education is particularly interesting because it can reduce communication barriers, requires fewer resources than written materials or classroom lectures, and effective with people from different cultural backgrounds and with low health literacy levels (Denny,

Vahidy, Vu, Sharrief & Savitz, 2017; Quintiliani, et al., 2018).

Until this date, we noticed that, there is few known information about the situation of FCGs of elderly patients with PD in Egypt and the degree of burden they are experienced and its effect on patient's health status. In response, we initiated our study to determine the effect of educational video on caregiver's burden and health status of elderly patients with Parkinson's disease

### **Significance of the study**

Elderly patients with PD have many changes that impact every aspect of their lives. Elderly PD patients are rapidly becoming disabled and will eventually require assistance with nearly daily activities (Rocca, 2018). With disease progression, elderly patients depend increasingly on others to take care of them. Parkinson's disease patients often require physically, emotionally, and psychologically exhausting caregiving, which increases the burden on family caregivers. Management of caregiving burden in PD is important as family caregivers significantly contribute to the well-being of elderly patient with PD, while suffering from personal, financial, and social losses (Martinez - Martin et al., 2022). Burnout and early institutionalization of the elderly patient with PD may result from failing to detect and manage caregiving burden (Flesch., Batistoni., Neri. and Cachioni., 2019). Moreover, caregiving responsibilities can impact the health status of both the patients and their caregivers. Therefore, it is crucial to explore interventions that can alleviate family caregiving burden and improve the health outcomes of elderly patients with PD.

## Research aim

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Determine the effect of educational video on family caregiver's burden and health status of elderly patients with Parkinson's disease.

## Research hypothesis

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The implementation of the educational videos will have a positive effect in reducing caregiving burden and improving health status of elderly patients with Parkinson's disease than pre the educational videos.

## Operational definitions

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**Educational Video:** referred to as seeing audiovisual recorded content (which illustrates, demonstrate or teach a subject via a video format) during a live session in which the video constituted an essential part of the educational content.

**Family Caregiver:** A person who, without formal training in home caregiving, offers unpaid, continuous, and long-term assistance in activities of daily living or instrumental activities for an elderly individual with a disease or disability in their home.

**Caregiving burden:** is a multidimensional response to the physical, psychological, mental, social, and economic stressors encountered with providing care. It is a complex process that impacts caregivers' life on a biological, psychological, and sociological level.

**Design:-** A Quasi- Experimental design (one group pre/post design) was used in this study.

**Setting :-** This study was conducted at the neurological outpatient clinics at

Mansoura University Hospital's Medical Centers, specifically the movement disorders outpatient clinic (located on the first floor and consisting of four outpatient clinics that operated every Wednesday) and the neurological outpatient clinics at Mansoura New General Hospital (operating every Monday). Each week, each clinic receive about 6–8 patients for the purpose of treating and monitoring PD patients of all type who live in various districts throughout the city who are accompanied by their caregivers for care, support, and safety.

**Subjects:-** A convenience sample of 56 elderly patients and their family caregivers' dyad attending the previous settings and meeting the following criteria:-

- **For elderly patients:** Parkinson's disease diagnosis for more than six months, Ability to communicate, willingness to engage, availability during the data collection time and not suffer from cardiovascular disease or severe organ failure (heart, lung or liver).
- **For family caregivers:** Being 18 years or older, both sexes, in the role of providing direct care for elderly patients, with a level of education above elementary school, not enrolled in any other studies of a similar nature, having access to a laptop, tablet, or mobile phone with them or a close relative to watch the educational video, and ready to engage in in the study.

**Sample size:** The sample size was calculated using G\* Power software for Windows (version 3.1.9.2) using the finding of a previous related study (*Sook , Woo, and Sang-Myung ., 2017*) that demonstrated a difference

in care burden among caregivers of people with Parkinson's disease (mean± SD of caregiver burden before intervention 58.63±13.22 and Post1 from intervention 45.42±15.80 respectively) . At Power (1-β error probability) = 0.95 and α error probability = 0.05. The sample size required was 51caregivers. By adding 10% due to the drop, final sample size became 56 elderly patients with PD and their family caregivers.

**Tools:** In this study five tools were used;

**Tool I: Demographic and clinical data structured interview schedule:** After reviewing the relevant literature, this tool was developed by the researchers which include:

**Part I: Data about elderly patients with Parkinson's disease:** Included the following items:

1. **Demographic characteristics** included age, sex, social status, educational level, residence and income of the elderly patients.
2. **Health history of elderly patients** as duration PD, motor & non motor symptoms, medication taken, side effect of medication and, presence of comorbidity.
3. **Compliance with medication:** patient was considered complaint when the patient consumed 80% or more of all the doses of the prescribed medication in the previous week (**Lam & Fresco, 2015**).
4. **Hoehn and Yahr Staging Scale (Hoehn and Yahr., 1967)** to measure Parkinson disease's symptoms severity through observing patient in both sitting and standing position. It included stages 1 to 5 as the following: -
  - Stage1: Unilateral involvement, usually with little or no functional disability.

- Stage 2: Bilateral or midline involvement without impairment of balance
- Stage 3: Bilateral disease means mild to moderate disability with impaired postural reflexes; physically independent.
- Stage 4: Severely disabling disease; still able to walk or stand unassisted.
- Stage 5: Confinement to bed or wheelchair without assistance.

**Part two: Data about Caregiver:** It was included the following items:

1. Demographic characteristics such as age, sex, marital status, level of education, occupation and income.
2. Health related data such as presence of chronic diseases and medication taken.
3. Caregiving properties include degree of relationship, living with elderly patient, duration of care and daily time of care.

**Tool II: Family Caregiver's Knowledge Structured Interview Schedule:** - The researchers developed this tool after reviewing the relevant literature (*Ali., 2015; Boyactioğlu & Kutlu, 2017; Perez et al., 2022 and Yan Choo et al., 2020*) to assess knowledge of caregiver about Parkinson's disease It was consisted of nineteen (19) multiple choice questions (MCQ) and twenty three (23) true & false questions including two parts:-

**Part 1:- Family caregiver's knowledge about Parkinson's disease:** - Included questions about definition of PD, risk factors, signs and symptoms, diagnosis, management, complications and how to deal with elderly Parkinson's disease patients.

**Part 2:- Family caregiver's knowledge about caregiving burden and how to overcome it?** It Included questions

related to caregiving burden, risk factors of caregiving burden, signs of caregiving burden, stages of caregiving burden and overcoming caregiving burden.

**Scoring system for family caregiver's knowledge structured interview schedule:-** Each question's correct answer receives one (1) grade, while the incorrect answer receives zero (0). A total of seventy (70) grades were used to calculate the total knowledge score then converted into percent as follow

**The total knowledge score (Hussein & Shehata., 2016):-**

- Satisfactory level of knowledge = More than 35 grades = Equal or more than 50%
- Unsatisfactory level of knowledge = Less than 35 grades = less than 50%

**Tool III: Zarit Burden Interview (ZBI):** Developed by *Zarit, Reever, & Bach-Peterson, (1980)* and used for caregiving burden assessment. Reliability of the Arabic version was assured by spearman's correlation coefficient ( $r=0.85$ ) by *Sherif, Shams, Abd-Elhameed, & Ali, (2014)*. It composed of 22 statements rating scale for assessing caregiving burden in health, financial, social aspects, psychological well-being and relationship with patient. **Scoring system:** By using a 5-point Likert scale in each statement, the response range from zero (never) to 4 (nearly always). The grade of statements was summed to calculate the total score where a higher scores indicating higher caregiving burden as the following:

- "Little or no burden" from zero to 20.
- "Mild to moderate burden" from 21 to 40.
- "Moderate to severe burden" from 41 to 60.
- "Severe burden" from 61 to 88.

**Tool IV: Health status of the elderly patients with PD was assessed through:**

1. **Self-Reported Health status (SRH);** assessed by a single-item self-report question: "How do you rate your health?" A 5-point scale was used to rate responses as (1) excellent, (2) very good, (3) good, (4) fair, and (5) poor. The responses were then classified into a categorical dimension;
  - Good health (excellent /very good/good) referred to optimal health state, coded as 0,
  - Poor health (fair/ poor) as less than optimal health, coded as 1 (*Makhlouf, 2007; and Fonta, Nonvignon, Aikins, Nwosu, & Aryeetey, 2017*).
2. **Parkinson's Disease Questionnaire (PDQ-39):** Developed by *Jenkinson et al., (1997)* and considered the commonly used indicator of health status in patients with PD (*Kudlicka, Clare, & Hindle, 2014*). Reliability of Arabic version ( $r=0.87$ ) was assured by *Mohammed, Elmawla, Hassan, & Elhameed, (2020)*. PDQ consisted of 39 self-report items with 8 dimensions (10 items mobility, 6 items activity of daily living, 6 items emotional wellbeing, 4 items stigma, 3 items social support, 4 items cognitive impairments, 3 items communication and 3 items bodily impairment). **Scoring system:** responses was indicated using a 5-point Likert scale from zero (never) to 4 (always). The score of each dimension was estimated by summing the included items in the dimension then dividing by the maximum possible score and the result was multiplied by 100. A total score was calculated as a mean score of the 8 dimensions where a lower score reflect better health status.

### Tool V: Educational Video Evaluation

**Checklist:** Caregivers were given an assessment checklist to complete in order to rate the program and educational video after their participation. It was adapted by the researchers from a previously developed evaluation tool in the related relevant literature (Natarajan et al., 2022 & A'campo, Spliethoff-Kamminga, Macht, EduPark Consortium, & Roos, 2010). It included 11 items with a 3-point scale (agree, agree somewhat and disagree).

### Method

#### Preparatory phase

- **Administrative phase:** An official approval was taken from the responsible authorities in faculty of nursing Mansoura University to the head of the neurological outpatient clinics at Mansoura University Hospital's Medical Centers and of Mansoura New General Hospital to gain insight into the study aim and data collection time in order to get the permission allowing the researchers to conduct the study
- After extensive review of the related literatures, the researchers developed Tool I (Demographic and clinical data structured interview schedule), Tool II (Caregiver's knowledge structured interview schedule) and Tool V (Educational Video Evaluation Checklist).
- The Arabic version of tool III (ZBI), tool IV (PDQ-39) were used in data collection.
- **The educational videos** included knowledge and activities to reduce caregiving burden and improve health status of elderly patients with

Parkinson's disease. The scripts for the videos were developed based on related literature (Golińska et al., 2017; Bagheri et al., 2019; Hellqvist et al., 2020; Wichmann & Parashos, 2020; Lubomski et al., 2021) in simple Arabic language with colored pictures and reviewed by five experts in the field of Gerontological nursing and Geriatric medicine. The script of the educational video was divided in six videos (sessions).

- **Content Validity:** Five (5) specialists in the fields of geriatric medicine and gerontological nursing served as a jury to evaluate the study tools' feasibility and content validity, and any modifications required were made as a result. Every specialist rated the relevance of each item of tool II and (Family caregiver's knowledge structured interview schedule), and tool V (Educational Video Evaluation Checklist) using the following rating system: (1) not relevant, (2) somewhat relevant (3) quite relevant, and (4) highly relevant. The item – Content Validity Index (I-CVIs) was 0.85–1.0 and a total scale-CVI (S-CVI) was 0.95 based on ratings received from specialists
- The final versions of the educational videos were shared with the jury members to ensure video's accuracy and quality, before being made available to the caregivers involved in the study.
- **Face validity:** To evaluate the study tools and educational videos' applicability and clarity, a pilot study was carried out on 10% (6) of elderly patients and their family caregivers at study settings before data collection process began and the necessary modifications were then made. The

study sample was not comprised of these patients or their caregivers.

• **Reliability of the tools:** The tool's internal consistency was evaluated by the researchers using reliability. The reliability of tool II (Family caregiver's knowledge structured interview schedule), and tool V (Educational Video Evaluation Checklist) using test – retest method. These tools were applied to 6 of elderly patients and their family caregivers selected from study settings and given after two weeks again. By using the Spearman's correlation coefficient  $r$ , the reliability was  $(r) = 0.85$ ,  $(r) = 0.87$  respectively.

• **Ethical considerations:** The Mansoura University Faculty of Nursing's Research Scientific Ethical Committee gave its approval. After being informed of the study's objectives, each participant provided written consent to participate in the research. The participants' privacy was guaranteed, and the obtained data's confidentiality was preserved. Participants in the study were made aware of their freedom to leave at any time without penalty.

**Field work:** The program was performed in four phases (assessment, planning, implementation and, evaluation).

### **I- Assessment phase**

- In accordance with the neurological outpatient clinics at Mansoura University Hospital's Medical Centers' schedule, the researchers visited the clinics every Wednesday and every Monday for the neurological outpatient clinics at Mansoura new General hospital.
- The researchers introduced themselves to the elderly patient and family

caregiver at the beginning and then gave them a brief explanation of the study's purpose.

- The researchers conducted individual interviews with each study participant in the outpatient clinic waiting areas.
- For both the researchers and the elderly participants who were interviewed as well as their caregivers who were part of the study, the infection control precautionary practices were implemented as maintaining physical distance, putting facemasks and gloves, and using aseptic alcohol solution.
- After informing the participants of the study's purpose, written informed consent was obtained. The required information was then gathered using the study tools. To complete the patient's health history part, medical records were checked. The elderly patient and the family caregiver answered the remaining questions.
- Assessment of each elderly patient was done using tool I (part I: Data about elderly patients with PD) and Tool IV (Health status of the elderly patients with PD), while family caregiver was done using tool I (part II: Data about caregiver), tool II (Caregiver's knowledge structured interview schedule) and tool III (ZBI) (pre-test). The study tools took between 30 and 40 minutes to be completed. In order to maintain contact with the study participants, the researchers took their phone numbers.
- While family caregivers completed the questionnaire on their own, the researchers entailed reading each item to the elderly patient and mark exactly their response.

### **II- Planning phase**



- The development of the educational video occurred in three phases: pre-production, production and post-production. In the pre-production phase, the script was developed based on related literature in simple Arabic language with colored pictures and the reviewed by five experts in the field of Gerontological nursing and Geriatric medicine. The script of the educational videos was divided into six videos (sessions).
- In the next phase, the videos were recorded according to the script; at this stage, one of the researchers developed each part of the video according to the scripts. At the last phase, post-production, where added researchers sound on it then converting into video using video making program.
- **General objective of the educational video** was to reduce caregivers' burden and improve health status of elderly patients with Parkinson's disease.
- **Educational video contents:** The content of the educational video was designed to meet caregiver's needs and to fit into their interest and level of understanding. During each session one main key component (topic) of the educational program is discussed. Session content is adapted to suit the needs of either the PD participants or the caregiver participants. The links and duration of video parts are shown in *Table 1*
- The educational video's content was created to accommodate needs as well as the interest and understanding levels of either participants with PD or those who are caregivers. At each session, one main important topic of the instructional program is covered in detail. The session's material is modified to meet the needs of either participants with PD or those who are caregivers.

Video Parts	Videos duration	Links
<b>Part 1</b> Introduction about PD	7 minutes & 47 seconds	<a href="https://drive.google.com/file/d/1mXFddk2AJ88F306Kq4BRhMDQfi068hOm/view?usp=sharing">https://drive.google.com/file/d/1mXFddk2AJ88F306Kq4BRhMDQfi068hOm/view?usp=sharing</a>
<b>Part 2</b> Diagnosis & clinical manifestations of PD	14minutes & 6seconds	<a href="https://drive.google.com/file/d/1VmO5icFsYWMedXtbU1XFROaqsrhGAqif/view?usp=sharing">https://drive.google.com/file/d/1VmO5icFsYWMedXtbU1XFROaqsrhGAqif/view?usp=sharing</a>
<b>Part 3</b> Management of PD	18 minutes & 13seconds	<a href="https://drive.google.com/file/d/1KbA1USrg41s8VSBjyZLd_E4bpzs1icCO/view?usp=sharing">https://drive.google.com/file/d/1KbA1USrg41s8VSBjyZLd_E4bpzs1icCO/view?usp=sharing</a>
<b>Part 4</b> Dealing with elderly patients with PD	8 minutes & 49 seconds	<a href="https://drive.google.com/file/d/1msF1jOKKOT9GjDg83Exoble1h7WRlnr/view?usp=sharing">https://drive.google.com/file/d/1msF1jOKKOT9GjDg83Exoble1h7WRlnr/view?usp=sharing</a>
<b>Part 5</b> Caregiver's burden	7 minutes & 9 seconds	<a href="https://drive.google.com/file/d/1JRHKIDq_4bJk118jcRvKSQPvTLrYOPd7/view?usp=sharing">https://drive.google.com/file/d/1JRHKIDq_4bJk118jcRvKSQPvTLrYOPd7/view?usp=sharing</a>
<b>Part 6</b> Overcoming caregiver's burden	8 minutes & 26 seconds	<a href="https://drive.google.com/file/d/1H6MIOegYKfmNGkzr3GYOrmuKvyAUN9sx/view?usp=sharing">https://drive.google.com/file/d/1H6MIOegYKfmNGkzr3GYOrmuKvyAUN9sx/view?usp=sharing</a>
<b>Overall educational video time 64 minutes 30 seconds</b>		

*Table (1): The links and duration of video parts*

### III- Implementation phase

- The developed educational video for the family caregivers was conducted individually in neurological outpatient clinics at Mansoura University and Mansoura New General Hospital. At the start of the first session; the researcher introduced themselves, explained the sessions' objectives.

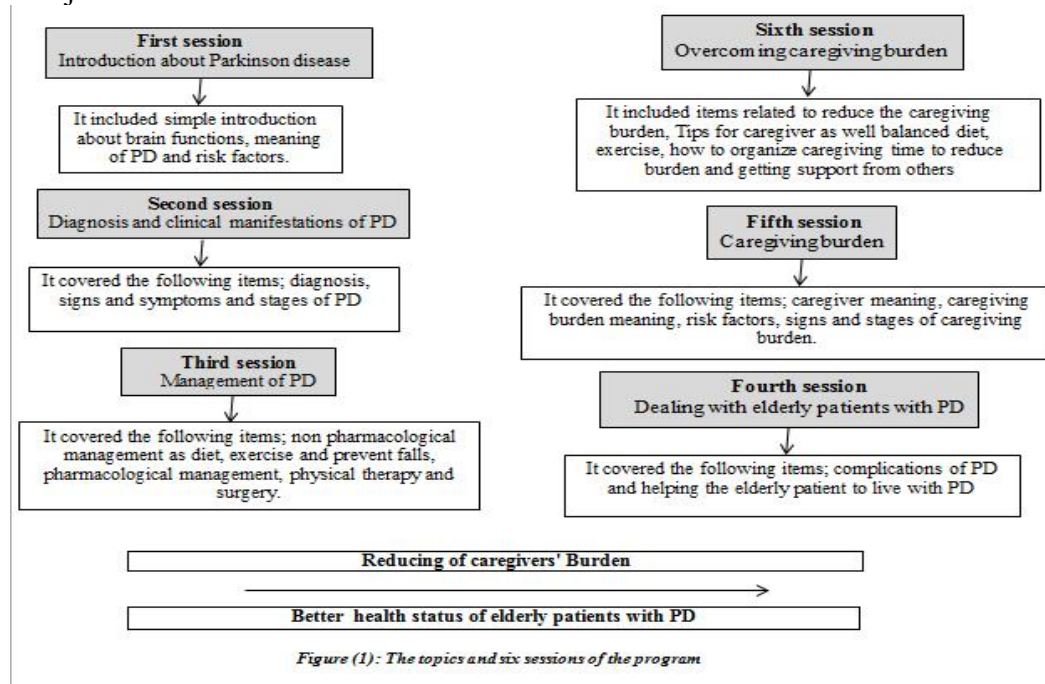


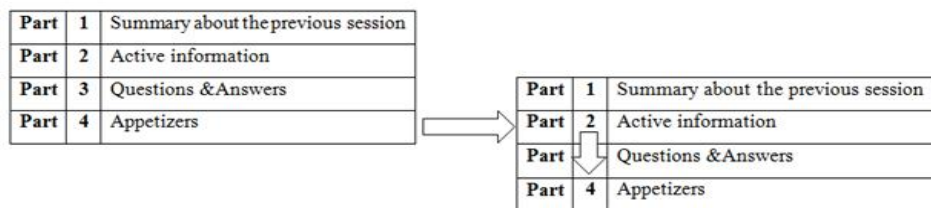
Figure (1): The topics and six sessions of the program

- Video instructions incorporate elements of multimedia instruction by displaying more visual information than a static image or images and the potential for auditory information.
- Throughout the sessions, the researchers utilized simple, clear and brief words. The educational video was used to clarify information for each participant in the study. The researchers using their personal laptop. Each session concluded

- Educational program was divided into 6 sessions. Each session's duration last from 30 to 45 minutes for six weeks, held one day a week. The maximum viewing time for each of the 6 videos was about 19 minutes. The content of sessions are shown in *Figure (1)*

with a brief overview from the researchers outlining the key points, followed by the distribution of meeting pamphlets to the samples.

- Before beginning the subsequent sessions, the researcher used to ask questions related to topic that was discussed in the previous session in order to clarify any missed or unclear topics any defects were reemphasized by the researchers.



**Figure (2): The structure of the sessions**

*The summary about the previous session is always done first in the next session and the arrows indicates that the appetizer returns in the active information part of the next session*

- In order to give older patients the assistance and information they need and to ensure that they understand their disease, the researchers presented the component of sessions to patient-caregiver dyad (in the presence of the elderly patient).
- The educational video was given to caregivers on CD or sending by Phone Bluetooth or through whatsapp application according to caregiver available resources for caregivers' collaboration, motivation and enable home practice and review.
- Every researcher provided their contact information so that participants may ask questions or share any concerns or beliefs regarding the study. Also, the researchers were did a telephone call two time per week for caregivers to answer any questions and provide positive feedback and encouragement.
- Data collection done through a period of 9 months that started from the beginning of February, 2021 to the end of October, 2021. Schedule days of data collection start from 9 am - 1pm.

#### **IV- Evaluation phase**

One month (Post) and three months (follow up) after implementation of the educational video (*Shadizad, Rahmati, & Petramfar 2018*), the study participants were evaluated to determine the effect of the educational video. For the family caregivers using tool II (Caregiver's knowledge structured interview schedule), tool III (ZBI) , while the studied elderly were evaluated-by using tool I – part I-3 (Compliance with medication), tool IV (Health status). At the end of the program; the family caregivers were asked to evaluate the program and educational video after participation using Tool V (Educational Video Evaluation Checklist).

#### **Statistical Analysis**

The statistical package for social science (SPSS) version 22 was used for analyzing the data. As relevant descriptive statistical tests, frequency, percentage, means, and standard deviation were used. In addition to using inferential statistics, paired sample t-tests were used to compare the means of two variables for a single group, and the McNemar test was used to examine the differences between dichotomous categorical

variables in paired groups. The correlation between the variables was examined using Pearson's correlation coefficient. Results are interpreted significant when the probability of error is smaller than ( $P < 0.05$ ).

## Results

According to Table 1, the age of the elderly patients with PD in the study was between 60 to 90 years, with a mean age of  $68.18 \pm 8.44$  years. 58.9% of them were males, 62.5% were married, 71.4% were illiterate, and 55.4% were working before retirement, 87.5% were living in rural areas, and 80.4% of them their income was insufficient and 83.9% stated they lived with their families.

**Table 2** demonstrates that, 48.2% of the studied elderly patients had PD since less than five years. 46.4% were in the stage 1 of PD (unilateral stage), tremor was the most common motor symptoms reported by 92.9% while apathy was the most reported non motor symptoms (62.5%). Levodopa 64.3% was the most common medication used and 91.1% suffered from medications' side effects. Moreover, 57.1% suffered from comorbidity.

**For, table 4** the studied caregivers ranged in age from 25 to 55 years with a mean age of  $42.64 \pm 12.88$  years. Female caregivers constituted 69.6%, 82.1% were married, 48.2% had secondary education, and 87.5% was not work. Also, 73.2% of them did not have any disease or take medication and

80.4% report that their medical health did not hinder caring the elderly patients.

**Table 4** shows that 42.8% of the studied caregivers were elderly' son or daughter, 78.6% were living with the elderly patient, 64.3% of them had secondary caregiver, 55.4% spend more than 9 hours in caregiving daily and 48.2% were caring elderly patient for less than 5 years,. Moreover, 94.6% of studied caregivers didn't receive previous courses on caring the elderly.

**Figure 1** shows that knowledge level of the studied caregivers increased significantly post educational video ( $P1 = < 0.001$ ), and the improvement was slightly decreased in knowledge level in the follow up but remain differ significantly in comparison to pre educational video ( $P2 = < 0.001$ ).

**Table 5** shows significant reduction (improvement) in the total mean score and level of caregiver burden of the studied caregivers post educational video ( $P^1 = < 0.001$ ), and the improvement was slightly increased in the follow up and remain differ significantly in comparison to pre educational video ( $P^2 = < 0.001$ ).

**Figure 2** illustrates that, 36.8% of the studied elderly patients reported their health status as good pre educational video which increased to 43.4% and 51.3% post educational video and in follow up respectively with statistical significant difference ( $P^1 = < 0.001$  &  $P^2 = < 0.001$ ).

**Table 6** reveals that, total mean scores of all dimensions of health status (PDQ-39); mobility, activity of daily living, emotional wellbeing, stigma, social support, cognitive impairments, communication and bodily impairment were decreased (improved) significantly in the studied elderly patients post educational video ( $P^1 = <0.001$  for all except cognitive impairment  $P^1 = 0.033$ ) and the improvement maintained at follow up evaluation ( $P^2 = <0.001$  for all except cognitive impairment  $P^1 = 0.005$ ).

**Figure 3** illustrates that, 50% of the studied elderly patients were compliant with their medication pre educational video which increased to 64.5% and 75% post educational video and in follow up respectively with statistical significant difference ( $P1 = <0.001$  &  $P2 = <0.001$ ).

**Table 7** clarifies that, caregivers total knowledge score and elderly patients' health status (PDQ-39) and self-reported health pre, post educational video and in follow up there had a significant negative correlation i.e increasing caregiver's knowledge was

associated with improving elderly patient' health status. Also, there was a highly statistical negative correlation between caregiver knowledge and caregiver burden pre, post educational video and in follow up.

**Figure 4, 5,6** demonstrates that, caregiver's burden and elderly patients' health status (PDQ-39) pre, post educational video and in follow up had a significant positive correlation ( $p < 0.0001$  for all) i.e increasing caregiver's burden was associated with poor elderly patient' health status.

**Table 8** shows that 92.9% of the studied caregivers agree that the program provided new information, the video recordings have been very crucial in increasing understanding, the video was easily controlled and the overall educational video and program was satisfied. On the other hand, only 1.8% of the studied caregivers disagree that their expectations was fulfilled and the information in the videos was very valuable.

**Table 1:** Demographic characteristics of the studied elderly patients with Parkinson disease

Demographic Characteristics	N= 56	100%
<b>Age</b>		
-60 years	43	76.8
-75 years	7	12.5
+85 years	6	10.7
<b>Mean ± SD (Min – Max)</b>	<b>68.18±8.44 (60-90 years)</b>	
<b>Sex</b>		
Male	33	58.9
Female	23	41.1
<b>Marital status</b>		
Married	35	62.5
Widow	21	37.5
<b>Educational level</b>		
Illiterate	40	71.4
Basic education	12	21.4
Secondary education	4	7.1
<b>Work before retirement</b>		
Work	31	55.4
Not work	25	44.6
<b>Residence</b>		
Rural	49	87.5
Urban	7	12.5
<b>Monthly family income</b>		
Not enough	45	80.4
Enough	11	19.6
<b>Living arrangements</b>		
With the family	47	83.9
With sons	9	16.1

**Table 2:** Medical history of the studied elderly patients with Parkinson disease

Medical History	N= 56	100%
<b>The disease's duration</b>		
Less than 5 years	27	48.2
5≤10 years	18	32.2
More than 10 years	11	19.6
<b>Hoehn and Yahr staging</b>		
Stage 1 : Only unilateral involvement, usually with minimal or no functional disability	26	46.4
Stage 2: Bilateral or midline involvement without balance impairment	8	14.3
Stage3:Bilateral disease: mild to moderate disability with impaired postural reflexes; physically independent	4	7.1
Stage4:Severely disabling disease; still able to walk or stand unassisted	13	23.2
Stage 5: Confinement to bed or wheelchair without assistance.	5	8.9
<i>Mean ± SD (Min – Max)</i>	<i>2.34±1.41 (1-5)</i>	
<b>Motor symptoms#</b>		
Tremors	52	92.9
Bradykinesia	44	78.6
Rigidity	26	46.4
Postural instability	15	26.8
<b>Non Motor symptoms #</b>		
Apathy	35	62.5
Sleep problems	33	58.9
Feeling depressed	28	50.0
Orthostatic hypotension	19	33.9
Dysphagia	12	21.2
Drooling of saliva	10	17.9
<b>Total number of symptoms</b>		
More than three symptoms	30	53.6
Three symptoms	21	37.5
Two symptoms	30	53.6
<b>Medication used for PD</b>		
Levodopa	36	64.3
Dopamine agonist	10	17.8
COMT inhibitor	5	8.9
MAO inhibitor	3	5.4
Amantadine	2	3.6
<b>Suffering from medication side effect</b>		
Yes	51	91.1
No	5	8.9
<b>Presence of comorbidity</b>		
Yes	32	57.1
No	24	42.9

**Table 3:** Demographic characteristics and health related data of the studied family caregivers

Item	N= 56	100%
<b>Age (years)</b>		
18-30	11	19.6
30-40	15	26.8
40-50	5	8.9
50 and more	25	44.6
<b>Mean ± SD (Min – Max)</b>	<b>42.64± 12.88 (20-55 years)</b>	
<b>Sex</b>		
Male	17	30.4
Female	39	69.6
<b>Marital status</b>		
Married	46	82.1
Unmarried	10	17.9
<b>Educational level</b>		
Basic education	20	35.7
Secondary education	27	48.2
Higher education	9	16.1
<b>Work</b>		
Work	7	12.5
Not work	49	87.5
<b>Suffering from diseases</b>		
No	41	73.2
One disease	11	19.6
Two diseases	2	3.6
More than three diseases	2	3.6
<b>Medication taken:</b>		
No	41	73.2
One medication	10	17.9
Two medications	3	5.4
More than three medications	2	3.6
<b>Does your medical health hinder caring the elderly</b>		
Yes	11	19.6
No	45	80.4



**Table (4):** Caregiving properties of the studied family caregivers

Item	N (56)	% 100
<b>Relation to elderly patients with PD</b>		
Son / daughter	24	42.8
Son's wife	17	30.4
Husband /wife	15	26.8
<b>Living with elderly patients with PD</b>		
Yes	44	78.6
No	12	21.4
<b>Availability of secondary caregiver</b>		
Yes	36	64.3
No	20	35.7
<b>Number of daily hours of caring</b>		
3>6hours	12	21.4
6>9hours	13	23.2
9 hours and more	31	55.4
<b>Period of caregiving</b>		
Less than 5 years	27	48.2
5≤10 years	17	30.4
More than 10 years	12	21.4
<b>Previous courses in elderly patients care</b>		
Yes	3	5.4
No	53	94.6

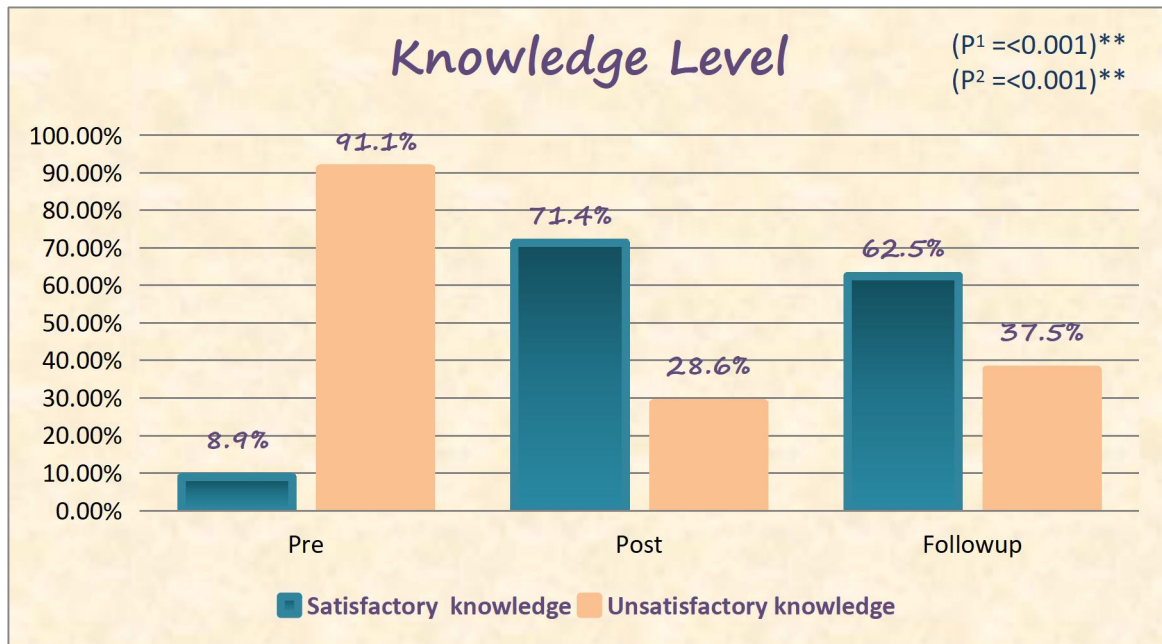


Figure (1): Effect of educational video on caregivers' knowledge level

Table (5): Effect of educational video on caregivers' burden

Caregivers' burden	Pre		Post		Follow up		Test of significance	
	N	%	N	%	N	%	P <sup>1</sup>	P <sup>2</sup>
Little or no burden	1	1.8	10	17.9	11	19.6		
Mild burden	26	46.4	35	62.5	35	62.5		
Moderate burden	25	44.6	11	19.6	10	17.9	t=16.126	t=17.376
Sever burden	4	7.1	0	0	0	0	(<0.0001) **	(<0.0001) **
<b>Total mean score</b>	41.71±11.5		33.71±10.82		32.07±10.35			
	6							

t-test with paired samples (p)<sup>1</sup>: comparing pre and 1 month after the program (post).

t-test with paired samples (p)<sup>2</sup>: comparing pre and 3 months after the program (follow up).

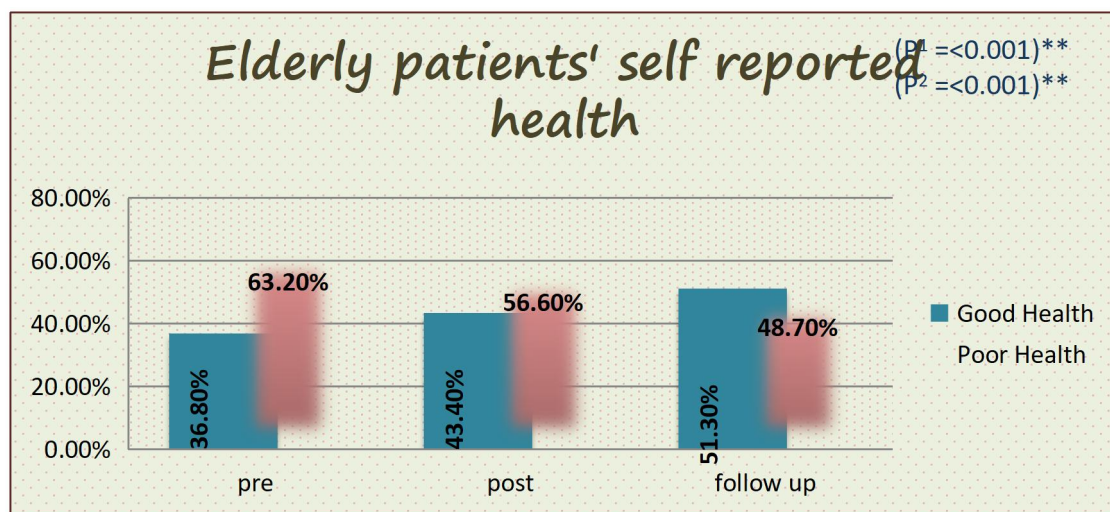


Figure (2): Effect of educational video on elderly patients' self-reported health

**Table (6):** Effect of educational video on elderly patients' health status (PDQ-39)

PDQ-39	Pre	Post1	Follow up
	Mean ± SD		
<b>Mobility</b>	67.5±22.97	66.71±22.9	63.38±22.79
<i>t</i> -test ( <i>p</i> ) <sup>1</sup>		t=12.133 (<0.0001) **	
<i>t</i> -test ( <i>p</i> ) <sup>2</sup>		t=18.651 (<0.0001) **	
<b>Activity of daily living</b>	66.01±18.36	65.53±18.21	62.41±17.94
<i>t</i> -test ( <i>p</i> ) <sup>1</sup>		t=1.307 (0.195)	
<i>t</i> -test ( <i>p</i> ) <sup>2</sup>		t=8.890 (<0.0001) **	
<b>Emotional wellbeing</b>	39.31±22.77	38.78±22.81	35.46±22.92
<i>t</i> -test ( <i>p</i> ) <sup>1</sup>		t=15.712 (<0.0001) **	
<i>t</i> -test ( <i>p</i> ) <sup>2</sup>		t=7.146 (<0.0001) **	
<b>Stigma</b>	45.56±23.02	44.26±22.74	41.45±22.99
<i>t</i> -test ( <i>p</i> ) <sup>1</sup>		t=11.091 (<0.0001) **	
<i>t</i> -test ( <i>p</i> ) <sup>2</sup>		t=19.438 (<0.0001) **	
<b>Social support</b>	24.97±15.89	18.36±17.56	11.25±18.76
<i>t</i> -test ( <i>p</i> ) <sup>1</sup>		t=12.424 (<0.0001) **	
<i>t</i> -test ( <i>p</i> ) <sup>2</sup>		t=20.027 (<0.0001) **	
<b>Cognitive impairments</b>	52.30±15.74	51.77±16.04	51.48±15.69
<i>t</i> -test ( <i>p</i> ) <sup>1</sup>		t= 2.178 (0.033)*	
<i>t</i> -test ( <i>p</i> ) <sup>2</sup>		t= 2.872 (0.005)**	
<b>Communication</b>	37.94±20.11	37.49±19.99	36.93±19.61
<i>t</i> -test ( <i>p</i> ) <sup>1</sup>		t=11.779 (<0.0001) **	
<i>t</i> -test ( <i>p</i> ) <sup>2</sup>		t=9.908 (<0.0001) **	
<b>Bodily discomfort</b>	38.27±19.96	37.79±19.76	36.57±19.55
<i>t</i> -test ( <i>p</i> ) <sup>1</sup>		t=10.198 (<0.0001) **	
<i>t</i> -test ( <i>p</i> ) <sup>2</sup>		t=15.268 (<0.0001) **	
<b>Total mean score</b>	<b>46.48±12.46</b>	<b>45.14±12.67</b>	<b>42.43±12.7</b>
<i>t</i> -test ( <i>p</i> ) <sup>1</sup>		t=15.310 (<0.0001) **	
<i>t</i> -test ( <i>p</i> ) <sup>2</sup>		t=28.505 (<0.0001) **	

*t*-test with paired samples (*p*)<sup>1</sup>: comparing pre and 1 month after the program (post).

*t*-test with paired samples (*p*)<sup>2</sup>: comparing pre and 3 months after the program (follow up).

Lower score indicate better health status.

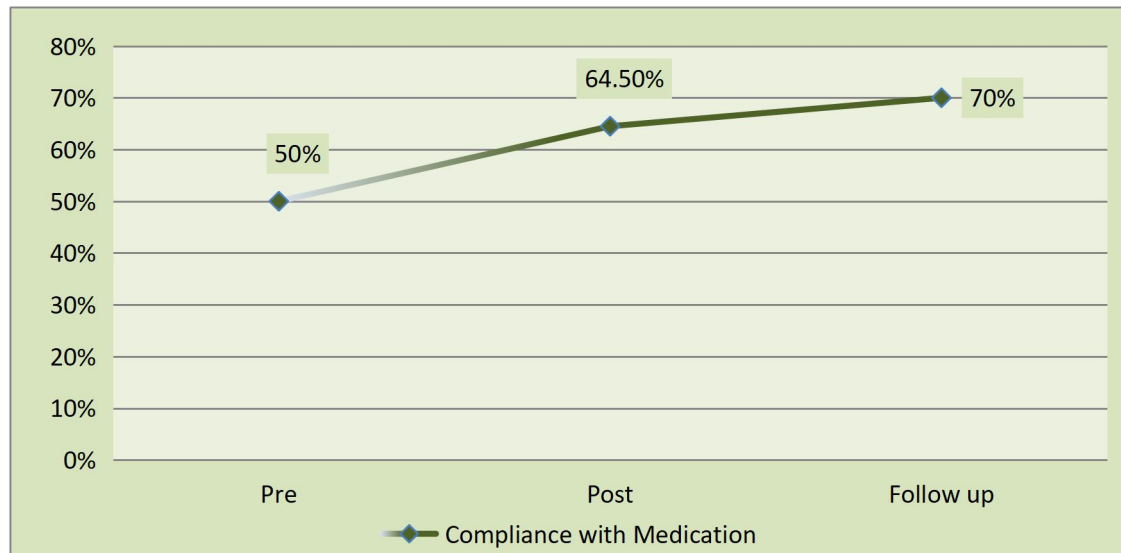


Figure (3): Effect of educational video on elderly patients' compliance with medication

Table (7): Correlation between caregivers' knowledge and elderly patients' health status, elderly patients' self-reported health and caregiver burden

Item	Caregiver knowledge			
	Pre	Post	Follow up	
Elderly patients' Health status (total mean score of PDQ-39)	r	- 0.366	- 0.287	- 0.290
	p	0.001**	0.012*	0.011*
Elderly patients' Self-reported Health	r	-0.461	-0.415	-0.375
	p	(<0.0001)**	(<0.0001)**	0.001**
Caregivers' burden (total mean score of ZBI)	r	-0.334	-0.350	-0.353
	p	0.003**	0.002**	0.002**

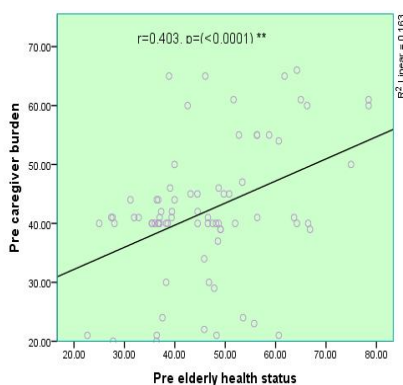


Figure 4: Correlation between caregiver burden and elderly patients' health status pre education video

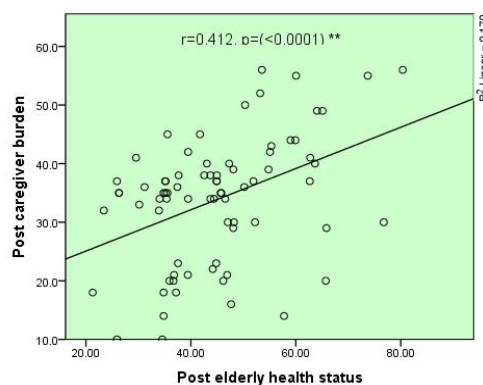


Figure 5: Correlation between caregiver burden and elderly patients' health status post education video

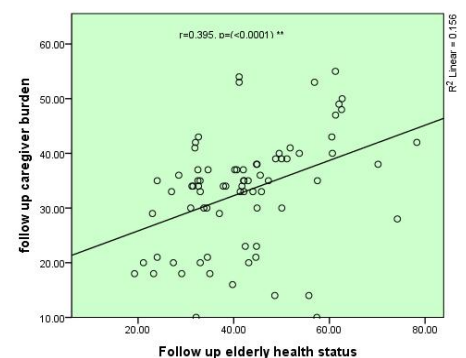


Figure 6: Correlation between caregiver burden and elderly patients' health status in the follow up phase

**Table (8):** Caregivers' evaluation for the program and educational video (n=76).

Program Evaluation	Agree		Agree somewhat		Disagree	
	N	%	N	%	N	%
Had new information	52	92.9	4	7.1	0	0
Helpful in exchange the experiences	48	85.7	5	8.9	3	5.4
Better handling of PD problems	50	89.3	4	7.1	2	3.6
Expectations fulfilled	47	83.9	8	14.3	1	1.8
The information in the videos was very valuable.	46	82.1	9	16.1	1	1.8
Video recordings have been very crucial in increasing understanding	52	92.9	4	7.1	0	0
The videos were easily controlled (to fast-forward, rewind, and repeat the steps).	52	92.9	4	7.1	0	0
The videos' audio and visual qualities were excellent.	50	89.3	6	10.7	0	0
Would participate again	50	89.3	6	10.7	0	0
Recommend educational video to others	49	87.5	7	12.5	0	0
Overall educational video and program was satisfied	52	92.9	4	7.1	0	0

## Discussion

The complexity of Parkinson's disease (PD) resulting from motor and non-motor symptoms affect the patient's health status and that of the caregivers point to the need to study, evaluate, and develop interventions to control the problems of these patients (*Foppa et al., 2018*). Educational programs on the disease can help patients and caregivers in disease understanding, care burden reduction, and health status improvement (*Lee, Woo, Lee, Cheon, & Kim, 2019*). Nowadays, one of the most challenges concern for healthcare professionals and nursing is caring for caregivers. It is therefore advisable to provide caregivers with the expertise, knowledge and skills that they need to take care of their loved ones during clinical practice. One of the responsibilities of the nurses is to manage PD problems, which are the most influential factors in health status, to

transfer information about PD through educational program and follow up and support the implementation of these programs (*Cianfrocca, Caponnetto, Donati, Di Stasio, Tartaglini, & Lancia, 2021*). Additionally, video teaching technology is frequently utilized in nursing as a beneficial instructional tool because it gives family caregivers ongoing access to multi-media, multisensory information about a topic and its context (*Balasubramanian et al., 2018*).

One of the most prevalent late-life neurodegenerative illnesses is PD. Although advances in the treatment, knowledge gap about PD often exists amongst PD patients or their caregivers (*Gultekin et al., 2017*). The result of the present study reported that the majority of the studied caregivers had unsatisfactory knowledge about PD pre educational video. This result may be interpreted by the finding of another study done in Egypt by

*Alwerdani et al., (2022)* who revealed critical gaps in knowledge in Egyptian general public towards Parkinson disease. This finding show a similarity with other studies; the study of *Oki, Otake, Kato, Hatoya (2016)* in Japan, *Gultekin, et al., (2017)* in Turkey and *Choo, et al., (2020)* in Asia shown that caregivers had insufficient information about PD. Also, educational program needs for knowledge were high in PD caregivers in the study of *Lee et al., (2019)* in South Korea and the results of *Udow et al., (2018)* in Canada indicated higher educational needs in patients and caregivers about PD and that there is interest in the development of a visual aid to discuss PD in the clinical setting reflecting poor knowledge about PD.

Developing videos of co-designed health information provides caregivers with a resource to better understand the information offered by the healthcare professionals (*Coyne, Winter, Carlini, Robertson, & Dieperink, 2022*). In the current study, a highly statistical significant increase in caregivers' knowledge post educational video. This result may be explained by the educational video sessions' effectiveness in providing the caregivers with the needed information and assistance they need about PD. Also, videos have the ability to engage viewers by merging various forms of media, which quits caregivers from being distracted from the session by irrelevant details, the situation the often occur with verbal communication, and they can provide information that may be particularly helpful for people with low literacy levels.

Similarly with, *Sarhan, & Elsayed, (2018)* in Egypt in which there was a significant improvement of caregivers'

knowledge score pre- post-instructional guidelines and a qualitative observational study in Sweden done by *Hellqvist, Berterö, Hagell, Dizdar, & SundLevander (2020)* highlight how educational interventions can affect caregivers' comprehension of PD and their ability for managing daily life. Moreover, several studies indicated the effectiveness of a video-based educational program in increasing caregiver's knowledge but in different setting (*Tam, & Schmitter-Edgecombe (2019)* in United States, *Sánchez-Huamash, & Cárcamo-Cavagnaro, (2021)* in Perú and *Nurdiansyah et al., (2021)* in Indonesia).

A significant aspect in the context of neurological diseases such as PD is the caregiver burden (*Tramonti, et al., 2019*). The majority of the studied caregivers in this study suffered from mild to moderate burden with a mean of  $41.71 \pm 11.56$  pre educational video. This result may be due to the disease progression, complexity of the care required and patient's autonomy loss even in routine activities, causing ongoing care necessary added to the commitment and emotions might result in unfavorable feelings in caregivers leading to increased level of stress and burden. The main factors contributing to caregiver burden are feeling abandoned, having inadequate training, and being unable to cope with a relative's disease. This result is in agreement with the study of *Mohammed et al., (2020)* in Egypt, *Carrilho et al., (2018)* in Brazil and *Oguh, Kwasny, Carter, Stell, & Simuni, (2013)* which stressed the fact that there is a high prevalence in caring for PD patients.

However, lower mean of caregiver burden was reported in the study of *Tan et al., (2019)* in Singapore ( $24.6 \pm 15.3$ ), *Martinez et al., 2018* in Canada ( $29.9 \pm 19.3$ )

and *Baby et al., (2021)* in India ( $26.63 \pm 17.09$ ). This difference may be explained by the fact that, while caregiving occasionally being satisfying in our culture, it is nonetheless emotionally taxing, physically demanding, and interferes with the caregiver's ability to take care of themselves. Additionally, social services and respite facilities are limited in Egypt.

The present study revealed a highly significant reduction in the studied caregivers' burden post educational video. This result may be related to the effectiveness of educational video added to the impact of sharing caregiving experiences through theoretical and practical sessions where caregivers could attend sessions, develop technical skills, and exchange experiences, opinions, and worries, thereby reducing burden levels. In accordance with the study of *Khalil, Sorour, Shaala, & Mousa, (2020)* in Egypt in which a statistically significant determined differences in caregivers' burden pre and post in-person tele-support intervention for family caregivers of older adults with PD, the study of *Cianfrocca, Caponnetto, Donati, Lancia, Tartaglioni, & Di Stasio, (2018)* in Italy that highlighted the effect of a multidisciplinary educational course in decreasing the caregiver's burden and increase their awareness and role acceptance. On the other hand, *Coyne et al., (2022)* in Australia revealed the effect of video resources in decreasing caregiving burden.

Elderly PD patients with are susceptible to a decline in health status due to the significant effects of motor and non-motor symptoms which restrict their capacity to engage in everyday activities and take part in recreational and social activities (*Lubomski et al., 2021*).

Supporting this, the results of the present study showed that the health status (PDQ-39) and self-reported health of the studied elderly patients' pre intervention was poor. This finding is congruent with the research done by *Mohammed et al., (2020)* and *Shalash, et al., (2018)* in Egypt. Also, a systematic review and meta-analysis of comparative studies by *Zhao et al., (2021)* in China revealed that PD patients' health state was poorer than that of healthy controls.

The impact of this educational video on health status of the studied elderly patients with PD (PDQ-39 subscales & SRH) had been quite tangible. Previous studies in several nations have discovered that elderly individuals with PD who participate in educational programs had better health status; the study of *Sarhan, & Elsayed, (2018)* in Egypt in which there was significant improvement of PDQ-39 score pre- post-instructional guidelines for family caregivers and *Shadizad, et al., (2018)* in Iran observed a statistically significant decrease ( $p < 0.001$ ) for the total PDQ-39 score at post self-care education, *Hellqvist et al., (2020)* in Sweden revealed that after receiving self-management training for persons with PD and their care partners, patients with PD reported improvements in their perceived PD-related and overall health status and *Navarta-Sánchez et al., (2020)* in Spain revealed that education program improved quality of life of PWP. According to *Dias et al., (2019)* in Brazil; the education program was able to enhance the health status of patients with Parkinson's disease whatever the method of delivery. This data demonstrates that a key element in optimizing chronic disease management is

education. Recent review done by *Oki, (2019)* in Japan, reported that an educational program to neurodegenerative diseases' patient and their family is the first step for improving the health status.

These previous studies involved interventions included information on PD, healthy lifestyles, social resources and caregiver burden and the present study covered these same topics in our educational video. Therefore, it is essential to establish standards to ensure that people with Parkinson's disease (PD) and their family caregivers receive comprehensive care that not only addresses symptoms but also takes into account healthy lifestyles and social resources in order to improve their health and quality of life. Additionally, *Gui & Zhou's (2021)* study in China found that family member support and high-quality nursing interventions can dramatically enhance the negative emotions, quality of life, and daily activities of elderly PD patients.

One of the most prevalent medication-related issues in PD patients is nonadherence to medication and is associated with poor health status (*Straka, Minár, Gažová, Valkovič, & Kyselovič, 2018*). The present study reported that half of the studied elderly were non compliant with medication. This may be due to the complexity of the drug regimen, comorbidity (more than half had another chronic disease rather than PD) and occurrence of side effect associated with dopaminergic drugs. This result was similarly reported by *Straka, et al., (2019)* in Slovakia. However, post implementation of the educational video and in the follow up phase, there was a statistical significant improvement in

medication compliance among the studied elderly. This may be due to improving caregivers' knowledge about importance of medication adherence and the right way to take it.

In congruent with, *Wang, Robinson, & Hardin, (2015)* in China in which caregivers' education significantly improve medication adherence ( $p = 0.04$ ), *Lingler, et al (2016)* in USA in which just raising awareness about the importance of medication adherence by the nurses or social workers can enhance the management of medications by caregivers and *Muñoz-Contreras, Segarra, López-Román, Galera, & Cerdá., (2022)* in Spain who showed that having a caregiver, particularly first-degree family member, increase medication compliance by 85.9%.

In term of the relation between caregivers' knowledge and burden, this study found a strong negative correlation between both. This finding was congruent with *Lee et al., (2019)* in Korea and *Alam, Radwan, & Saleh, (2021)* in Egypt In addition, a highly significant negative correlation between caregivers' knowledge and elderly patients' health status found in this study in which better caregiver knowledge was associated better elderly's health status. This result in line with *Sarhan, & Elsayed, (2018)* in Egypt. This highlights the necessity for PD education programs to be established in local communities in order to enhance social support or other external factors affecting the burden of care.

The present study findings also revealed a strong positive correlation between caregivers' burden and elderly patients' health status. This may be attributed to the significant physical or/and



cognitive deterioration occurred in aging causes an increase in the need for care provided, which may put greater burden on caregivers physically and mentally. Similar result was reported by *Mohammed et al., (2020)* in Egypt. On the other hand, patient health status is one of the main influencing factors of carers' burden in the study of *Modugno (2020)* in Italy. *Rodríguez-Violante, Camacho-Ordoñez, Cervantes-Arriaga, González-Latapí, & Velázquez-Osuna, (2015)* in Mexico and *Costa, Lopes, Campanharo, Batista, & Okuno, (2021)* in Brasil noticed a correlation between perceived caregiver burden and health status of PD elderly. Also, *Rajiah, Maharajan, Yeen, & Lew (2017)* in Malaysia found that the PDQ-39 domains "stigma" and "emotional well-being" of PD patients impacted their caregivers' burden.

In general, the use of video education revealed beneficial effects on knowledge, emotions, decision-making, and advance care planning. Participants in video education also expressed satisfaction and accepted video technology (*Cruz-Oliver, Pacheco Rueda, Viera-Ortiz, Washington, & Oliver, 2020*). Therefore, it was important to assess caregivers' experience regarding the program and educational videos. The program and educational video appeared to be beneficial to all caregivers, who provided vastly positive program feedback in which the majority of the studied caregivers were satisfied. This may be attributed to videos are useful teaching tool that are cost-effective to produce, allow for self-paced learning, and may be accessed by numerous people simultaneously without the need for

healthcare professional necessarily presence. Similar results were found in other studies of *Denny et al., (2017); Tam, & Schmitter-Edgecombe (2019)* and *Stevenson, (2022)* in USA, *Scheepens, Karreman, & De Jong, (2018)* in *Netherlands* and *Sánchez-Huamash, & Cárcamo-Cavagnaro, (2021)*.

The educational video serves as a non-pharmacological, non-invasive, and inexpensive method that can be easily taught to elderly patients and their family caregivers by medical professionals, including nurses. It can supplement caregiver education and provide a format to meet their information needs for reducing caregiver burden, improving caregiver knowledge, and enhancing the health status of elderly patients.

### Limitation

We found that, implementing the educational videos in the outpatient setting was feasible. All the consented family caregiver and elderly patients with PD completed the program. The major logistical issues we encountered when displaying the educational video were caused by the ambient sounds (noise) of the clinics, which distracted the caregivers. The use of headphones by patients and caregivers in upcoming research might be beneficial. Our study additionally includes the drawbacks of having a single arm and not being randomized study. It is obvious that a randomized study will be required to assess the effectiveness of the video as a teaching tool for family caregivers. The design of the upcoming randomized trial

will take into account the results of this study.

### **Conclusion**

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The findings of the present study provide robust evidence that educational videos had positive effects on increasing family caregivers' knowledge and reducing family caregiving burden which leads to improvement in health status of elderly patients with Parkinson disease. In addition, the family caregivers received the videos positively, were very satisfied, would definitely recommend them and considered them helpful. By harnessing the power of technology and education, we can enhance the care experience, improve health outcomes, and ultimately improve the health status for elderly affected by Parkinson's disease.

### **Recommendations**

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1. Implementation of multidisciplinary and nurse led teaching program using video technology in Primary care to improve elderly patients' and family caregivers' knowledge, skills and coping to Parkinson's disease while maintaining better health status.
2. The Parkinson's disease educational video should be accessible at the neurology outpatient clinic and department as a component of the health education for patients and family caregivers.
3. Increase public awareness about the availability and benefits of educational videos for Parkinson's disease patients and caregivers. Utilize various channels, such as social media, healthcare websites, and community outreach programs, to promote the use of educational videos and encourage their adoption in care practices.
4. Further researches need to be conducted to determine factors increase caregivers' burden.

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