Journal of Society Medicine
Research & Review Articles on Diseases
Journal of Society Medicine. 2023; 2(4)

The Association Between Degree of Severity and Number of Medications with Quality of Life in Parkinson's Disease Patients

Marisa Heidiyana[1*], **Khairul Putra Surbakti**[2], **Haflin Soraya Hutagalung**[2]
[1] *Resident of Neurology Department, Faculty of Medicine, University of Sumatera Utara/ Haji Adam Malik General Hospital, Medan, Indonesia*
[2] *Staff of Neurology Department, Faculty of Medicine, University of Sumatera Utara / Haji Adam Malik General Hospital, Medan, Indonesia*

***Corresponding Author**: Marisa Heidiyana, E-mail: chachamarisa32@gmail.com

ARTICLE INFO

Article history:
Received
31 March 2023

Accepted
30 April 2023

Manuscript ID:
JSOCMED-310323-24-4

Checked for Plagiarism: Yes

Language Editor:
Rebecca

Editor-Chief:
Prof. Aznan Lelo, PhD

ABSTRACT

Introduction: Quality of life is an important parameter to be assessed, especially in progressive chronic diseases such as patients with Parkinson's Disease (PD). Parkinson's Disease Questionnaire-39 (PDQ-39) is the most widely used measurement tool in assessing the quality of life of PD patients. In PD, a series of features can affect the quality of life including the degree of disease severity and the number of medications. The aim of this study is to determine the relationship between the severity of the disease and the number of medications with the quality of life of people with PD so that it is hoped that it can help improve the quality of life of PD patients.

Method: This study used a cross-sectional design. The research subjects were PD patients at the Neurology Polyclinic at Haji Adam Malik Hospital Medan from April - November 2020 who met the inclusion criteria. Assessing the severity of the disease using the Hoehn and Yahr and measuring the quality of life using the PDQ 39. Data analysis used the Spearman correlation test for the degree of severity and the Mann-Whitney test for the number of medications.

Results: Of the 47 subjects who met the inclusion criteria, most were males (68.1%), with a mean age of 64.82 ± 9.52 years old, with University graduates as the majority of education level (46.8%) and the civil servant as the majority of a profession (34.0%). Stage 2 on Hoehn and Yahr Scales is the most common severity level of disease (55.3%), and polytherapy is the majority of the number of medications (74.5%). The median value of quality of life is 35, with the lowest score being 10 and the highest score being 98. From the results of the bivariate analysis, it was found that there was a very strong, significant association between the degree of disease severity and the quality of life ($p < 0.001$ $r = 0.872$), and there was a significant difference between the number of medications with the quality of life of Parkinson's disease patients ($p = 0.041$).

Conclusion: There is a very strong association between the degree of severity and the quality of life of people with Parkinson's disease and there is a difference in the quality of life of PD patients between those who receive monotherapy and polytherapy so there is an effect of the number of medication given on the quality of life of Parkinson's disease patients.

Keywords Degree of severity, Number of medications, Quality of life

How to cite: Heidiyana M, Surbakti KP, Hutagalung HS. The Association Between Degree of Severity and Number of Medications with Quality of Life in Parkinson's Disease Patients. *Journal of Society Medicine*. 2023;2(4): 127-136. **DOI: https://doi.org/10.47353/jsocmed.v2i4.48**

INTRODUCTION

Neurological conditions are a major source of disability worldwide, and the prevalence of Parkinson's disease is increasing faster than any other neurological disorder. Parkinson's disease is characterized by the classic motor features of rigidity, bradykinesia, resting tremor, and postural instability [1]. Parkinson's disease was first described and published officially in "An Essay on the Shaking Palsy" in 1817 by a clinician from London, James Parkinson (175S-1824) [2].

An estimated 6.1 million people worldwide had a diagnosis of Parkinson's disease in 2016, 2.4 times higher than in 1990. This increase in prevalence is related to improved methods used to detect and diagnose Parkinson's disease, greater knowledge and awareness of the disease, an aging population, longer life expectancy, and possible increased exposure to the environment (eg, pesticides, solvents, metals) associated with industrialization. Furthermore, in the next 25 years, people with Parkinson's disease will be increasing from now with the largest number being in Asian countries [3]. The incidence of Parkinson's disease in Indonesia has been estimated provisional estimate that there are around 200,000-400,000 sufferers, where males are more affected than females (3:2) [2]. Meanwhile, Susanti et al (2021) in Medan reported that patients with Parkinson's disease were dominated by males at 60.7%, where the average age was 64.96 years [4].

Parkinson's disease can cause a variety of symptoms. In the early of the disease, the most obvious symptoms are related to movement, including tremors, stiffness, slowness of movement, and difficulty walking. Then, cognitive and behavioral problems can present with dementia generally occurring in the later stages of the disease. Other symptoms, including sleep, and emotional problems, depression, difficulty in coordination and speech, severe fatigue, balance problems, and pain will have an impact on the patient's quality of life [5].

Treatments for Parkinson's disease aim to increase the level of dopamine in the brain to reduce motor symptoms and the progression of the disease. Several main drug classes that are widely used in the symptomatic treatment of Parkinson's disease include dopamine precursors (levodopa), dopamine agonists (bromocriptine, pramipexole), MAO-B inhibitors (selegiline, rasagiline), COMT inhibitors (entacapone, tolcapone), and anticholinergic groups (benzatropine, trihexyphenidyl). However, in reality, the drugs used cannot be a long-term treatment solution due to a decrease in efficacy along with the development of dopaminergic nerve neurodegeneration [6,7]. Levodopa has been the drug of choice in the treatment of Parkinson's disease for more than 40 years. Levodopa is often given in combination with other drugs to increase its bioavailability and effectiveness. But on the other hand, long-term use of levodopa can cause side effects like motor complications, and then it can reduce the patient's quality of life [7]. Daily doses of more than 400 mg/day, duration of more than 5 years, and young age have a higher risk of motor complications [8].

Quality of Life (QoL) is a multi-dimensional construct, consisting of three major domains, that is physical, mental, and social which specifically focus on the impact of disease and/or treatment on patient perceptions of their health status and well-being or subjective satisfaction with life [5]. In Parkinson's disease, a series of features can affect the quality of life. Research has shown that symptoms affecting participation in society, limiting mobility, and preventing the independent performance of activities of daily living have the greatest negative impact [9]. Complications caused by treatment with levodopa such as dyskinesia, dystonia, and fluctuations should also be considered [5]. The measurement tool most often used in measuring the quality of life of patients with Parkinson's disease is the Parkinson's disease questionnaire-39 (PDQ-39). PDQ 39 is a sensitive, valid, and reliable measurement tool for assessing several aspects of Parkinson's disease. The aspects assessed cover 8 dimensions, that is mobility, activities of daily living, emotional health, stigma, social support, cognition, communication, and body discomfort. This measuring tool is useful in assessing the effectiveness of disease management in both pharmacological, surgical, and psychological therapy. Furthermore, the quality of life of Parkinson's patients is reported to have a relationship with the severity of the disease, the more severe the severity of Parkinson's disease, the lower the quality of life and vice versa. The Hoehn and Yahr (HY) scale is a measure of the severity of Parkinson's disease that is most often used in research and clinically [10].

Research by Amelia et al in 2013 reported that PDQ-39 has a significant correlation with the level of severity of Parkinson's disease as measured using Hoehn and Yahr Scale. The advantage of this tool is that it is simple, easy, and fast to do. Research conducted by Amelia et al reported that the total value of PDQ 39 showed a correlation with the level of severity according to HY ($r=0.74$; $p<0.01$). The strongest correlation was found in the mobility component ($r=0.02$; $p<0.05$) [10]. In addition to the relationship between quality of life and the number of medications given, Oktariza et al in 2019 reported that there was no difference in the average total score of PDQ 39 between groups receiving combination therapy (polytherapy) and groups receiving levodopa therapy (monotherapy) with p= 0.262 [7].

Therefore, researchers are interested in conducting this research to determine the association between the level of disease severity and the number of medications on the quality of life of people with Parkinson's disease, especially the population in Medan, which in the end is expected to be used as material for the next research about improving health services for Parkinson's patients.

METHOD

This study used a cross-sectional design. The research subjects were Parkinson's disease patients at the Neurology Polyclinic at H. Adam Malik General Hospital Medan during the period April - November 2023. The inclusion criteria were Parkinson's disease patients who were treated at the Neurology Polyclinic at Haji Adam Malik General Hospital Medan and who were willing to give their consent to participate in this study by signing an informed consent. Exclusion criteria were patients with secondary parkinsonism, history of stroke, dementia in the early stages of Parkinson's, other terminal illnesses that could affect the quality of life such as patients with severe metabolic diseases (end-stage kidney disease, end-stage liver disease), other conditions that cause difficulty in processing interview or filling out a questionnaire (mental retardation and psychiatric comorbidities). The total number of samples needed after the calculation is 47 people. The determination of research subjects was carried out according to a consecutive non-random sampling method. Assessment of the severity of the disease used Hoehn and Yahr Scale which is divided into five levels; grade 1 for mild impairment, grade 2 for bilateral mild disability, grade 3 for moderate-severe disability with significant slowing of body movements, grade 4 for severe clinical symptoms and unable to live independently and grade 5 for patients who can only lay on the bed [10].

The number of medications is the number of drugs prescribed by the Neurologist at the research site, that is monotherapy (levodopa) or a combination (more than one drug) between levodopa and anticholinergics or dopamine agonists or all obtained through medical record data and patient history.

Quality of life was assessed using the Parkinson's disease questionnaire–39 (PDQ-39) which includes 8 domains consisting of mobility (ten questions), activities of daily living (six questions), emotional well-being (six questions), stigma (four questions), social support (three questions), cognition (four questions), communication (three questions) and bodily discomfort (three questions). Questions in each domain, as well as in the total scale, can be summarized into an index and transformed linearly to a scale of 0-100 [11].

The research data were analyzed statistically using the Windows SPSS (Statistical Product and Science Service) version 26.0 computer program, then displayed in tabular form to show an overview of the level of severity, number of medications, and quality of life of patients with Parkinson's disease. Data analysis used the Spearman correlation test for the level of disease severity and the Mann-Whitney test for the number of medications.

RESULT

Characteristics of Study Subjects

Of the 47 Parkinson's Disease subjects, most were males (68.1%) and females (31.9%), mean age of 64.82 ± 9.52 years, with University graduate as the majority of education level (46.8%) followed by an elementary school (23.4%), high school (17.0%), junior high school (8.5%) and did not go to school (4.3%). Civil servants as the majority of a profession (34%) followed by unemployed (19.1%), housewives (17.0%), self-employed (14.9%), teachers (8, 5%), worked as security guards, nurses, and priests each for 2.1 %.

The Level of severity of Parkinson's disease is divided into 5 degrees. In this study, stage 2 on the Hoehn and Yahr Scale was the most common severity level of disease (55.3%), followed by stage 3 (27.7%), stage 4 (12.8%) and stage 1 (4.3%), while subjects with a degree of severity of 5 were not found.

Therapy for Parkinson's patients in this study was divided into monotherapy and polytherapy. The highest number of drug administrations were subjects who received polytherapy (74.5%) and those who received monotherapy (25.5%). The quality of life of people with Parkinson's disease was measured using the PDQ 39 questionnaire. The median PDQ 39 was 35 with the lowest score of 10 and the highest score of 98. Complete data regarding the distribution of the characteristics of the study subjects are presented in table 1 below.

Table 1. Characteristics of Research Subject

Characteristics	n=47	Percentage (%)
Age		
Mean (SD)	64,82±9,52*	
Gender		
Male	32	68,1
Female	15	31,9
Level of Education		
Elementary School	11	23,4
Junior High School	4	8,5
Senior High School	8	17,0
University Graduate	22	46,8
No School	2	4,3
Profession		
Civil Servant	16	34,0
Housewife	8	17,0
Enterpreneur	7	14,9
Security	1	2,1
Unemployment	9	19,1
Teacher	4	8,5
Nurse	1	2,1
Pastor	1	2,1
Degree of Severity		
Stage 1	2	4,3
Stage 2	26	55,3
Stage 3	13	27,7
Stage 4	6	12,8
Stage 5	0	0,0
Number of Medication		
Monotherapy	12	25,5
Polytherapy	35	74,5
Quality of Life (PDQ 39)		
Median	35**	
Min-Maks	10-98**	

* Normally distributed data; **Not normally distributed data

Association between Parkinson’s Disease Severity and Quality of Life in Parkinson's Disease Patients

The quality of life of Parkinson's disease patients was measured by the PDQ 39 questionnaire. Based on the Spearman correlation test, there was a significant strong association between the severity of Parkinson's disease and quality of life in Parkinson’s Disease patients at the Neurology Polyclinic at Haji Adam Malik General Hospital Medan ($p<0.001$, $r= 0.872$) and there is a unidirectional association between the two variables, thus it can be interpreted that the higher the severity of the disease, the worse the quality of life for people with Parkinson's disease, which is indicated by the increasing PDQ 39. Complete data regarding the association between the severity of the disease and quality of life are presented in table 2 below.

Table 2. Association between Parkinson's Disease Severity and Quality of Life in Parkinson's Disease Patients

Degree of Severity	PDQ 39 Score Median (Min-Max)	p-value	Correlation Coefficient
Stage 1	12 (10-16)	p <0,001	0,872
Stage 2	28 (13-44)		
Stage 3	49 (32-75)		
Stage 4	83 (67-98)		

Spearman Correlation Test

The Association between the Number of Medication with the Quality of Life in Parkinosn's Disease Patients

The number of medication administrations in this study was divided into two categories, that is monotherapy using only levodopa and polytherapy using levodopa combined with other drugs such as dopamine agonists, anticholinergics, and COMT inhibitors. Based on the Mann-Whitney test, there was a difference in the quality of life of people with Parkinson's disease between those who get monotherapy and polytherapy (p = 0.041), thus it can be interpreted that there is an effect of giving the amount of drug on the quality of life of people with Parkinson's disease. Complete data regarding the relationship between the number of drugs and quality of life are presented in table 3 below.

Table 3. Association Between Number of Medication and Quality of Live in Parkinson's Disease Patients

Number of Medication	PDQ 39 Score Median (Min-Max)	p Value
Monotherapy	47 (10-98)	0,041
Polytherapy	32 (13-72)	

Mann Whitney Test , p < 0,05

DISCUSSION

Characteristics of Subject

This study was attended by 47 research subjects who met the inclusion and exclusion criteria, the mean age of the study subjects was 64.82 ± 9.52 years with the youngest age being 45 years and the oldest being 86 years. These results are in line with previous research by Susanti et al (2021) which was conducted at the Neurology Polyclinic at H. Adam Malik General Hospital, Medan, which reported that the study subjects had an average age of 66.5 ± 6.7 years [4]. According to Tambun et al (2021), who conducted a study of people with Parkinson's disease at Palembang City Hospital, the majority of people with Parkinson's disease were aged 61-70 years (40.4%). The highest incidence of Parkinson's is between the ages of 40-80 years and decreases at the age below 40 years and over 80 years. This is due to the progressive chronic degenerative process in Parkinson's disease where the main protector of neurons against oxidative stress, that is Dopamine Transporter (DAT) decreases with increasing age [12]. Collier et al (2011) said the aging process induces the pre-parkinsonism stage and the cellular mechanism of dopaminergic neuron death becomes accelerated or aggregated in Parkinson's disease along with genetic and environmental factors. The pathophysiology of Parkinson's disease is also related to the process of oxidative stress due to mitochondrial dysfunction which causes the production of Reactive Oxygen Species (ROS) and mediates lysosome autophagy. With increasing age, there is an accumulation of mitochondrial damage and degradation by the lysosome system which is associated with damage to dopamine neuron cells [13].

The number of patients with Parkinson's disease in this study was dominated by 32 male subjects (68.1%) and 15 female subjects (31.9%). This is also in line with previous research conducted by Susanti et al (2021) which reported the number of people with Parkinson's disease at H. Adam Malik General Hospital Medan was dominated by the male sex at 65.2% compared to only 34.8% for women [4]. This research is also in line with that conducted by Tambun et al (2021) who reported that the majority of people with Parkinson's disease were men at 55.8% compared to women at 44.2% [12]. A meta-analysis study by Hirsch et al (2016) also showed a male incidence of 61.21 per 100,000 population per year and almost twice that of women, namely 37.55 per 100,000 population per year [14]. According to Lukas et al (2015) and Tambun et al (2016), the reason Parkinson's disease is more common in men is still not known with certainty but is thought to be due to the protective effect of sex hormones on women and more often men are exposed to work-related toxins and head injuries [14,15].

Based on educational background, the majority were tertiary institutions with 22 research subjects (46.8%), elementary schools with 11 subjects (23.4%), and middle and high schools respectively with 4 subjects (8.5%) and 8 subjects (17%). Research by Oktariza et al (2019) also shows that the majority of Parkinson's sufferers have tertiary education and work [7]. Tambun et al (2021) reported that the educational level of most people with Parkinson's disease was at tertiary institutions and elementary schools, at 26.9% followed by junior high and high school graduates each with 23.1%. Low educational status is associated with a minimal ability to access information related to the disease and its treatment, whereas those with higher educational status tend to pay more attention to clinical symptoms that arise and seek information regarding treatment [12].

Based on occupation, most were civil servants with 16 subjects (34%). This is also in line with the findings of Szasz et al (2020) in Romania, where most Parkinson's patients have civil servant work backgrounds including retirees, namely 93.1% [16]. Subjects with several jobs that involve physical activity have a reduced risk of Parkinson's disease. Office-based work will increase the risk of Parkinson's disease. Research by Ellise et al (2014) conducted a population-based cohort study of 28,778 subjects born between 1886 and 1950 reporting that the more complex a job related to data and people, the higher the risk of developing Parkinson's disease. Jobs that require greater complexity with data and people may involve higher levels of stress and involve interpersonal conflict. Increased stress is associated with increased levels of glutamate which are involved in the occurrence of Parkinson's disease [17].

The degree of disease severity in Parkinson's disease is divided into 5 degrees. In this study, there were at most 26 subjects (55.3%) with degree 2, followed by 13 subjects (27.7%) 3rd degree, 4th degree (12.8%), and 1st degree (4.3%), while for subjects with a degree of severity of 5 was not found. This is in line with a previous study by Adinda et al (2020) which reported that most people with Parkinson's disease at Medan HAM Hospital were stage 2 with 13 subjects (56.5%) [18]. Amelia et al (2014) who conducted a study of Parkinson's patients at the Hasan Sadikin Hospital Polyclinic in Bandung also reported that the most visits of Parkinson's disease patients to the polyclinic were patients with Parkinson's disease with degree 2 of 42.2% [10]. Tambun et al (2021) reported that the majority of patients with Parkinson's disease who control go to the hospital with degrees 3 (35%) and degrees 2 (30%). This may be caused by the disability factor caused by the symptoms of the disease. In patients with Parkinson's degree 1 Hoehn and Yahr, the average patient has not complained too much about the symptoms they are experiencing, so they have not come to the hospital to seek treatment, while in degrees 2 and 3, the patient is already bothered by the symptoms they are experiencing, so they tend to seek medical treatment. In degrees 4 and 5, the patient already has a severe disability, making it difficult to be taken to the hospital for treatment [12]. Hoehn and Yahr's degree of severity has a range of values starting from degree 1 for mild impairment, grade 2 indicates mild bilateral disability, grade 3 indicates moderate-severe disability with significant slowing of body movements, grade 4 indicates severe clinical symptoms and unable to live independently and grade 5 for patients living in bed. It is on this basis that people with more severe degrees of Parkinson's are difficult to find in outpatient care because of their disabilities [2].

Therapy for Parkinson's patients in this study was divided into monotherapy and polytherapy. In this study, it was found that the highest number of subjects who received polytherapy were 35 subjects (74.5%) and those who received monotherapy were 12 subjects (25.5%). This is in line with previous research by Susanti et al (2021) which reported that most patients with Parkinson's disease at Medan HAM Hospital received 78.15% polytherapy and 21.85% monotherapy [4]. This is slightly different from a study by Tambun et al (2021) which reported that the majority of patients with Parkinson's disease received polytherapy or a combination of 100% and there were no patients who only received monotherapy [12]. Agents that increase dopamine concentrations or stimulate dopamine receptors, namely levodopa and dopamine agonists, are still the mainstay of therapy for motor symptoms in Parkinson's disease. Although Levodopa is the most effective pharmacological agent and the gold standard in the study of new pharmacological agents, it carries a high risk of motor complications. Daily doses of more than 400 mg/day, duration of more than 5 years, and young age have a higher risk of motor complications. Based on the Parkinson's disease management algorithm, patients with Parkinson's disease aged ≥ 60 years are given levodopa treatment as monotherapy, and for those aged <60 years, polytherapy with a combination of levodopa, dopamine agonists and anticholinergics can be given [2,8]. In the early stages of the disease, response to symptomatic therapy is very effective for controlling symptoms, both levodopa and dopamine agonists, monotherapy, or in combination. This is also known as the "honeymoon period which can last for 3-6 years. However, at an advanced stage, this response decreases and motor complications appear. Long-term use of levodopa, motor complications can occur. In preventing and managing motor fluctuations In this case, several methods are used, including delaying the use of levodopa in young patients (age < 60 years), using Dopamine Agonist (DA) as initial therapy, new drugs for management and prevention, initial therapy with new MAO-B inhibitors (rasagiline) [2].

Association between Parkinson’s Disease Severity and Quality of Life in Parkinson's Disease Patients

Based on the Spearman correlation test, there was a significant strong association between the severity of Parkinson's disease and the quality of life of people with Parkinson's disease ($p<0.001$, $r= 0.872$) and there was a unidirectional association between the two variables, thus it can be interpreted that the higher the level of disease severity making the worse the quality of life of people with Parkinson's disease which is marked by the increasing of PDQ 39 score.

This study is in line with a study by Oktariza et al (2019) regarding the severity of disease based on the Hoehn and Yahr scale on patient quality of life, the results showed that there was a significant difference in the average total PDQ-39 score between groups of patients with HY 3 and HY 4 ($p<0.01$) [7]. Amelia et al (2014) reported that PDQ-39 has a significant correlation with the degree of disease severity based on the Hoehn and Yahr scale ($r=0.74$; $p<0.01$) [10]. The same thing was also reported by Lukas et al (2015) that there was a positive correlation between the severity of the disease and the PDQ-39 total score ($r=0.660$ and $p<0.001$) [15]. The severity of the disease affects most of the quality of life dimensions (PDQ-39 dimension). Severe disability will limit the patient's mobility which will ultimately lead to a decrease in quality of life. The same thing was shown by Tambun et al (2021) where the PDQ-39 dimension correlates with the severity of the disease (Hoehn and Yahr scale) [12].

The Association between the Number of Medication with the Quality of Life of Parkinson's Disease Patients

Based on the Mann-Whitney test, there was a difference in the quality of life of people with Parkinson's disease between those who get monotherapy and polytherapy with a significance value of $p = 0.041$ ($p <0.05$), so it can be interpreted that there is an effect of giving the amount of drug administration on the quality of life of people with Parkinson's disease. It can happen because the study sample tends to receive combination therapy in patients with early stages so that the treatment pattern does not differ between patients with mild and severe stages, but for treatment options based on age, in this study majority of the patients with ages ≥ 60 years receive monotherapy (levodopa), this is by the algorithm of Parkinson's disease management for ages ≥ 60 years receiving monotherapy (levodopa) and ages <60 years receiving polytherapy with a combination of levodopa, dopamine agonists and anticholinergics [2,8].

These results from other studies that have been conducted with the majority reporting no difference between monotherapy and polytherapy on the quality of life of patients with Parkinson's disease. Silitonga et al (2007) who examined the administration of levodopa combination therapy at Kariadi Hospital in Semarang reported that there was no significant difference between the administration of levodopa polytherapy with various combinations of other drugs (p-value = 0.641), this could have occurred due to the unequal sample distribution. Because the administration of therapy is also based on the severity of the patient according to Hoehn and Yahr [19]. The results of this study are also not in line with research by Lukas (2015) where there was no significant association between the number of medications and the quality of life of Parkinson's sufferers which could be due to the study sample tending to use a combination therapy in patients with early stages of Parkinson's disease so that the treatment pattern given in mild stages and severe stages are relatively similar [15]. This study is also not in line with research by Oktariza et al (2019) where there was no significant difference in the average PDQ-39 total score between the combination therapy groups (p=0.262) but there was a significant difference in the quality of life in the variable motor complications (p <0.001) [8].

The difference in the results of this study with other studies is thought to be due to considerations in selecting initial therapy based on specific symptoms and the patient's age according to the guidelines for the management of Parkinson's disease and the availability of Parkinson's drugs in the hospital. As Parkinson's disease progresses, treatment should be adjusted to provide optimal symptom control [53]. The choice of therapy for Parkinson's disease is based on several factors, such as the patient's age, disease severity, level of functional disability, cognitive status, and drug-related side effects. Modifications to the therapeutic regimen are necessary to address motor complications that arise during treatment. Although Levodopa is the most effective pharmacological agent and the gold standard in the study of new pharmacological agents, it carries a high risk of motor complications. Daily doses of more than 400 mg/day, duration of more than 5 years, and young age have a higher risk of motor complications. While the effectiveness of dopamine agonists is still lower than levodopa, it has quite a lot of side effects and is more severe than levodopa, such as cognitive impairment, hallucinations, orthostatic hypotension, and impaired impulse control. Some things that can be done to overcome motor complications that will later affect the quality of life of people with Parkinson's disease are increasing or adjusting the dose of dopaminergic agents according to the patient's response and tolerance to treatment, adding other dopaminergic medications, dividing the levodopa dose into smaller doses by increasing the frequency of dosing (levodopa dose fractionation) or adding a COMT (catechol O-methyltransferase) inhibitor, such as entacapone or tolcapone, to prolong the effect of levodopa. Treatment of Parkinson's disease is expected to improve symptomatic symptoms and improve quality of life from the patient's perspective [7].

LIMITATIONS OF RESEARCH

This study has limitations, the sample distribution is uneven, does not describe in detail the dimensions affected in Parkinson's patients with poor quality of life, and does not include comorbid factors, patient compliance factors, and socioeconomic factors that may affect the quality of life. In addition, this study did not measure daily doses of drugs equivalent to levodopa as well as motor and non-motor complications due to levodopa use which later play a role in the quality of life of people with Parkinson's disease.

CONCLUSION

There is a very strong association between the severity of the disease and the quality of life of people with Parkinson's disease (p<0.001 r=0.872) and there is a difference in the quality of life of people with Parkinson's disease who receive monotherapy and polytherapy (p=0.041) so that there is an effect of the number of drugs on the quality of life of people with the Parkinson's Disease.

DECLARATIONS

Ethics approval and consent to participate. Permission for this study was obtained from the Ethics Committee of Universitas Sumatera Utara and H. Adam Malik General Hospital.

CONSENT FOR PUBLICATION

The Authors agree to publication in Journal of Society Medicine.

FUNDING
This research has received no external funding.

COMPETING INTERESTS

None.

AUTHORS’ CONTRIBUTIONS

All authors significantly contribute to the work reported, whether in the conception, study design, execution, acquisition of data, analysis, and interpretation, or in all these areas. Contribute to drafting, revising, or critically reviewing the article. Approved the final version to be published, agreed on the journal to be submitted, and agreed to be accountable for all aspects of the work.

ACKNOWLEDGMENTS
None

REFERENCE

1. Armstrong MJ, Okun MS. Diagnosis and Treatment of Parkinson Disease: A Review. JAMA. 2020; 323(6): 548–560.
2. Kelompok Studi Movement Disorder PERDOSSI. Buku Panduan Tatalaksana Penyakit Parkinson dan Gangguan Gerak Lainnya; 2015.
3. GBD 2016 Parkinson’s Disease Collaborators. Global, regional, and national burden of Parkinson’s disease, 1990–2016. A systematic analysis for the Global Burden of Disease Study 2016. The Lancet. Neurology. 2018; 17(11): 939–953
4. Susanti F. Hubungan ansietas dan depresi dengan tremor pada pasien penyakit Parkinson. Repository USU. Tesis. Universitas Sumatera Utara; 2021.
5. Opara J, Brola W, Leonardi M, Leonardi B. Quality of life in Parkinson’s disease. Journal of medicine and life. 2012; 5(4): 375–81.
6. Ellis JM, Fell MJ. Current approaches to the treatment of Parkinson’s Disease. Bioorganic & medicinal chemistry letters. 2017; 27(18): 4247–55.
7. Oktariza Y, Amalia L, Sobaryati S. Evaluasi Kualitas Hidup Pasien Parkinson Berdasarkan Terapi Berbasis Levodopa. Indonesian Journal of Clinical Pharmacy. 2019; 8: 4.
8. Dewati E, Tunjungsari, Ariarini N. Penyakit Parkinson. Dalam : Anindhita T, Winnugroho W, editors. Buku Ajar Neurologi. Edisi 1. Jakarta: Departemen Neurologi Fakultas Kedokteran Universitas Indonesia; 2017.p. 105-35.
9. Soh SE, McGinley J, Watts J, Iansek R, Murphy A, Menz H. Determinants of health-related quality of life in people with Parkinson’s disease: a path analysis. Quality of Life Research: an international journal of quality of life aspects of treatment, care and rehabilitation. 2013; 22 (7): 1543–53.
10. Amelia D, Syamsudin T, Ganiem AR. Penilaian kualitas hidup pasien Parkinson menggunakan PDQ-39 dan korelasinya dengan tingkat keparahan penyakit. Neurona. 2014; 31(3):1
11. Marinus J, Ramaker C, van Hilten JJ, Stiggelbout AM. Health related quality of life in Parkinson’s disease: a systematic review of disease specific instruments. Journal of neurology, neurosurgery & psychiatry. 2002; 72 (2): 241-8. DOI: 10.1136/jnnp.72.2.241
12. Tambun O, Marisdina S, Bahar E. Faktor-faktor yang mempengaruhi kualitas hidup penderita penyakit parkinson dengan menggunakan Parkinson's Questionnaire-39. Jurnal neurona. 2021; 38 (4): 1
13. Collier TJ, Kanaan NM, Kordower JH. Ageing as a primary risk factor for Parkinson’s disease: evidence from studies of non-human primates. Nature Reviews Neuroscience. 2011; 12(6): 359–66.
14. Hirsch L, Jette N, Frolkis A, Steeves T, Pringsheim T. The Incidence of Parkinson’s Disease: A Systematic Review and Meta-Analysis. Neuroepidemiology. 2016; 46 (4): 292–300.

15. Lukas A, Subagya, Setyopranoto I. Korelasi antara ansietas, depresi, dan gangguan kognitif terhadap kualitas hidup penderita penyakit Parkinson. Berkala NeuroSains. 2018; 17 (3): 133-41.
16. Szasz JA, Simu M, Perju-Dumbrava L, Antonini A, Bergmann L, Popescu D. et al. Efficacy, safety and patient's quality of life of long-term treatment with levodopa-carbidopa intestinal gel in advanced parkinson's disease in romania: results from gloria observational study. Romanian Journal of Neurology. 2020; 19 (1): 27–35.
17. Valdes EG, Andel R, Sieurin J, Feldman AL, Edwards JD, Langstrom N. et al. Occupational Complexity and Risk of Parkinson's Disease. Plos One. 2014; 9(9): 1-5.
18. Adinda F, Anwar Y, Hutagalung SH. Hubungan disfungsi otonom dengan kualitas hidup pada pasien penyakit parkinson. Tesis. Sumatera Utara: Fakultas Kedokteran Sumatera Utara, Program Pendidikan Dokter Spesialis; 2020.
19. Silitonga RS. Faktor-faktor yang berhubungan dengan kualitas hidup penderita parkinson di Poliklinik Saraf RS Dr. Kariadi. Tesis. E-Journal Undip. Universitas Diponegoro; 2017.