Official Journal of the International Parkinson and Movement Disorder Society

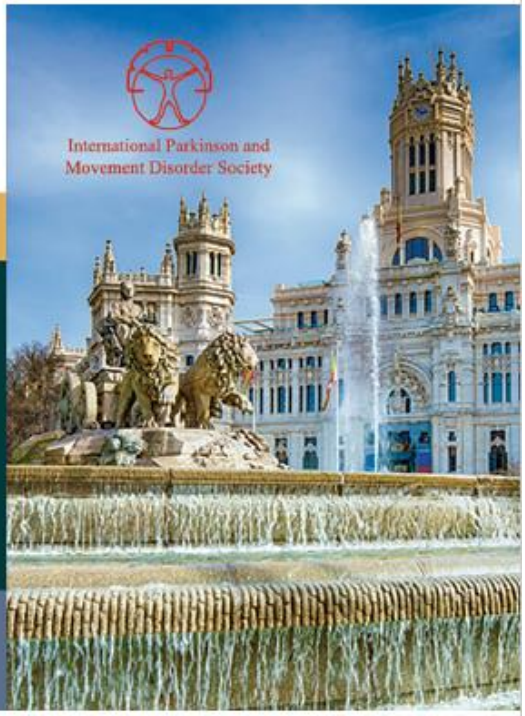
Movement Disorders

Volume 37 | Supplement 2 | September 2022

International Congress of Parkinson's Disease and Movement Disorders®

MADRID, SPAIN

September 15-18, 2022



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Mod. Duration of pauses bef. Action Utterance: Sum of the duration of all pauses before action utterances divided by the number of utterances
Mod. Duration pauses before action verbs: sum of the durations of all pauses before action verbs divided by the number of action verbs in the speech

Methods: 61 patients with PD [table 1] were asked to describe the cookie theft picture [6]. We manually identified action verbs (AV) and action utterances (AU, utterances containing at least one AV). Pauses were measured using Praat (v5.3.72, www.praat.org). Pauses > 0.5 sec. before AV and > 2 sec. before AU were considered clinically relevant. To control for the amount of speech produced, modified pause variables were calculated. The total duration of pauses before AV and AU were divided by the number of total AV and the total number of utterances, respectively. Spearman's correlations between linguistic variables and motor severity (MDS-UPDRS Part III) and global cognitive function (MoCA) were calculated. We ran a logistic regression model with the dependent variable cognitive status (MCI or normal cognition, by consensus criteria [7]), and predictors modified AV and AU pauses, controlled for age, sex, and motor score.

Results: Modified AU pauses were inversely correlated to MoCA (rho= -0.311, p=0.016) [table 2] but not significantly correlated with motor score. In logistic regression, there was a significant association of modified AU pauses with cognitive status, after controlling for age, sex, and motor score (OR 63.38, p=0.036).

Conclusions: In PD, pauses before AU in spontaneous speech are more associated with cognitive than motor impairment, suggesting there is difficulty planning sentences related to action. The lack of association with motor severity goes against the embodied cognition theory and suggests that language deficits in PD may be markers of cognitive function.

References: [1]Cardona, J. F., Kargieman, L., Sinay, V., Gershanik, O., Gelormini, C., Amoruso, L., Roca, M., Pineda, D., Trujillo, N., Michon, M., García, A. M., Szenkman, D., Bekinschtein, T., Manes, F., & Ibáñez, A. (2014). How embodied is action language? Neurological evidence from motor diseases. Cognition, 131(2), 311–322. https://doi.org/10.1016/j.cognition.2014.02.001 [2] Rodrigues, I. T., Ferreira, J. J., Coelho, M., Rosa, M. M., & Castro-Caldas, A. (2015). Action verbal fluency in Parkinson 's patients. Arquivos de neuro-psiquiatria, 73(6), 520–525. [3] Whitfield, J. A., & Gravelin, A. C. (2019). Characterizing the distribution of silent intervals in the connected speech of individuals with Parkinson disease. Journal of communication disorders, 78, 18–32. [4] Huber, J. E., Darling, M., Francis, E. J., & Zhang, D. (2012). Impact of typical aging and Parkinson's disease on the relationship among breath pausing, syntax, and punctuation. American journal of speech-language pathology, 21(4), 368–379. https://doi.org/10.1044/1058-0360(2012/11-0059) [5] Ash, S., McMillan, C., Gross, R. G., Cook, P., Gunawardena, D., Morgan, B., Boller, A., Siderowf, A., & Grossman, M. (2012). Impairments of speech fluency in Lewy body spectrum disorder. Brain and language, 120(3), 290–302. https://doi.org/10.1016/j.bandl.2011.09.004 [6] Goodglass, H., Kaplan, E., & Weintraub, S. (2001). BDAE: The Boston Diagnostic Aphasia Examination. Philadelphia, PA: Lippincott Williams & Wilkins. [7] Cholerton, B. A., Zabetian, C. P., Wan, J. Y., Montine, T. J., Quinn, J. F., Mata, I. F., Chung, K. A., Peterson, A., Espay, A. J., Revilla, F. J., Devoto, J., Watson, G. S., Hu, S. C., Leverenz, J. B., & Edwards, K. L. (2014). Evaluation of mild cognitive impairment subtypes in Parkinson's disease. Movement disorders: official journal of the Movement Disorder Society, 29(6), 756–764. https://doi.org/10.1002/mds.25875

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Impact of Nonmotor Symptoms on The Quality of Life of Parkinson's Disease Patients

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Objective: This study examined the effect of nonmotor symptoms on the quality of life (QoL) of Parkinson's disease (PD) patients.

Table 2. Logistic Regression Analysis of Factors Affecting QoL of PD Patients

	Variables	B	Sig.	Exp(B)	95% CI.for EXP(B)	
					Lower	Upper
Step 1[a]	Stadium	1.159	.029	3.186	1.127	9.007
	Sensory Symptoms	1.327	.070	3.771	.898	15.837
	Constant	-3.992	.011	.018		

Background: Parkinson's disease has a very broad clinical spectrum, ranging from classic motor symptoms to heterogeneous nonmotor symptoms. Motor symptoms inhibits daily activities and their effects on the patients' QoL are very noticeable. On the other hand, nonmotor symptoms often receive less attention and how they affect the QoL of PD patients has not been widely studied.

Methods: This observational study with cross-sectional design was conducted in outpatient clinic at three hospitals in Palembang city, South Sumatera, Indonesia. Patients diagnosed with PD based on the criteria of the United Kingdom Parkinson's Disease Society Bank and agreed to follow the study were included as subjects, while patients with language disorders were excluded from the study. Patients were then interviewed about the study variables, including the Non-Motor Symptom Questionnaire (NMSQ) and Parkinson's Disease Questionnaire-39 (PDQ-39) with a cut-off value of 34.4. The data was analyzed with Chi-square or Fisher's exact tests and logistic regression.

Results: Of the 52 subjects, most were >60 years old (69.2%) and male (55.8%). The majority of patients were at stage 3 (59.6%) by Hoehn and Yahr stadium and had suffered from PD for ≥5 years (63.5%). Neuropsychiatric symptoms are experienced by all patients. Autonomic symptoms were the second most common nonmotor symptoms (94.2%), followed by gastrointestinal symptoms and sleep disorders (88.5% each), while sensory symptoms and other symptoms were experienced by only 25% and 23.1% of subjects. PD patients with a good QoL (59.6%) out of those with poor QoL (40.4%). Bivariate analysis showed that the stage of the disease, the duration of the disease and sensory symptoms significantly affected the patient's QoL (p values 0.009; 0.006; 0.014; respectively) [table 1]. However, in multivariate analysis only stages (OR 3,186, CI 95% 1,127-9,007) and sensory disorders (OR 3,771, CI 95% 0,898-15,837) that affect the quality of life of PD patients (p=0.029 and 0.070) [table 2].

Conclusions: Although they do not pose any direct physical barriers, nonmotor symptoms still play a role in determining the QoL of PD patients. Given that nonmotor symptoms in PD vary widely, even less common symptoms still have the potential to decrease patients' QoL.

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Factors that negatively impact the sexual function of women living with Parkinson's disease

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Objective: To investigate the impact of motor and non-motor alterations and couple adjustment on sexual function in women living with PD in Brazil.

Background: Among the non-motor alteration associated with Parkinson's disease, sexual dysfunction is less discussed and, consequently, less known. Satisfactory sexual function has been associated with better quality of life even in elderlies. Therefore, it is imperative to know which motor and non-motor alterations negatively affect sexual function in order to find new approaches to improve this vital function.

Methods: Thirty women with a confirmed diagnosis of idiopathic PD for 6.36 years (SD 4.49); mean age of 53,33 years (SD=6.74), in stage 1 – 3 of disease evolution according to Hoehn and Yahr classification, without dementia, participated in the present study. After presenting the informed consent form and expressing agreement to participate in the study, participants were asked to answer, through telephone interviews, a

Impact of Nonmotor Symptoms on The Quality of Life of Parkinson's Disease Patients

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Background

Parkinson's disease is the second most progressive degenerative disease after Alzheimer's disease in old age.[1] The prevalence of parkinson's disease is 100-200 per 100,000 population and the incidence per year is around 15 per 100,000 population.[2] In Indonesia there are estimated to be 876,665 parkinson's sufferers out of a total population of 238,452,952.[1,2,3,4,5] Parkinson's disease is common in men, with a ratio of men to women 3 : 2.[1,2]

People with Parkinson's disease are very susceptible to experiencing a decrease in the quality of life, this is influenced by the progressivity of Parkinson's disease itself. The clinical manifestations of Parkinson's disease in the form of motor and nonmotor disorders affect the patient's level of disability and ultimately reflect the patient's quality of life.[3,4] The decline in brain function that occurs with age can also increase limitations in daily activities and have an impact on reducing the quality of life.[5-8]

In recent decades, there have been several studies both abroad and domestically related to the quality of life in people with Parkinson's disease. Research by Moreira et al in Brazil in 2017 examined factors related to the decline in quality of life in people with mild to moderate degrees of Parkinson. This cross-sectional study was carried out in 2 groups, namely the group of people with mild degrees of Parkinson's disease (Hoehn Yahr 1 and 2) consisting of 50 people and the group of people with moderate degree parkinson's disease (Hoehn Yahr 3) consisting of 50 people. The results of this study stated that in people with moderate degree of Parkinson's, the decline in quality of life is related to stigma, cognitive aggravation, severe mobility impairment and dependence on daily activities.[9] Researcher Yun-Ru Lai et al in Taiwan in 2018 on clinical factors related to the quality of life of people with parkinson's disease stated that non-motor symptoms affect the quality of life of people with Parkinson's disease. Early detection and

early management of non-motor symptoms can improve the quality of life of people with Parkinson's disease.[10]

One special questionnaire that is considered valid, sensitive and reliable for measuring the quality of life of Parkinson's patients is the Parkinson's Disease Questionnaire-39 (PDQ-39). This questionnaire can be the right instrument, because it has been tested and has qualified clinical characteristics and has been validated and translated in various countries to assess the quality of life of people with Parkinson's disease.[11] Research in Indonesia on factors related to the quality of life of people with Parkinson's disease using PDQ-39 has been conducted by several researchers. In a study by Silitonga et al in 2007 concluded that there was a relationship between the stage of the disease, the incidence of depression and social activity with the quality of life of people with Parkinson's disease while the sex, age, type of treatment, cognitive impairment, symptoms of dyskinesia were not related to the quality of life of people with parkinson's disease. This study has limitations where the PDQ-39 questionnaire used was not validated by the PDQ-39 questionnaire which was translated into Indonesian so that there was still bias in this study.[12] This study aims to determine the effect of nonmotor symptoms on the quality of life of people with Parkinson's disease who were examined with Parkinson's Disease Questionnaire 39 at Palembang City Hospital.

Methods

This observational study with cross-sectional design was conducted in outpatient clinic at three hospitals in Palembang city, South Sumatera, Indonesia—namely Mohammad Hoesin General Hospital, Bhayangkara Hospital, and Pusri Hospital—from June to September 2020 Patients diagnosed with PD based on the criteria of the United Kingdom Parkinson's Disease Society Bank and agreed to follow the study were included as subjects, while patients with language disorders were excluded from the study. Patients were then interviewed about the study variables, including demographic characteristics (age and gender), clinical characteristic (stage and duration of the disease), the Non Motor Symptom Questionnaire (NMSQ) and Parkinson's Disease Questionnaire-39 (PDQ-39) with a cut-off value of 34.4. The data was analyzed with Chi-square or Fisher’s exact tests and binary logistic regression.

Results

From the results of the study, 69.2% of Parkinson's patients were over 60 years old and 30.8% of Parkinson's patients were aged under 60 years with an average age of 65.13±10.28 years and the majority were in the age range of 61-70 years, namely 21 people (40.4%). The highest age range with a good quality of life is 61-70 years, which is 38.7%, while the highest age range with a poor quality of life is 61-70 years, which is 42.9%. Men were the majority gender in this study, namely 29 patients (55.8%) while women were 23 people (44.2%). The proportion of patients with a good and bad quality of life was dominated by men (54.8% and 57.1%, respectively).

In this study, the majority (59.6%) of Parkinson's patients had a severity of stage 3 (based on Hoehn and Yahr). The highest stage in Parkinson's disease patients with good quality of life and poor quality of life was also stage 3, namely 61.3% and 57.1%. Stage of the disease has a significant relationship to quality of life with p value of 0.009.

Based on the duration of suffering from Parkinson's disease, it was found that as many as 33 people with Parkinson's disease (63.5%) had suffered from parkinson's disease ≥5 years and 19 people (36.5%) who had parkinson's disease <5 years. As many as 51.6% of Parkinson's disease patients with a duration of <5 years of disease have a good quality of life, while 85.7% of parkinson's disease patients with a duration of ≥5 years of disease have a poor quality of life. The duration of the disease has a significant association with the quality of life with p value of 0.006.

Based on non-motor symptoms experienced by people with Parkinson's disease, gastrointestinal symptoms were obtained as much as 88.5% (46 people), autonomic symptoms 94.2% (49 people), neuropsychiatric symptoms 100% (52 people), sleep disorders 88.5% (46 people), sensory disorders 25% (13 people) and other symptoms 23.1% (12 people). Of the 6 nonmotor symptoms, only sensory symptoms had a significant association with a quality of life with p value of 0.014.

From the multivariate analysis of binary logistic regression, it was found that the stage of the disease (OR 3.186, CI 95% 1.127-9.007) and sensory symptoms (OR 3.771, CI 95% 0.898-15.837) were the most influential on the quality of life with p values p=0.029 and p=0.070, respectively.

Table 1. Subjects' Characteristics

Characteristics	Quality of Life		p value
	Good n (%)	Poor n (%)	
Age (n=52)			
41 – 50 years	2 (6.5)	2 (9.5)	0.689*
51 – 60 years	9 (29.0)	3 (14.3)	
61 – 70 years	12 (38.7)	9 (42.9)	
71 – 80 years	7 (22.6)	5 (23.8)	
≥ 81 years	1 (3.8)	2 (9.5)	
Gender (n=52)			
Male	17 (54.8)	12 (57.1)	0.870*
Female	14 (45.2)	9 (42.9)	
Stage of the disease (n=52)			
Stage 1	5 (16.1)	1 (4.8)	0.009*
Stage 2	7 (22.6)	2 (9.5)	
Stage 3	19 (61.3)	12 (57.1)	
Stage 4	0 (0.0)	6 (28.6)	
Duration (n=52)			
< 5 years	16 (51.6)	3 (14.3)	0.006*
≥ 5 years	15 (48.4)	18 (85.7)	
Nonmotor symptoms			
Gastrointestinal symptoms	27 (87.1)	19 (90.5)	1.000**
Autonomic symptoms	29 (93.5)	20 (95.2)	1.000**
Neuropsychiatric symptoms	31 (100)	21 (100)	-
Sleep disorders	26 (83.9)	20 (95.2)	0.382**
Sensory symptoms	4 (12.9)	9 (42.9)	0.014*
Other symptoms	5 (16.1)	7 (33.3)	0.188**

*Chi-square test; **Fisher's exact test

Table 2. Logistic Regression Analysis of Factors Affecting QoL of PD Patients

	Variables	B	Sig.	Exp(B)	95% CI.for EXP(B)	
					Lower	Upper
Step 11[a]	Stage of the disease	1.159	.029	3.186	1.127	9.007
	Sensory Symptoms	1.327	.070	3.771	.898	15.837
	Constant	-3.992	.011	.018		

Discussions

In this study, a total of 52 people with Parkinson's disease were obtained, of which as many as 69.2% of Parkinson's patients were over 60 years old and 30.8% of Parkinson's patients were under 60 years old with an average age of 65.13 ± 10.28 years and the majority were in the age range of 61-70 years, namely 21 people (40.4%). This finding is in line with the research of Tarukbua, et al in 2016 at RSUP Prof. Dr. R. D. Kandau Manado, where from 31 patients,

the most prevalence of age was obtained in the age range of 61-70 years.[13] In another study by Pradnyaning, et al in 2019, the average age was 63.85 ± 8.68 years, this is not much different from the average age in the current study.[14] In another study of Yasinda, et al in 2019, it was found that 51.52% of Parkinson's patients were over 60 years old with an average age of 61,030 ± 9,122 years.[15] Based on the literature, the highest incidence is between the ages of 40 – 80 years and decreases at the age of under 40 years and over 80 years. This is due to the degenerative process that takes place chronically progressively in Parkinson's disease where the main protector of neurons against oxidative stress, namely dopamine transporter (DAT) decreases with age, so that in elderly people there tends to be a decrease in dopamine production which is important in the mechanism of parkinson's disease.[4,17]

In this study, more men were found than women, 29 patients (55.8%) while women were 23 people (44.2%). Based on the literature Parkinson's disease is most common in men, with a ratio of men to women 3:2.[1,2] The reason parkinson's disease is more common in men is still not known for sure, but it is suspected to be due to the protective effects of sexual hormones on women and the more frequent exposure of men to exposure to work-related toxins and head injuries.[1,4,7,24,25] A systematic review conducted by Geogriev in 2017 said that some data suggests that this may be related to the protective role of estrogen in women because the incidence of Parkinson's becomes more abundant in post-menopausal women compared to women who have not menopause. In addition, evidence suggests that women with Parkinson's experience early menopause and are more likely to undergo hysterectomy compared to controls. Gender differences in the prevalence and incidence of Parkinson's may also be due to different risk factor, environmental and/or genetic profiles.[17-22]

In this study, the majority (59.6%) of parkinson's patients had a severity degree of stage 3 (based on Hoehn and Yahr), followed by stage 2 as much as 17.3%, stage 1 and 4 as much as 11.5%. In 2017 study of Enders et al, a metaanalysis that reported the prevalence of Parkinson's from 5 different databases showed that the severity (stage) of Hoehn and Yahr 3 was the most in people with Parkinson's disease (35%), then stage 2 Hoehn and Yahr (30%), stage 4 Hoehn and Yahr (17%), stage 1 Hoehn and Yahr (13%) and stage 5 Hoehn and Yahr (4%).[23] In another study by Melka et al, there were 37 people with stage 1 (23.9%), 46 people with

stage 2 (29.7%), 44 people with stage 3 (28.4%), 23 people with stage 4 (14.8%) and 5 people with stage 5 (3.2%).[24] This may be due to the disability factor caused by the symptoms of the disease. In patients with Parkinson's degree 1 Hoehn and Yahr, the average sufferer has not complained too much about the symptoms experienced so he has not come to the hospital to seek treatment while in degrees 2 and 3 the sufferer is already bothered with the symptoms experienced so he tends to seek medical treatment. At degrees 4 and 5, the patient already has a severe disability, making it difficult to take treatment to the hospital.

In this study, based on the duration of suffering from Parkinson's disease, it was found that as many as 33 people with Parkinson's disease (63.5%) had suffered from parkinson's disease ≥ 5 years and 19 people (36.5%) who suffered from parkinson's disease <5 years. The research of Yasinda et al (2019) found that as many as 54.55% of people with Parkinson's disease had a duration of ≥ 5 years and those who had a duration of < disease of 5 years as much as 45.45%.[15] Similar findings were also obtained in the study of Achbani et al (2020) in 180 people with Parkinson's disease, where it was found that as many as 64% of patients with a duration of suffering from Parkinson's disease ≥ 5 years and 36% with a duration of < 5 years.[59] Parkinson's disease is a neurodegenerative disease that is progressive in nature where over time the symptoms experienced by both motor and non-motor symptoms will become more aggravating. The duration of the disease is also correlated with the stage of parkinson's disease.[15,25]

Based on non-motor symptoms experienced by people with Parkinson's disease, gastrointestinal symptoms were obtained as much as 88.5% (46 people), autonomic symptoms 94.2% (49 people), neuropsychiatric symptoms 100% (52 people), sleep disorders 88.5% (46 people), sensory disorders 25% (13 people) and other symptoms 23.1% (12 people). In 2018, study by Tibar et al involving 117 people with Parkinson's Disease, 82.6% of non-motor symptoms were experienced, namely 82.6% of urinary tract function disorders, 80% of gastrointestinal disorders, 80.6% of sleep disorders, 86.3% of autonomic disorders, neuropsychiatric disorders in the form of depression 47.9%, anxiety 50.9%, sensory disorders (in the form of pain 11.1%, olfactory disorders 28%) and other symptoms in the form of fatigue 23.1%.[26] In Tagliati et al's research in the form of a systematic review with metaanalysis, it was found that the most common non-motor symptoms were

autonomic symptoms (nocturia 59.7%, urinary urgency 54.6%) gastrointestinal symptoms in the form of constipation (48.5%), neuropsychiatric symptoms (depression 51.7%, anxiety 46.9%, easy forgetting 45.5%) and sleep disorders (insomnia 44.7%).[61] In 2019, study by Osama et al found that the most non-motor symptoms were gastrointestinal symptoms (constipation 73.1%), followed by autonomic symptoms (sexual dysfunction 61%, nocturia 36.9%), neuropsychia symptoms (depression 47.5%, anxiety 31.7%) and sleep disorders (insomnia 34.1%).[27]

In the analysis of the effect of age on the quality of life of Parkinson's patients, it was found that the most age with a good quality of life was 61-70 years, which was 38.7%, while the highest age range with poor quality of life was 61-70 years, which was 42.9%. In this study, it was found that age did not have a significant relationship with the quality of life with p value = 0.689. This is in line with the research of Lukas et al (2015) and the study of Silitonga et al (2007) where there was no meaningful relationship between age and the quality of life of people with Parkinson's disease.[28] Parkinson's disease affects more than 1% of the total population of the population aged more than 60 years, which is equivalent to 127,000 residents in the United Kingdom (or 500,000 residents in the USA), while as the age increases, there is an increase in prevalence by 5% after reaching the age of 85 years.[16] The study by Diederich et al., (2003) comparing Parkinson's subjects by age, explained that in the age of 78-92 years there were significantly worse motor disorders ($p < 0.05$) than patients aged 43-66 years. This may be related to differences in the rate of nigrostriatal degeneration, differences in compensatory mechanisms in the highly aging brain that eventually result in a progressive decrease in motor function, as well as the large number of comorbidities in elderly patients. Decreased motor function will result in a decrease in the quality of life in people with Parkinson's disease.[29] There are many studies that try to explain the relationship between old age and the loss of dopaminergic neurons in substantia nigra pars compacta. One of them is the oxidative stress theory related to dopamine metabolism. As we age, there is an increase in oxidative stress activity and dopamine cells tend to be more prone to mitochondrial dysfunction which ultimately disrupts dopamine metabolism and increases damage to those cells.[16]

In the analysis of the influence of sex on the quality of life of Parkinson's sufferers,

it was found that the sex with the most good quality of life in people with Parkinson's disease was 54.8%, as well as in people with Parkinson's disease with poor quality of life, the majority were men as much as 57.1%. In this study, it was found that the sex category did not have a significant relationship with the quality of life with a p value = 0.870. The research of Lukas et al found that gender did not have a meaningful relationship with quality of life, similar to the research of Hendrik et al where it was found that there was no significant difference between male sufferers and female sufferers with quality of life.[28,30] Although in the current study there is no difference in the quality of life of male compared to female patients, there is a greater percentage of male sex, which is 51.7% with a poor quality of life than women. A study by Baba et al (2005) of 1264 people with Parkinson's disease, found that the majority of patients were male (66.7%) and 33.3% were women.[31] The large number of male patients with Parkinson's disease is associated with the predominant estrogen protective effect in women against the neurodegeneration of dopamine nigostriatal region. Estrogen is actually not limited only to women, but also to men with low testosterone levels, but women of productive age have high estrogen levels in the body and decrease after menopause, causing women who have menopause to be at equal risk of suffering from Parkinson's disease compared to men.[19,22]

Based on the analysis of the impact of Parkinson's stage on quality of life, it was found that the most stages in people with good quality of life and poor quality of life were stage 3, namely 61.3% and 57.1%. In this study, it was found that stage has a significant relationship with quality of life with p value of 0.009. The research of Amelia et al (2014) found that the degrees of Hoehn and Yahr were strongly correlated with PDQ-39 ($r : 0.74$, $p<0.0001$).[32] Research conducted by Moreira et al in Brazil in 2017 showed that in people with moderate degree of Parkinson's disease (Stage 3) it is associated with a decrease in the quality of life in the stigma domain, cognitive aggravation, severe mobility impairment and dependence on daily activities.[9] Research by Yasinda et al (2019) concluded that there is a relationship between the stage of the disease and the quality of life of people with Parkinson's. The severity of the disease suffered by the patient affects most of the dimensions of the quality of life (dimensions pdq-39).[15] Severe disabilities will limit the mobility of patients which will eventually lead to a decrease in the quality of life. Similar result shown by Souza

et al (2007) where the dimensions of PDQ-39 correlate with the severity of the disease (Hoehn and Yahr scales).[33]

In the distribution of the duration of suffering from Parkinson's disease to the quality of life, it was found that 51.6% of people with Parkinson's disease duration (long suffering from Parkinson's disease) < 5 years had a good quality of life, while 85.7% of people with parkinson's disease duration with a duration of ≥ disease of 5 years had a poor quality of life. In this study, it was found that the disease duration category had a significant relationship with a quality of life with a p value of 0.006. Souza's research in 2007 found that among 46 subjects of his study the average duration of Parkinson's disease was 7.4 years and the duration of the disease had a correlation to the dimensions of PDQ-39, which are daily activities and communication..[33] Research by Yasinda et al (2019) found that the duration of suffering from Parkinson's disease affects the overall quality of life.[15] Prange's research in 2018 found that the duration of the disease played a role in the advanced complications of Parkinson's when the duration of the disease was more than 5 years. First, motor fluctuations show a parallel pattern of risk evolution, with a sharp initial increase within 4 years of diagnosis. The hazard rate predicted at 5 years was 124.8 (95% CI 95.1–163.9) per 1,000 people-years in men and 166.7 (95% CI 125.7–221.2) in women aged 65 years at the time of diagnosis related to motor fluctuations and 71.2 (95% CI 49.1-103) in men and 101.2 (95% CI 69.2–148.2) in women related to dyskinesia. Second, 6 years after diagnosis, the level of hazard for postural instability and the risk of falling increased significantly, with ratio of 706 in men (95% CI 499.9–997.2) and 871 in women (95% CI 610.2–1,243.3) at 10 years. Third, the level of hazard freezing gait and dementia also increases dramatically along with the duration of the disease, with a more than 10-fold increase in risk intensity in 10 years after diagnosis compared to 1 year after diagnosis. Fourth, hallucinations and impulse control disorders had a slower pattern of risk evolution as the disease progressed, as high as 93.9 (95% CI 66–133.7) in men and 93.1 (95% CI 64–135.4) in hallucination-free women at 10 years, and 34.6 (95% CI 22.2–54) in men and 22.7 (95% CI 13.8–37.4) in women free from impulse control disorders.[34] Parkinson's disease is a chronic and progressive neurodegenerative disease. The longer the patient experiences Parkinson's disease, the more it can increase the risk of worsening symptoms, both motor symptoms and non-motor symptoms which can be seen

from the severity of the disease (Hoehn and Yahr scales).

In this study, it was obtained from 6 non-motor symptoms, only sensory symptoms had a significant relationship to quality of life with a p value of 0.014. Pain or sensory symptoms are frequent complaints in Parkinson's disease that decrease the quality of health-related life (QOL) and interfere with the patient's ability to daily activities and contribute to sleep disorders or major depression. The frequency of pain is considered to have a bimodal distribution. The initial peak seems to occur before, or during the onset of Parkinson's disease and the second peak occurs later as the disease progresses and has a relationship with the development of motor fluctuations. The spectrum of sensory symptoms is very wide, and the most common places that experience pain are the back, legs, and shoulders. In cases, pain occurs on the side that is more related to the motor symptoms of Parkinson's, but an unusual distribution, such as back pain or discomfort in the upper or lower abdomen as well as pain in the limb members related to the motor fluctuations experienced. The basis of the etiology of pain associated with Parkinson's disease is multifactorial. Central mechanisms include impaired monoaminergic mechanisms of intrinsic pain modulation related to pain experienced by people with Parkinson's disease. Dopaminergic deficit as a pain-causing factor related to Parkinson's disease is supported by improvements from pain after administration of L-dopa, which suggests that the basal ganglia play a central role in processing nociceptive information.[35,36] Tibar's study in 2018 found that the most common non-motor symptoms were impaired urinary tract function (82.6%), sleep disorders (80.6%), and gastrointestinal (80%). Other autonomic dysfunctions are also common: thermoregulation dysfunction 58.6%, cardiovascular problems 50.9%, and sexual dysfunction 47.9%, also depression about 47.9% and symptoms of fatigue 23.1%. All non-motor symptoms correlate with quality of life, especially autonomic symptoms in the form of cardiovascular and gastrointestinal symptoms are associated with quality of life especially in the mobility dimension. Univariate and multivariate analyses showed that the SCOPA-AUT score had an impact on quality of life ($p = 0.001$), especially gastrointestinal symptoms ($p = 0.007$), and cardiovascular ($p = 0.049$).[26] In Kadastik study in 2015 found that among the 268 patients screened, 99.6% complained of at least one non-motor symptom and the average number of non-motor symptoms was

6.7±2.5 per patient of symptoms included in MDS-UPDRS part I. The most frequent non-motor symptoms were cognitive impairment, nighttime sleep disturbance, urinary tract disorders, fatigue, pain, daytime sleepiness and depression. Hallucinations and compulsive impulsive disorder (ICD) are the least reported non-motor symptoms.[3] The difference in the findings in this study with previous studies may be due to differences in the number of samples and measuring instruments used.

This study has some limitations. Uneven distribution of samples so that there are variables that cannot be analyzed. This study did not describe in detail the dimensions affected in people with Parkinson's disease who have a poor quality of life. The study also did not include comorbid factors, patient compliance factors and socioeconomic factors that are likely to affect the quality of life.

Conclusions

Nonmotor symptoms may not have a direct impact on the patient's motor skill and mobility but these symptoms may nonetheless affect the quality of life of Parkinson's disease patients. This study showed even less common nonmotor symptoms, potentially decreasing patients' quality of life.

References

1. Kelompok Studi Movement Disorder PERDOSSI. Buku Panduan Tatalaksana Penyakit Parkinson dan Gangguan Gerak Lainnya. 2015.
2. Tysnes OB, Storstein A. Epidemiology of Parkinson's disease. *J Neural Transm*. 2017;124(8):901-905. doi:10.1007/s00702-017-1686-y
3. Kadastik-eerme L, Rosenthal M, Paju T, Muldmaa M, Taba P. Health-related quality of life in Parkinson ' s disease : a cross-sectional study focusing on non-motor symptoms. *Health Qual Life Outcomes*. 2015:1-8. doi:10.1186/s12955-015-0281-x
4. Joseph Jankovic ET. *Parkinson's Disease and Movement Disorders*. Sixth. New York: Wolters Kluwer; 2015.
5. Prachi Bansode, Vaishnavi Chivte APN. A Brief Review on Parkinson ' s Disease. *Pharmacol Toxicol*. 2018;7:509-527.
6. Klietz M, Lange F, Paracka L, Dressler D. Association of Motor and Cognitive Symptoms with Health-Related Quality of Life and Caregiver Burden in a German Cohort of Advanced Parkinson's Association of Motor and Cognitive Symptoms with Health-Related Quality of Life and Caregiver Burden in a Ger. 2020; (February). doi:10.1155/2020/5184084.
7. Fereshtehnejad S, Shafieesabet M, Farhadi F. Heterogeneous Determinants of Quality of Life in Different Phenotypes of Parkinson's Disease. 2015: 1-17. doi:10.1371/journal.pone.0137081
8. Medicina F De, Transtornos G De. Quality of life in Parkinson's disease. 2017:493-494.
9. Moreira RC, Zonta MB, Araújo APS de, Israel VL, Teive HAG. Quality of life in Parkinson's disease patients: progression markers of mild to moderate stages. *Arq Neuropsiquiatr*. 2017;75(8):497-502. doi:10.1590/0004-282x20170091

10. Ru Lai Y, Jih Su Y, Yueh Cheng K, et al. Clinical Factors Associated with the Quality Of Life in Patients with Parkinsons disease. *Neuropsychiatry (London)*. 2018; 08(01): 119-125. doi:10.4172/neuropsychiatry.1000332
11. Ja O, Brola W, Leonardi M, B B. Quality of life in Parkinson's Disease. 2012; 5(4): 375-381.
12. Robert Silitonga. Faktor - faktor yang berhubungan dengan kualitas hidup penderita parkinson di Poliklinik Saraf RS Dr. Kariadi. 2007.
13. Tarukbau FR, Tumewah R MJ. Gambaran Fungsi Kognitif Penderita Parkinson di Poliklinik Saraf RSUP Prof. Dr. R. D. Kandou Manado. . *J e-Clinic (eCl)*,. 2016;Volome 4(Nomor 1).
14. Pradnyaning PE, Widyastuti K, Laksmidewi AP, Trisnawati SY, Samatra DPGP SI. Profil Gangguan Neurokognitif pada penderita penyakit Parkinson di Rumah Sakit Rujukan di Kota Denpasar Tahun 2018. *Callosum Neurol Publ Elektron*. 2019.
15. Oktariza Y, Amalia L, Kurniawati MY, et al. Evaluasi Kualitas Hidup Pasien Parkinson Berdasarkan Terapi Berbasis Levodopa Evaluation of Health-related Quality of Life in Patients with Parkinson ' s Disease : A Levodopa-based Therapy Approach. 2019; 8(4). doi:10.15416/ijcp.2019.8.4.246
16. Reeve A, Simcox E, Turnbull D. Ageing and Parkinson's disease: Why is advancing age the biggest risk factor? *Ageing Res Rev*. 2014;14(1):19-30. doi:10.1016/j.arr.2014.01.004
17. Georgiev D, Hamberg K, Hariz M, Forsgren L, Hariz GM. Gender differences in Parkinson's disease: A clinical perspective. *Acta Neurol Scand*. 2017; 136(6): 570-584. doi:10.1111/ane.12796
18. Shulman LM. Gender differences in Parkinson's disease. *Gend Med*. 2007;4(1):8-18. doi:10.1016/S1550-8579(07)80003-9
19. Miller IN, Cronin-Golomb A. Gender differences in Parkinson's disease: Clinical characteristics and cognition. *Mov Disord*. 2010;25(16):2695-2703. doi:10.1002/mds.23388
20. Nitkowska M, Czyżyk M, Friedman A. Reproductive life characteristics in females affected with parkinson's disease and in healthy control subjects – a comparative study on polish population. *Neurol Neurochir Pol*.2014; 48(5): 322-327. doi:10.1016/j.pjnns.2014.08.004
21. Nitkowska M, Tomasiuk R, Czyzyk M, Friedman A. Prolactin and sex hormones levels in males with Parkinson's disease. *Acta Neurol Scand*. 2015; 131(6): 411-416. doi:10.1111/ane.12334
22. Benedetti MD, Maraganore DM, Bower JH, et al. Hysterectomy, menopause, and estrogen use preceding Parkinson's disease: An exploratory case-control study. *Mov Disord*. 2001; 16(5): 830-837. doi:10.1002/mds.1170
23. Enders D, Balzer-Geldsetzer M, Riedel O, et al. Prevalence, Duration and Severity of Parkinson's Disease in Germany: A Combined Meta-Analysis from Literature Data and Outpatient Samples. *Eur Neurol*. 2017; 78 (3-4): 128-136. doi:10.1159/000477165
24. Melka D, Tafesse A, Bower JH, Assefa D. Prevalence of sleep disorders in Parkinson's disease patients in two neurology referral hospitals in Ethiopia. *BMC Neurol*. 2019;19(1):4-9. doi:10.1186/s12883-019-1431-2
25. Achbani A, Ait Wahmane S, Elatiqi M, et al. Gender and Age Difference in Clinical Features and severity of Parkinson's Disease: A Cross-Sectional Study in Southern Morocco. *Arch Neurosci*. 2020;7(3). doi:10.5812/ans.106239

26. Tibar H, El Bayad K, Bouhouche A, et al. Non-motor symptoms of Parkinson's Disease and their impact on quality of life in a cohort of Moroccan patients. *Front Neurol*. 2018;9(APR):1-12. doi:10.3389/fneur.2018.00170
27. Ragab OA, Elheneedy YA, Bahnasy WS. Non-motor symptoms in newly diagnosed Parkinson's disease patients. *Egypt J Neurol Psychiatry Neurosurg*. 2019; 55(1): 1-7. doi:10.1186/s41983-019-0070-2
28. Lukas, Andre, Subagya IS. Korelasi Antara Ansietas, Depresi, dan Gangguan Kognitif Terhadap Kualitas Hidup Penderita Penyakit Parkinson. *Neurosains*. 2015; 17(3): 133-141.
29. Jellinger KA. Parkinson Disease with Old-Age Onset [3]. *Arch Neurol*. 2003; 60(12): 1814-1815. doi:10.1001/archneur.60.12.1814
30. Lussy Natalia Hendrik, Purwa Samantra TE. *Depresi Berkorelasi Dengan Rendahnya Kualitas Hidup Penderita Parkinson*.; 2013.
31. Baba Y, Putzke JD, Whaley NR, Wszolek ZK, Uitti RJ. Gender and the Parkinson's disease phenotype. *J Neurol*. 2005; 252(10): 1201-1205. doi:10.1007/s00415-005-0835-7
32. Amelia D, Syamsudin T, Ganiem AR. Penilaian kualitas hidup pasien parkinson menggunakan pdq-39 dan korelasinya dengan tingkat keparahan penyakit quality. 2014;31(3).
33. Souza RG, Borges V, Maria S, Azevedo C De, Fferraz HB. Quality of life scale in parkinson ' s disease PDQ-39 (Brazilian Portuguese version) to assess patients with and without levodopa motor fluctuation. 2007;65(April):787-791.
34. Prange S, Danaila T, Caire C, Metereau E, Broussolle E, Maucort-boulch D. Age and time course of long-term motor and nonmotor complications in Parkinson disease.2019.doi:10.1212/WNL.0000000000006737
35. Cury RG, Galhardoni R, Fonoff ET, Lloret SP, Ghilardi MGS, Barbosa ER. Sensory abnormalities and pain in Parkinson disease and its modulation by treatment of motor symptoms. 2016: 151-165. doi:10.1002/ejp.745
36. Rezende M, Blood Y, Ferro MM, et al. Classification and Characteristics of Pain Associated with Parkinson ' s Disease. 2016; 2016.