

تقييم مستويات جودة حياة المسنين المصابين بالمرض الرعاشي (مرض الباركنسون) في مدينة بغداد

Assessing the Levels of Quality of Life for elderly People inflicted by Parkinson's Disease in the City of Baghdad

Maan H. I. Al-Ameri, PhD*

Wafaa Abd Ali Hatab, MSc**

* Instructor, Mental Health Nursing Department, College of Nursing, University of Baghdad

** Assistant. Instructor, Adult Nursing Department, College of Nursing, University of Baghdad,

E:mail:hmh_57@yahoo.com

المستخلص:

الخلفية: يعتبر مرض الباركنسون (المرض الرعاشي) من الأمراض التنكسية التي تصيب الجهاز العصبي المركزي محدثاً أعراض تسوء مرور الزمن. وهذا المرض على الرغم من انه يؤدي الى الإعاقة في النهاية إلا أنه يتطور بشكل تدريجي، وتكون الاعراض ما بين الارتجاج المستمر وغير مسيطر عليه؛ حركات تناعمية لليدين والذراعين والساقين وحتى الفكين. وبعده تتطور الاعراض الى تصلب عضلات الاطراف والكتف والرقبة. تصاحب هذا المرض مشاكل نفسية وأجتماعية خطيرة بالإضافة للمشاكل الجسمية والتي بدورها تؤثر بشكل مباشر أو غير مباشر على نوعية الحياة التي يعيشها هؤلاء المصابون ان كانوا بين عوائلهم أو في المصحات الخاصة لمثل هذه الحالات.

الأهداف: تهدف الدراسة لتقييم مستويات نوعية الحياة التي يتصف به المسنين المصابين بمرض الباركنسون (المرض الرعاشي) في مدينة بغداد ولإيجاد أي علاقة إحصائية بين تلك المستويات وبعض المواصفات الديموغرافية للمسنين.

طريقة البحث: دراسة وصفية تم إنجازها بين العاشر من آذار، ٢٠١٣ والعاشر من تموز، ٢٠١٣. كانت عينة البحث بالطريقة التصادفية غير الاحتمالية لـ ١٥٦ من المسنين المصابين بمرض الباركنسون (المرض الرعاشي) من الذين يتم علاجهم في مستشفيات مدينة بغداد التخصصية للأعصاب ومنها مستشفى الجملة العصبية التعليمي، مستشفى التخصصات العصبية وكذلك من الذين يقيمون في داري رعاية المسنين في الرشاد وصليخ. استخدمت الدراسة أساليب خاص لغرض هذه الدراسة والذي تضمن جزئين: المعلومات الديموغرافية والجزء الآخر يتضمن ٣٩ فقرة لقياس مستويات نوعية الحياة. تم تحليل البيانات باستعمال الأحصاء الوصفي: التكرار والنسبة المئوية، والأحصاء الاستدلالي.

النتائج: كشفت الدراسة بأن ٥٥.٨% من المشاركين يمتلكون مستوى ضعيف من نوعية الحياة. وجدت الدراسة علاقة دلالة إحصائية بين مستوى نوعية الحياة مع مكان العينة ولم تجد الدراسة علاقة بين مستويات نوعية الحياة مع باقي المواصفات الديموغرافية.

التوصيات: توصي الدراسة بتحسين ظروف دور رعاية العجزة وإضافة نشاطات إجتماعية وترفيهية أكثر لهذه الدور مع إدامة التواصل مع أهالي هؤلاء العاجزين المصابين بمرض الباركنسون. وكذلك عرضهم المتواصل على الأخصاصيين من أجل متابعة صحتهم وعلاجهم.

Abstract

Background: Parkinson's disease is a degenerative disorder of the central nervous system and it is considered a progressive disorder whose symptoms become worse over time. Individuals with Parkinson's disease (PD) are confronted with physical, psychological, and psychosocial issues that impact quality of life (QoL). Parkinson's disease happens most commonly in the people of middle age and elderly, though roughly 10% of patients are under the age of forty. Although Parkinson's disorder may finally be disabling, the disease often only progresses gradually. The primary feature of Parkinson's disease is tremors which are the uncontrolled and rhythmic movements of the hands, arms, legs and even jaw. Later on, muscle rigidity, or stiffness of the limbs, occurs in all muscle groups but is commonly in the arms, shoulders and neck.

Objectives: The study aims to assess the levels of quality of life of elderly with Parkinson's disease in Baghdad city and then to find out relationship between these levels and some demographic characteristic.

Methods: A descriptive study was performed between 10th of March, 2013 and 10th of July 2013. A non-probability accidental sample of 156 elderly diagnosed with Parkinson's disease. Participants were recruited from a variety of places; two elderly Nursing Homes, and two Neurological Teaching hospitals: the Neurological Specialties Hospital and Neurological hospital, in the city of Baghdad. A constructed questionnaire was used in this study. This questionnaire consists of two parts; demographic characteristics; gender, age, marital status, number of children, occupation and duration of illness; and 39 items [Parkinson's Disease Questionnaire-39 (PDQ-39)]. Data were analysed by applying descriptive and inferential analysis.

Results: The results indicate that 55.8% of the participants have poor level of quality of life. There is a significant association between levels of quality of life and the place of recruitment but there is no association between the levels of quality of life and other demographic characteristics of the elderly with Parkinson's disease.

Recommendations: The study recommends improving the circumstances in the elderly nursing homes and to add more social and recreational activities within these Homes, in addition supervising their condition and treatment by the specialists.

Keywords: Assessing, quality, life, elderly, Parkinson's, city, Baghdad.

Introduction

Parkinson's Disease (PD) can be the most important source of a range of different symptoms for individuals⁽¹⁾. Early in the course of the disease, the most obvious symptoms are movement-related symptoms, including tremor which are the uncontrolled and rhythmic movements of the hands, arms, legs and even jaw; slowness of movement and difficulty with walking and gait^(2,3). Later on, muscle rigidity, or stiffness of the limbs, occurs in all muscle groups but is commonly in the arms, shoulders and neck. In addition, cognitive and behavioural problems may arise, with dementia commonly occurring in the advanced stages of the disease⁽²⁾.

Although Parkinson's disorder may finally be disabling, the disease often only progresses gradually⁽³⁾. Other symptoms including sleep and emotional problems, depression, difficulties in coordination and speech, severe fatigue, problems with balance and pain will have an impact on the patient's quality of life^(3,17). During the final stage a gradual loss of automatic movement, including eye blinking and decreased frequency of swallowing, bradykinesia (unsteady walk), Impaired speech, and then more difficulties in swallowing^(4,5,6).

Parkinson's disease can lead to neurological and psychiatric symptoms which may range in different levels. These symptoms include disturbances of speech, behaviour, cognition, mood, and thought^(7,8). Cognitive disturbances can happen in the early stages of the disease. The most common cognitive disturbance is executive dysfunction, such as problems with planning, cognitive flexibility, abstract thinking, and rule acquisition, initiating appropriate actions and inhibiting inappropriate actions. Fluctuations in attention and slowed cognitive speed are among other cognitive disturbances. Memory is affected, specifically in recalling learned information^(9,10,11). The patient with Parkinson's disease has two to six times the risk of suffering dementia compared to the general population^(1,8).

Sufferers of Parkinson's disease are confronted with physical, psychophysical, and

even psychosocial problems that dramatically affect their quality of life^(12,13,14,15). It has been increasingly identified that health-related quality of life as a major principle in assessment of health interference, in particular, as it connects to Parkinson disease, in relation to both motor and neuropsychological disturbances⁽¹⁶⁾.

Methodology

A descriptive study was performed between 10th of March 2013 and 10th of July 2013. A non-probability accidental sample of 156 elderly diagnosed with Parkinson's disease. Participants were recruited from a variety of places; two elderly nursing homes, and two Neurological hospitals in Baghdad city. A constructed questionnaire was used in this study. This questionnaire consists of two parts; demographic characteristics; gender, age, marital status, number of children, occupation and duration of illness; and 39 items [Parkinson's Disease Questionnaire-39 (PDQ-39)⁽¹²⁾] which are subcategorised into eight groups: mobility, activities and daily, emotional well being has six items each, stigma, cognitions has four items each; social support, communication and bodily discomfort has three items each.

The questionnaire was completed by the researcher for each participant during the interview. For the severity of the anxiety and depression disorders; 0-7 indicates that there is no disorder; 8-10 indicates the Mild level of anxiety or depression; 11-15 refers to a Moderate level of both disorders; and 16-21 indicates a severe level. The statistical analysis was achieved by using the descriptive statistics (frequency and percentage) which was applied to illustrate the demographic characteristics of the elderly people participated; and to explain the distribution of levels of the quality of life according to their demographic characteristics.

Chi² was used to find out the significant association between demographics characteristics and the levels of the quality of life; Pearson correlation was also applied to discover the relationship within the variables.

Results

Table 1 Demographic characteristics of the elderly participated in the study

Gender			Number of sons		
Gender	f	%	Number	f	%
Male	107	68.6%	No sons	19	12.2%
Female	49	31.4%	1-3	38	24.3%
Total	156	100.0%	4-6	75	48.1%
			≥ 7	24	15.4%
Age			Total	156	100.0%
Years	f	%	Occupation		
< 40	۳	1.9%	Occupation	f	%
40-49	۴	2.6%	Employed	56	35.9%
50-59	۲۷	17.4%	Retired	35	22.4%
60-69	۶۹	44.2%	Social Benefit	39	25.0%
≥ 70	۵۳	33.9%	Jobless	26	16.7%
Total	156	100.0%	Total	156	100.0%
Marital Status			Duration of Illness		
Status	f	%	Years	f	%
Married	70	44.9%	≤ 3	36	23.1%
Unmarried	9	5.7%	4-6	37	23.7%
Widowed	61	39.1%	7-9	55	35.3%
Divorced	16	10.3%	≥ 10	28	17.9%
Total	156	100.0%	Total	156	100.0%
Place of recruitment					
Place	F		%		
Nursing Home	18		11.5%		
Outpatient	102		65.4%		
Inpatient	36		23.1%		
Total	156		100%		

f → frequency, % → percentage, ≤ → Equal or less, ≥ → Equal or more

Table (1) shows that 68.6% of the participants are male; 95.4% of them are between 40 and more than 70 years old, about half of them is married (44.9%), 72.5% of them have one to six children, one third is employed (35.9%), 77.0% of those participants has duration of illness four years and more, and 65.4% are recruited from Outpatient.

Table 2. Distribution of the Sample according to place of recruitment

		Place of Recruitment						Total		
		Nursing Homes		Outpatient		Inpatients				
		f	%	F	%	f	%	f	%	
Demographic Characteristics	Gender	Male	14	8.9%	73	46.8%	20	12.8%	107	68.6%
		Female	4	2.6%	29	18.6%	16	10.3%	49	31.4%
		Total	18	11.5%	102	65.4%	36	23.1%	156	100.0%
	Age	< 40	0	0.0%	1	0.6%	2	1.3%	3	1.9%
		40-49	0	0.0%	3	1.9%	1	0.6%	4	2.6%
		50-59	1	0.6%	18	11.5%	8	5.2%	27	17.3%
		60-69	10	6.4%	46	29.5%	13	8.3%	69	44.2%
		≥ 70	7	4.5%	34	21.8%	12	7.7%	53	33.9%
		Total	18	11.5%	102	65.4%	36	23.1%	156	100.0%
	Marital Status	Married	2	1.3%	47	30.1%	21	13.5%	70	44.9%
		Unmarried	3	1.9%	2	1.3%	4	2.6%	9	5.8%
		Widowed	10	6.4%	42	26.9%	9	5.8%	61	39.1%
		Divorced	3	1.9%	11	7.1%	2	1.3%	16	10.3%
		Total	18	11.5%	102	65.4%	36	23.1%	156	100.0%
	No. of Kids	No Kids	16	10.3%	2	1.3%	1	0.6%	19	12.2%
		1-3	1	0.6%	28	17.9%	9	5.8%	38	24.4%
		4-6	1	0.6%	56	35.9%	18	11.5%	75	48.1%
		≥ 7	0	0.0%	16	10.3%	8	5.2%	24	15.4%
		Total	18	11.5%	102	65.4%	36	23.1%	156	100.0%
	Occupation	Employed	0	0.0%	37	23.7%	19	12.2%	56	35.9%
		Retired	8	5.2%	19	12.2%	8	5.2%	35	22.4%
		Social Benefit	7	4.5%	28	17.9%	4	2.6%	39	25.0%
		Jobless	3	1.9%	18	11.5%	5	3.2%	26	16.7%
		Total	18	11.5%	102	65.4%	36	23.1%	156	100.0%
	Duration	≤ 3	2	1.3%	22	12.1%	12	7.7%	36	23.1%
		4-6	4	2.6%	26	16.7%	7	4.5%	37	23.7%
		7-9	11	7.1%	33	21.2%	11	7.1%	55	35.3%
≥ 10		1	0.6%	21	13.5%	6	3.9%	28	17.9%	
Total		18	11.5%	102	65.4%	36	23.1%	156	100.0%	

f → frequency, % → percentage, ≤ → Equal or less, ≥ → Equal or more

Table 2 shows that 11.5% (n= 18), 65.4% (n= 102), and 23.1% (n= 36) of the recruited sample are from Nursing Homes, Outpatient, and Inpatient respectively. And the rest of table shows the distribution of the sample according to subcategories for each demographic characteristic.

Table 3 Distribution in levels of quality of life according to the total number of sample

Quality of Life Levels	f	%
Good	17	10.9%
Moderate	52	33.3%
Poor	87	55.8%
Total	156	100%

f → frequency, % → percentage

Table (3) reveals that more than half of participants has a poor level of quality of life (n= 87; 55.8%).

Table 4. Distribution in Levels of QoL according to place of recruitment and association between QoL and the place.

Level of QoL →	Good		Moderate		Poor		Total		CS
Place of recruitment	f	%	f	%	f	%	f	%	
Nursing Home	1	0.6%	1	0.6%	16	10.3%	18	11.5%	<i>P</i> = 0.002 <i>HS</i>
Outpatient	14	8.9%	26	16.7%	62	39.7%	102	65.4%	
Inpatient	2	1.3%	25	16.0%	9	5.8%	36	23.1%	
Total	17	10.9%	52	33.3%	87	55.8%	156	100.0%	

f → frequency, % → percentage, QoL → Quality of Life,

C.S. based on Binomial & Chi-Square test; *HS*: Highly Sig. At $P < 0.01$; *NS*: Non Sig. at $P > 0.05$

Table 4 indicates that just one patient (0.6%) living in Nursing Home has good level of QoL but 39.7% (n= 62) of outpatient have poor level of QoL. There is high significant association between quality of life and place of recruitment (P-value= 0.002).

Table 5. Distribution in the levels of quality of life according to Gender and association between gender and levels of QoL.

Gender	Quality of Life Levels						Total		CS
	Good		Moderate		Poor		f	%	
	f	%	f	%	f	%			
Male	13	8.3%	39	25.0%	55	35.3%	107	68.6%	<i>P</i> = 0.501 <i>NS</i>
Female	4	2.6%	13	8.3%	32	20.5%	49	31.4%	
Total	17	10.9%	52	33.3%	87	55.8%	156	100.0%	

f → frequency, % → percentage, QoL → Quality of Life,

C.S. based on Binomial & Chi-Square test; *HS*: Highly Sig. At $P < 0.01$; *NS*: Non Sig. at $P > 0.05$

Table (5) demonstrates that about one third of participants who has a poor level of quality of life is male (n= 55; 35.3%), and there is no association between gender and quality of life (P-value = 0.501).

Table 6. Association and Distribution in the levels of quality of life according to age

Age	Quality of Life Levels						Total		CS
	Good		Moderate		Poor		f	%	
	f	%	f	%	f	%			
< 40	0	0.0%	1	0.6%	2	1.3%	3	1.9%	P= 0.295 NS
40-49	0	0.0%	1	0.6%	3	1.9%	4	2.6%	
50-59	3	1.9%	8	5.2%	16	10.3%	27	17.3%	
60-69	8	5.2%	22	14.1%	38	24.4%	69	44.2%	
≥ 70	5	3.2%	20	12.8%	28	17.9%	53	33.9%	
Total	17	10.9%	52	33.3%	87	55.8%	156	100.0%	

f → frequency, % → percentage,

C.S. based on Binomial & Chi-Square test; HS: Highly Sig. At $P < 0.01$; NS: Non Sig. at $P > 0.05$

Table (6) describes that more than third of participants who has a moderate quality of life is within 50-59 years-old age ($n = 10$; 37.0%), and there is no association between age and quality of life (P-value = 0.295).

Table 7. Association and Distribution in the levels of quality of life according to marital status

Marital Status	Quality of Life Levels						Total		CS
	Good		Moderate		Poor		f	%	
	f	%	f	%	f	%			
Married	6	3.9%	23	14.7%	41	26.3%	70	44.9%	P= 0.385 NS
Unmarried	0	0.0%	1	0.6%	8	5.2%	9	5.8%	
Widowed	5	3.2%	23	14.7%	33	21.2%	61	39.1%	
Divorced	6	3.9%	5	3.2%	5	3.2%	16	10.3%	
Total	17	10.9%	52	33.3%	87	55.8%	156	100.0%	

f → frequency, % → percentage,

C.S. based on Binomial & Chi-Square test; HS: Highly Sig. At $P < 0.01$; NS: Non Sig. at $P > 0.05$

Table (7) reveals that more than half of participants who has a moderate quality of life is married ($n = 15$; 55.6%), and there is no association between marital status and quality of life (P-value = 0.385).

Table 8. Association and Distribution in the levels of quality of life according to number of kids

Number of Kids	Quality of Life Levels						Total		CS
	Good		Moderate		Poor				
	f	%	f	%	f	%	f	%	
No Kids	4	2.6%	7	4.5%	8	5.2%	19	12.2%	P= 0.689 NS
1-3	4	2.6%	18	11.5%	16	10.3%	38	24.4%	
4-6	7	4.5%	21	13.5%	47	30.1%	75	48.1%	
≥ 7	2	1.3%	6	3.9%	16	10.3%	24	15.4%	
Total	17	10.9%	52	33.3%	87	55.8%	156	100.0%	

f → frequency, % → percentage,

C.S. based on Binomial & Chi-Square test; HS: Highly Sig. At $P < 0.01$; NS: Non Sig. at $P > 0.05$

Table (8) demonstrates that more than two fifth of participants who has a moderate quality of life has 4-6 children ($n = 11$; 40.7%) and the same proportion for those who have ≥ 7 children, and there is no association between number of children and quality of life (P -value = 0.689).

Table 9. Association and Distribution in the levels of quality of life according to occupation

Occupation	Quality of Life Levels						Total		C.S.
	Good		Moderate		Poor				
	f	%	f	%	f	%	f	%	
Employed	12	7.7%	20	12.8%	24	15.4%	56	35.9%	P= 0.683 NS
Retired	3	1.9%	14	8.9%	18	11.5%	35	22.4%	
Social Benefit	2	1.3%	15	9.6%	22	14.1%	39	25.0%	
Jobless	0	0.0%	3	1.9%	23	14.7%	26	16.7%	
Total	17	10.9%	52	33.3%	87	55.8%	156	100.0%	

f → frequency, % → percentage,

C.S. based on Binomial & Chi-Square test; HS: Highly Sig. At $P < 0.01$; NS: Non Sig. at $P > 0.05$

Table (9) describes that more than two fifth of participants who has a moderate quality of life is retired ($n = 11$; 40.7%), and there is no association between occupation and quality of life (P -value = 0.683).

Table 10. Distribution in the levels of quality of life according to duration of illness

Duration of Illness	Quality of Life Levels						Total		CS
	Good		Moderate		Poor				
	f	%	f	%	f	%	f	%	
≤ 3	8	5.2%	12	7.7%	16	10.3%	36	23.1%	P= 0.701 NS
4-6	6	3.9%	13	8.3%	18	11.5%	37	23.7%	
7-9	3	1.9%	26	16.7%	26	16.7%	55	35.3%	
≥ 10	0	0.0%	1	0.6%	27	17.3%	28	17.9%	
Total	17	10.9%	52	33.3%	87	55.8%	156	100.0%	

f → frequency, % → percentage,

C.S. based on Binomial & Chi-Square test; HS: Highly Sig. At $P < 0.01$; NS: Non Sig. at $P > 0.05$

Table (10) reveals that more than two fifth of participants who has a moderate quality of life has 7-9 years as a duration of illness ($n = 11$; 40.7%), and there is no association between duration of illness and quality of life (P -value = 0.701).

Discussion

1. Discussion of demographic characteristics

According to the results of the table (1), 68.6% of the participants are male and 31.4% are female. These findings do not represent the real percentage of the gender within the elderly people inflicted with Parkinson's disease in Iraq due to the high percentage of women inflicted with this disease neither reside in the elderly Nursing Homes nor attend to governmental hospital because some families, as a tradition, do not send their elderly first relatives to such places, other families are afraid of stigma or the shame. Some studies agree with this result: a study achieved in 2006 which found that 64% of participants were male⁽¹⁸⁾; and 66.4% in another study achieved in 2010⁽¹⁹⁾.

In regard to the age of the elderly participated, the study indicates that the average of age is about 60 years. Several studies in different times agreed with this result such as: in 2011 the age average was 62 years⁽²⁰⁾; in 2007 the average age of this study was 66 years; and the other study in 2010 the average of the age was 63 years⁽²¹⁾.

For the marital status of those participants the study indicates that 44.9% of the participants are married. In 2010 a study confirmed this result⁽²³⁾. And for the duration of Parkinson's disease the study shows that about 76.9% of participants have average of duration of seven years, this result is supported by a study achieved in 2006⁽²⁴⁾.

Regarding the occupation of the participants the study shows that 83.3% of those elderly people have income because they are either employed, retired or has social benefits, unfortunately there are limited researches which concluded the occupation of elderly people who inflicted with Parkinson's disease. For the present study, 35.9% of participants are employed so this because 21.8% of them are within the age of employment (in Iraq is less than 63 years). In addition, quarter of participants has

governmental benefit which is considered a common situation in Iraq because there are a few opportunities to work nowadays.

2 Discussion of levels of the quality of life and its association with some demographic characteristics

According to the revelation of the study in regard to the levels of quality of life for the elderly people a considerable consequence is found that Parkinson's disease has a significant impact on the quality of life of people inflicted with this disease (table 3). More than half of those people have poor quality of life which is considered a high percentage compared with other studies at other places around the world: a study in 2012 declared that 32% of the sample were rated as poor quality of life⁽²⁵⁾; and in 2010 two studies revealed that about 21% of the elderly people inflicted with PD had a poor level of Quality of Life^(26,27).

This high percentage of poor level of quality of life could be as a result to the places where the sample was recruited. For instance, the bad living circumstances in Nursing Homes could contribute to the poor level of quality of life. In addition, the elderly people who are jobless or have low social benefits may give reasonable cause for this poor level.

3 Discussion of levels of QoL in regard to place of recruitment

Table 4 indicates that 17 (10.9%) individuals from the whole sample (n= 156) have good level of quality of life and are distributed as following: one person is in Nursing Homes; 14 (8.9%) persons are from outpatient and two (1.3%) are from inpatient. This could be because the elderly people with PD who live with their families are more comfortable and have good healthy circumstances than those who reside in Nursing Home and/ or inpatient.

Recommendation

According to the results of this study, it is recommended to improve the health and social circumstances in the elderly Nursing Homes

and to add more social and recreational activities within the settings of these Homes, in addition supervising their conditions and treatment by the specialists.

References

- 1- Jankovic J. "Parkinson's disease: clinical features and diagnosis". J. Neurol. Neurosurg. Psychiatr. 2008; 79 (4): pp. 368-376.
- 2- Samii A, Nutt JG, Ransom BR. "Parkinson's disease". Lancet 363 (9423): 2004; pp.1783-1793.
- 3- Banich MT, Compton RJ. "Motor control". Cognitive neuroscience. Belmont, CA: Wadsworth, Cengage learning, 2011; pp. 108-44.
- 4- Longmore, M.; Wilkinson, I. B.; Turmezei T, Cheung CK. **Oxford Handbook of Clinical Medicine**. Oxford University Press. 2007; p. 486.
- 5- Cooper G, Eichhorn G, Rodnitzky RL. "Parkinson's disease". In Conn PM. Neuroscience in medicine. Totowa, NJ: Humana Press, 2008; pp. 508-512.
- 6- Armstrong RA. "Visual signs and symptoms of Parkinson's disease". Clin. Exp. Optom. 2008; 91 (2): pp. 129-38.
- 7- Russell JA, Ciucci MR, Connor NP, Schallert T. "Targeted exercise therapy for voice and swallow in persons with Parkinson's disease". Brain Res. 2010; 1341: pp. 3-11.
- 8- Caballol N, Martí MJ, Tolosa E. "Cognitive dysfunction and dementia in Parkinson disease". Mov. Disord. 2007; 22 (Suppl 17).
- 9- Rodriguez-Oroz MC, Jahanshahi M, Krack P, et al. "Initial clinical manifestations of Parkinson's disease: features and pathophysiological mechanisms". Lancet Neurol. 2009; 8 (12): pp. 1128-39.
- 10- O'Sullivan S B, Schmitz TJ. "Parkinson's Disease". Physical Rehabilitation (5th Ed.). Philadelphia: F.A. Davis. 2007; pp. 856-7.
- 11- Yao SC, Hart AD, Terzella MJ. "An evidence-based osteopathic approach to Parkinson disease". Osteopathic Family Physician. 2013;5(3):pp.96-101.
- 12- Peto V, Jenkinson C, Fitzpatrick R. PDQ-39: a review of the development, validation, and application of a Parkinson's disease quality of life questionnaire and its associated measures. Journal of Neurology. 1998; 24 (1): S10-S14.
- 13- Barichella M, Cereda E. "Major nutritional issues in the management of Parkinson's disease". Mov. Disord. 2009; 24(13):pp.1881-1892.
- 14- Opara J. Current possibilities of evaluation of quality of life in Parkinson disease. Neurol Neurochir. 2003; Pol; 37 Suppl 5: pp. 241-250.
- 15- Muslimovic D, Post B, Speelman JD, et al. Determinants of disability and quality of life in mild to moderate Parkinson's disease. Neurology. 2008; 70, 23: pp. 2241-2247.
- 16- Lyons KE, Pahwa R. The impact and management of non-motor symptoms of Parkinson's disease. American Journal of Managed Care, 2011; 17 (13), S308-14.
- 17- Opara J. Current possibilities of evaluation of quality of life in Parkinson disease. Neurol Neurochir Pol. 2003; 37 Suppl 5: pp. 241-250.
- 18- Frazier L, Marsh L. Coping. In Psychiatric Issues in Parkinson's Disease: A Practical Guide (eds. Menza and Marsh). Taylor & Francis: 2006; United Kingdom.
- 19- Politis M, Wu K, Molloy S, Bain P, Chaudhuri KR, Piccini P. Parkinson's disease symptoms: the patient's perspective. Movement Disorders. 2010; 25 (11), pp. 1646-1651.
- 20- Lyons KE, Pahwa R. The impact and management of nonmotor symptoms of Parkinson's disease. American Journal of Managed Care, 2011; 17 (13), S308-314.
- 21- Wertheimer J, Smith J, Trepatschko V, Kramer R, Wherry J, Walton C, Tuchman M. Differential impact of coping styles on quality of life for individuals with Parkinson's disease with and without deep brain stimulation. 2007; *The Parkinson Alliance website*.
- 22- Shulman LM. Understanding disability in Parkinson's disease. Movement Disorders, 2010. 25 (1), S131-135.
- 23- St George RJ, Nutt JG, Burchiel K J, Horak FB. A meta-regression of the long-term effects of deep brain stimulation on balance and gait in PD. Neurology, 2010; 75 (14), pp. 1292-1299.
- 24- Chaudhuri KR, Martinez-Martin P, Schapira AH V, Stocchi F, et al. International Multicenter Pilot Study of

- the First Comprehensive Self-Completed Non-motor Symptoms Questionnaire for Parkinson's Disease: The NMS Quest Study.** *Movement Disorders*, 2006; Vol. 21, No. 7, p. 916-923.
25. Tuchman M. **Quality of Life and Attitude in Individuals with Parkinson's Disease with and without Deep Brain Stimulation.** Parkinson Alliance. DBS-STN. Org. Improving the Quality of Life in the DBS-STN Community. 2012; P. 1-12.
26. Zhao YJ, Wee HL, Chan YH, Seah SH, et al. **Progression of Parkinson's disease as evaluated by Hoehn and Yahr stage transition times.** *Movement Disorders*, 2010; 25(6), 710-716.
27. Karlsen HK, Larsen JP, Tandberg E, Maeland JG. **Influence of clinical and demographic variables on quality of life in patients with Parkinson's disease.** *J Neurol Neurosurg Psychiatry* 1999; 66: p. 431-435.
28. Tandberg E, Larsen JP, Nessler EG, et al. **The epidemiology of Parkinson's disease in the county of Rogaland, Norway.** *Mov Disord*, 1995; (10):p. 541–549.