revista de pesquisa ISSN 2175-5361

CUIDADO É FUNDAMENTAL

Escola de Enfermagem Alfredo Pinto – UNIRIO

RESEARCH DOI: 10.9789/2175-5361.rpcfo.v16.13064

CLINICAL FUNCTIONAL VULNERABILITY AND HEALTH CONDITIONS OF ELDERLY PEOPLE WITH PARKINSON'S DISEASE

Vulnerabilidade clínico funcional e condições de saúde de idosos com Doença de Parkinson

Vulnerabilidad clínica funcional y condiciones de salud de personas mayores con enfermedad de Parkinson

Alcimar Marcelo do Couto[1]

Carolina Sales Galdino[2]

Sonia Maria Soares[3]

ABSTRACT

Objective: to characterize the clinical-functional vulnerability and health conditions of elderly people with Parkinson's in a specialized care service in a large Brazilian city. **Method:** this is a documentary, cross-sectional study, carried out with 230 elderly people diagnosed with Parkinson's disease. Patient records were evaluated focusing on the instruments: Functional Clinical Vulnerability Index-20 and the multidimensional assessment Care Plan. Statistical analyzes were carried out using the R software. **Results:** predominance of elderly people between 80 and 89 years old, female and with low education. The main markers of clinical-functional vulnerability were mobility impairment, urinary incontinence, sarcopenia, gait/falls, mood disorder, multiple comorbidities and polypharmacy. **Conclusion:** the findings showed a high prevalence of functional impairment in Parkinson's disease. It is believed that the results can contribute to improving care for this population, enabling nursing professionals to work to promote self-care.

DESCRIPTORS: Parkinson disease; Aged; health vulnerability; International classification of functioning, Disability and health; Nursing;

[1,2,3] Federal University of Minas Gerais School of Nursing, Minas Gerais, Belo Horizonte, Brazil.

Received: 18/01/2024; Accepted: 30/01/2024; Published online: 23/03/2024

Corresponding Author: Alcimar Marcelo do Couto alcimar.couto@ebserh.gov.br

How cited: Couto AM, Galdino CS, Soares SM. Clinical functional vulnerability and health conditions of elderly people with Parkinson's disease. *R Pesq Cuid Fundam* [Internet]. 2023 [cited year mouth day];16:e13064. Available from:

https://doi.org/10.9789/2175-5361.rpcfo.v16.13064

RESUMO

Objetivo: caracterizar a vulnerabilidade clinico funcional e as condições de saúde de idosos com Parkinson de um serviço de atenção especializada de um município de grande porte brasileiro. **Método:** trata-se de um estudo documental, transversal, realizado com 230 idosos com diagnóstico de Doença de Parkinson. Foram avaliados os prontuários dos pacientes com enfoque nos instrumentos: Índice de Vulnerabilidade Clínico Funcional-20 e o Plano de Cuidados da avaliação multidimensional. As análises estatísticas foram realizadas utilizando o software R. **Resultados:** predomínio de idosos entre 80 e 89 anos, sexo feminino e baixa escolaridade. Apresentaram como principais marcadores de vulnerabilidade clinico funcional o comprometimento da mobilidade, incontinência urinária, sarcopenia, marcha/quedas, distúrbio de humor, comorbidade múltipla e polifarmácia. **Conclusão:** os achados mostraram alta prevalência de comprometimento funcional na doença de Parkinson. Acredita-se que os resultados possam contribuir na melhoria do cuidado a essa população, possibilitando aos profissionais da enfermagem atuarem na promoção do autocuidado.

DESCRITORES: Doença de parkinson; Idoso; Vulnerabilidade em saúde; Classificação internacional de funcionalidade, Incapacidade e saúde; Enfermagem;

RESUMEN

Objetivos: caracterizar la vulnerabilidad clínico-funcional y las condiciones de salud de personas mayores con Parkinson en un servicio de atención especializada de una gran ciudad brasileña. **Método:** se trata de un estudio documental, transversal, realizado con 230 personas mayores diagnosticadas con Enfermedad de Parkinson. Se evaluaron los expedientes de los pacientes centrándose en los instrumentos: Índice de Vulnerabilidad Clínica Funcional-20 y Plan de Cuidados de la evaluación multidimensional. Los análisis estadísticos se realizaron mediante el software R. **Resultados:** predominio de personas mayores entre 80 y 89 años, del sexo femenino y con baja escolaridad. Los principales marcadores de vulnerabilidad clínico-funcional fueron la alteración de la movilidad, la incontinencia urinaria, la sarcopenia, la marcha/caídas, los trastornos del estado de ánimo, las comorbilidades múltiples y la polifarmacia. **Conclusión:** los hallazgos mostraron una alta prevalencia de deterioro funcional en la enfermedad de Parkinson. Se cree que los resultados pueden contribuir para mejorar la atención a esta población, permitiendo a los profesionales de enfermería trabajar para promover el autocuidado.

DESCRIPTORES: Enfermedad de parkinson; Anciano; Vulnerabilidad en salud; Clasificación internacional del funcionamiento, de la discapacidad y de la salud; Enfermería.

INTRODUCTION

Parkinson's disease (PD) is the second most prevalent of the chronic degenerative and disabling diseases in the elderly.[1-2] Today, around 6.1 million people live with the disease worldwide, and by 2030 it could reach more than 8 million people.[3] The 2016 Global Burden of Disease Risk Factor Study pointed out that, among neurological disorders, PD is considered to be the fastest growing in terms of prevalence, disabilities and deaths over the years.[4-5]

The main motor symptoms in PD are bradykinesia, rigidity, resting tremors and postural instability, as well as non-motor symptoms associated with a decrease in catecholamines and serotonin, such as sleep disorders, hypotension and intestinal changes such as constipation. In the advanced stage, changes can occur in the neurocortex and, consequently, lead to cognitive disorders and dementia.[1]

As a result, people with PD can be physically and socially vulnerable, since their functionality can be affected.[6] Performing a functional assessment of elderly people with PD is essential in order to know the real care needs of these individuals and subsequently develop care technologies to provide excellent healthcare.[7]

Therefore, knowing the living and health conditions and assessing the main determinants of clinical and functional vulnerability of the elderly with PD is a fundamental element for guiding health professionals in drawing up a care plan based on their frailties, identifying the clinical and functional dimensions affected and consequently indicating self-care actions and multidisciplinary interventions, with an emphasis on nursing, with the aim of maintaining, delaying further declines or rehabilitating the functional capacity of the elderly with PD, enabling them to become the protagonists of care.[7]

In view of the above, this study aimed to characterize the clinical-functional vulnerability and health conditions of elderly people with Parkinson's disease in a specialized care service in a large Brazilian municipality.

METHOD

This is a cross-sectional, retrospective study, with secondary analysis of data from the medical records and care plans of the elderly, in a time frame, referring to the years 2018 and 2019, in which a convenience sample was used, composed of elderly people with Parkinson's Disease seen at a Reference Center for Elderly Health in Belo Horizonte, Brazil, which provides care to the elderly referred by Primary Health Care (PHC) units.

In this study, medical records were analyzed, initially for the first care given to the elderly by professionals trained in the application of a comprehensive geriatric assessment, using the Clinical Functional Vulnerability Index-20 (CFVI-20) and the care plan, which contains a summary of the assessment of the elderly.

The data from the medical records was collected by the first author who works at the Reference Center and two duly trained scientific initiation fellows, from October to December 2021, referring to the care provided in 2018 and 2019.

During this period, 10,399 patients underwent a multidimensional assessment, 9,202 of whom had their care plan drawn up following this assessment and were then referred via email to PHC.

To make up the sample for this study, we selected medical records that met the eligibility criteria: patients with a clinically confirmed diagnosis of Parkinson's disease and who had completed the IVCF-20 instrument. Patients with records of parkinsonism that was not classified as Parkinson's disease or who were still being followed up to determine the cause of the parkinsonism were excluded. Based on these criteria, the study sample consisted of 230 patients with PD.

For data collection, we used the Care Plan, drawn up for all elderly people referred for multidimensional assessment at the Geriatrics Service of the Specialized Care Centre.

In order to screen for frailty, the IVCF-20 instrument was initially used in the assessment of the elderly, as it is an interdisciplinary screening instrument that covers multidimensional aspects of the health condition of individuals aged 60 and over 8 and then the Comprehensive Geriatric Assessment (CGA) with all its instruments and scales.

The data obtained from the care plans/patient records was entered and stored in a spreadsheet in the Microsoft Office Excel® 2010 program, according to the coding determined for each of the variables of interest to the study. To build the database, we opted for the double entry validation technique, i.e. double typing to detect possible inconsistencies. Once the databases had been validated, the data was imported into the R software, version 4.0.0, to process the analyses.

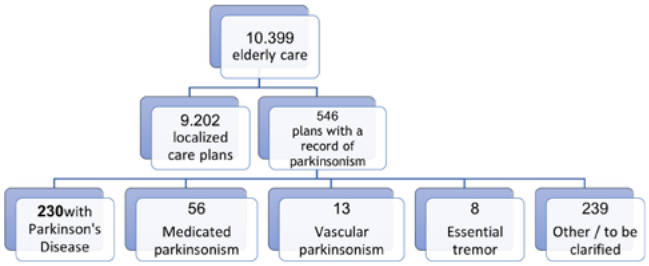
The variables used in this study are related to sociodemographic, clinical and functional clinical vulnerability issues. Absolute and relative frequencies were calculated for the categorical variables. For the quantitative variables, the Shapiro Wilk Normality test was carried out, which indicated non-normality. As a result, the median and quartiles were used.

The project complied with the recommendations of Resolutions n.466/2012 and n.510/2016 of the National Health Council and was approved by the Research Ethics Committee of the Federal University of Minas Gerais through Consubstantiated Opinion n.4.294.594 of 23/09/2020.

RESULTS

In the evaluation of the care plans/patient records of the elderly, a total of 546 elderly people were initially selected with a report of the presence of parkinsonism, corresponding to a prevalence of 5.93% of parkinsonism in the population evaluated. Of these, 230 elderly people had a diagnosis of PD confirmed clinically and recorded in their medical records, corresponding to a prevalence of 2.50% in this population.

Figure 1 - Final study sample



The distribution of clinical-functional vulnerability markers, degree of dependence in Instrumental and Basic Activities of Daily Living, clinical-functional classification and classification of frail elderly with PD is shown in Table 2.

Table 3 shows the distribution of the variables motor and non-motor manifestations according to the clinical functional classification of the elderly with PD.

Table 1 - Distribution of sociodemographic variables of elderly people with Parkinson's Disease treated at the Mais Vida Center, Belo Horizonte/MG, 2021

Variables	n	Median (Q1 - Q3)
Age	230	80 (73 - 85)
Age group	n	%
60 to 69 years old	33	14,3
70 to 79 years old	76	33,0
80 to 89 years old	102	44,3
90 years or older	19	8,3

Gender		
Male	106	46,1
Female	124	53,9
Education (n = 224)		
Did not study	46	20,5
1 to 4 years	130	58,0
5 to 8 years	19	8,5
9 to 11 years	22	9,8
Over 11 years old	7	3,1

*Variables with n indicated in front were answered by the total described. The others have the reference of 230 participants

Among the motor manifestations, the cardinal signs of the disease (postural instability, tremor, bradykinesia and rigidity) were highly prevalent. The most frequent non-motor manifestations described in the medical records were urinary, mood and sleep disorders.

The clinical characterization of the elderly with PD is shown in Table 4.

DISCUSSION

In Brazil, epidemiological studies on the incidence and prevalence of parkinsonism and PD are still scarce. An important population--based cross-sectional study to assess the prevalence of PD and parkinsonism carried out in Brazil was the Bambuí study 9 which showed a prevalence of parkinsonism of 7.2% in the population aged

Table 2 - Distribution of clinical-functional vulnerability variables of elderly people with Parkinson's Disease treated at the Mais Vida Center, Belo Horizonte/MG, 2021

Variables	n	Median (Q1 - Q3)
IVCF-20 score	230	20 (14 - 26)
Clinical and functional vulnerability markers - IVCF-20	n	%
Age	142	61,7
Self-perception of health (fair or poor)	163	70,9
Instrumental Activities of Daily Living - IADL	169	73,5
Basic Activities of Daily Living - BADL	97	42,2
Cognition	168	73,0
Humor	160	69,6
Mobility	214	93,0
Upper limbs (MMSS)	32	13,9
Sarcopenia	154	67,0
Gait/Falls	175	76,1
Continence	150	65,2
Communication	63	27,4
Vision	46	20,0
Hearing	26	11,3
Multiple Comorbidities	159	69,1
Polypathology	59	25,7
Polypharmacy	135	58,7
Recent hospitalization	29	12,6
Functional Clinical Classification		
Robust	19	8,3
Risk of Fragilization	40	17,4
Fragile	171	74,3
Classification Activities of Daily Living Instrumental (AVDI)		
Independence	42	18,3
Partial dependence	89	38,7

Complete dependence	99	43,0
Classification Activities of Daily Living (AVDB)		
Independence	123	53,5
Semi-dependence	59	25,7
Incomplete dependence	35	15,2
Complete dependence	13	5,7
Classification of the frail elderly (n = 171)		
Low complexity	40	23,3
High Complexity	128	74,9
Final stage of life	3	1,8

*Variables with n indicated in front were answered by the total described. The others have the reference of 230 participants

over 64, with PD being the most frequent cause, accounting for 3.3% of the total sample.

In this study, the majority of elderly people diagnosed with PD were female and had little schooling. These results are corroborated by other studies [6-7,10-12] which also found a predominance of elderly women with low levels of education in their samples. Unlike other studies [6,13] which found a predominance of males in their samples. PD usually appears between the ages of 50 and 80, with a peak in the seventh decade of life.[1]

This epidemiological pattern may reflect the importance of certain environmental and social factors related to the incidence of PD and its interaction with other variables, such as genes, hormone levels, the effects of pregnancy and different professions or environmental exposures.[1]

The distribution of the sample according to age in this study shows that PD predominates in the older age groups. PD is known to preferentially affect people aged over 50, of both sexes, and its incidence and prevalence increase with advancing age.[3]

According to the markers of clinical and functional vulnerability assessed in this study, the elderly were more likely to have the following markers: mobility, gait/falls, dependence on IADLs, cognition and regular or poor self-perceived health.

Table 3 - Distribution of motor and non-motor manifestations according to the clinical-functional classification of the elderly with Parkinson's Disease seen at the Mais Vida Center, Belo Horizonte/MG, 2021

Variables / clinical-functional classification	**Fragility**					
Motor Manifestations	Not fragile (n = 59)		Fragile (n = 171)		Total (n =230)	
	n	%	n	%	n	%
Tremors	41	87,2%	99	71,7%	140	75,7%
Rigidity	25	53,2%	107	77,5%	132	71,4%
Bradykinesia	34	72,3%	101	73,2%	135	73,0%
Freezing	1	1,9%	16	10,5%	17	8,3%
Postural instability	33	55,9%	134	78,4%	167	72,6%
Speech	11	18,6%	60	35,1%	71	30,9%
Excessive salivation	2	3,4%	14	8,2%	16	7,0%
Chewing / swallowing	6	10,2%	59	34,5%	65	28,3%
Writing (micrography)	1	1,7%	2	1,2%	3	1,3%

Non-motor manifestations						
Cognitive disorder	11	18,6%	104	60,8%	115	50,0%
Mood Disorder / Depression	31	52,5%	128	74,9%	159	69,1%
Hallucinations and delusions	3	5,1%	41	24,0%	44	19,1%
Anxiety	14	23,7%	31	18,1%	45	19,6%
Apathy	2	3,4%	28	16,4%	30	13,0%
Fatigue	3	5,1%	15	8,8%	18	7,8%
Sleep disorder	28	50,9%	99	61,5%	127	58,8%
Urinary disorder	29	49,2%	132	77,2%	161	70,0%
Postural Hypotension	11	18,6%	27	15,8%	38	16,5%
Constipation	18	30,5%	72	42,1%	90	39,1%
Pain	11	18,6%	46	26,9%	57	24,8%

*Variables with n indicated in front were answered by the total described. The other variables have the reference of 230 participants.

Table 4 - Distribution of clinical variables according to the clinical-functional classification of elderly people with Parkinson's Disease seen at the Mais Vida Center, Belo Horizonte/MG, 2021.

Variables / clinical-functional classification	**Fragility**					
	Not fragile		Fragile		Total	
Staging (n = 227)	n	%	n	%	n	%
Lightweight	29	50,0%	16	9,5%	45	19,8%
Moderate	25	43,1%	62	36,7%	87	38,3%
Grave	4	6,9%	91	53,8%	95	41,9%
Diagnostic time median (Q1 - Q3)	2 (0 - 6,5)		4 (1 - 9)		4 (0 - 8)	
Uses Prolopa (n = 212)						

No	1	1,9%	8	5,1%	9	4,2%
Yes	53	98,1%	150	94,9%	203	95,8%
Taking another medication Antiparkinsonian (n = 212)						
No	44	81,5%	125	79,1%	169	79,7%
Yes	10	18,5%	33	20,9%	43	20,3%
Type of other medication Antiparkinsonian (n = 43)						
Pramipexole	5	50,0%	16	48,5%	21	48,8%
Entacapone	2	20,0%	10	30,3%	12	27,9%
Amantadine	2	20,0%	2	6,1%	4	9,3%
Pramipexol + entacapone	1	10,0%	4	12,1%	5	11,6%
Pramipexol + Amantadine	0	0,0%	1	3,0%	1	2,3%

*Variables with n indicated in front were answered by the total described. The other variables have the reference of 230 participants.

These findings show that most of the elderly have mobility as a marker of frailty, followed by gait/falls, a finding similar to the literature[14] which identified that the greater the impairment caused by PD, the higher the rate of falls and difficulty moving, reinforcing the changes in mobility in people with PD. Another study[15] showed that 53% of the elderly had [2-3] falls a month, and the associated factors were the stage of the disease, postural instability, changes in mobility and continence. In the present study, postural instability and incontinence were also highly prevalent vulnerability markers in the elderly with PD.

Sarcopenia was identified in a cross-sectional study as a condition present in a large proportion of elderly people with PD and when compared to the general elderly population, it is more commonly found. It was associated with greater motor impairment, falls, dementia and reduced quality of life.[16]

In the mood vulnerability marker, almost 70% of the elderly showed alterations, a finding similar to that of a study[15] which also found a relationship between impairment in activities of daily living and/or the presence of sleep behavior disorders, especially REM sleep, both of which can be used to identify the onset of depression.

Depressive symptoms are statistically significantly related to cognitive impairment.[17] In the present study, most of the elderly showed altered cognition in the assessment of the vulnerability markers of the IVCF-20. This finding shows that PD is also associated with cognitive impairment and not just motor symptoms. Dementia associated with PD can affect 80% of patients in the long term. [1]

Self-perception of health is an important marker for assessing health conditions and quality of life, since the way people deal with their health can determine their decisions, the way they live and their lifestyle, making it a predictor of frailty and death. Negative evaluations of health have an impact on self-care and the way in which health is taken care of, and can lead to isolation and impaired mood.[18-19] In this study, the majority of elderly people rated their self-perception of health as fair or poor and showed impaired mood, in line with the findings in the literature.

The loss of independence to carry out tasks such as looking after oneself and managing one's own life results in functional decline. Depending on the degree of complexity, these tasks are classified into basic, instrumental and advanced activities of daily living (ADLs). The impairment of these ADLs is related to the impairment of functional systems such as cognition, mood, mobility and communication.[20]

A study on functional decline and associated factors in the elderly found that functional dependence was associated with: female gender, being over 80 years old, hospitalizations and chronic diseases. Chronic diseases, due to their progression and the importance of the relationship between increasing age and functional capacity, can lead

to limitations in the daily lives of the elderly, resulting in the need for a person to help with activities of daily living.[7]

The Visual Frailty Scale is an alternative way of assessing frailty syndrome, as it evaluates mobility, other disabilities, the socio-family context and comorbidities. According to the scale, frail elderly people are those with established functional decline and unable to manage their lives due to the presence of single or multiple disabilities. They have a varying degree of dependence on instrumental and basic ADLs.[20]

According to the visual frailty scale, this study found a high prevalence of highly complex frail elderly people, i.e. elderly people with potential for functional gain and/or quality of life, and a low prevalence of end-of-life classification. This assessment is extremely important for establishing the proportionality of promotion, prevention, treatment and rehabilitation actions. [20]

The most prevalent motor manifestations found in this study were tremor, rigidity and bradykinesia, a result similar to that found in a study 21 which reported that these findings are mainly present in the first five years of PD diagnosis, unlike freezing and postural instability which are observed later.

In the present study, it was observed that most of the elderly had non-motor symptoms, mainly cognitive disorder, mood disorder, sleep disorder and urinary disorder. Non-motor symptoms and motor complications are responsible for a significant part of functional impairment in PD, and should therefore be identified and treated. Identifying these manifestations makes it possible to improve the clinical care offered, monitor the progression of the disease and contribute to the quality of life of people with Parkinson's and their families.[1]

The diagnosis time of the sample studied was between one and five years, followed by less than one year. According to the degree of disability of the Hoehn and Yahr Staging, most of the elderly people with PD were in the severe stage of disability (grade 4 and 5) and were classified as frail on the visual frailty scale. The Hoehn and Yahr staging assesses the disability of individuals with PD and is able to indicate their general condition quickly and practically.[21]

The therapeutic interventions currently available only have the capacity to improve the symptoms of the disease, with clearly higher efficacy in motor manifestations. Levodopa was the first drug to be used effectively for the treatment of PD and, more than 50 years after its introduction, it still remains the most effective in the treatment of motor symptoms.1 In the present study, more than 90% of elderly people with PD use levodopa as a pharmacological treatment.

CONCLUSION

It is important to consider some of the limitations of this study, including the fact that it was a cross-sectional study with documentary analysis, investigating a single sample group made up of patients in more advanced stages of the disease at a specialized secondary health care center.

Females, low levels of schooling and older age groups were found to be prevalent, with a PD diagnosis time of between one and five years. Most of the elderly with PD had poor or regular self-perceived health, dependence on IADLs, changes in cognition, mood and sleep disorders. Mobility impairment due to sarcopenia, altered gait, postural instability, falls and urinary incontinence was the functional domain with the greatest impairment. Most of the elderly are highly complex frail people with a high chance of functional gain.

The findings of the study showed that functional impairment is very prevalent and can have an impact on the quality of life of elderly people with PD, since the performance of tasks that are part of daily life and the possibility of living and caring for oneself independently at home are compromised. These impacts also affect their emotional and social well-being, and their care configuration, as they start to need care from family members, friends or professional caregivers.

It is believed that the results can contribute to improving care for elderly people with PD and their families, by identifying the socio-demographic and clinical-functional profile of these elderly people, enabling nursing professionals to act in a way that contributes to promoting self-care and assertively providing guidance and education to patients, their families and caregivers.

REFERENCES

1. Cabreira V, Massano J. Doença de Parkinson: Revisão Clínica e Atualização. Acta med. port. [Internet]. 2019 [acesso em 18 de abril 2022];32(10). Disponível em: https://doi.org/10.20344/amp.11978.

2. Chou KL. Diagnosis and differential diagnosis of Parkinson disease. UpToDate. [Internet]. 2020 [cited 2022 apr 18]. Available from: https://www.uptodate.com/contents/diagnosis-and-differential-diagnosis-of-parkinson-disease.

3. Pinheiro JES, Barbosa MT. Doença de Parkinson e Outros Distúrbios do Movimento em Idosos. In: Freitas, E. V. D.; PY, L. Tratado de Geriatria e Gerontologia. 4.ed. Rio de Janeiro: Guanabara Koogan, 2018. p. 360-370.

4. Dorsey ER, Elbaz A. 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. [Internet]. 2018 [cited 2022 apr 25];17(11). Available from: https://doi.org/10.1016/S1474-4422(18)30295-3.

5. Rieder CR. Canabidiol na doença de Parkinson. Brazilian Journal of Psychiatry (São Paulo. 1999. Online), 1809-452X. [Internet]. 2020 [acesso em 16 de maio 2022];42(2). Disponível em: https://doi.org/10.1590/1516-4446-2019-0810.

6. Leandro LA, Teive HAG. Fatores associados ao desempenho funcional de idosos portadores da Doença de Parkinson. Rev. Kairós. [Internet]. 2017 [acesso em 18 de abril 2022];20(2). Disponível em: https://revistas.pucsp.br/index.php/kairos/article/view/2176-901X.2017v20i2p161-178.

7. Baptista R, Alvarez AM, Nunes SFL, Valcarenghi RV, Barbosa SFF. Idosos com Doença de Parkinson: perfil e condições de saúde. Enferm. Foco. [Internet]. 2019 [acesso em 16 de maio 2022];10(5). Disponível em: https://doi.org/10.21675/2357-707X.2019.v10.n5.2604.

8. Moraes EN, Carmo JA, Lanna FM, Azevedo RS, Machado CJ, Montilla DER. Clinical-Functional Vulnerability Index-20 (IVCF-20): Rapid recognition of frail older adults. Rev. saúde pública. [Internet]. 2016 [cited 2022 apr 20];50:81. Available from: https://doi.org/10.1590/S1518-8787.2016050006963.

9. Barbosa MT, Caramelli P, Maia DP, Cunningham MCQ, Guerra HL, Lima-Costa MF, Cardoso F. Parkinsonism and Parkinson's disease in the elderly: A community-based survey in Brazil (the Bambuí study). Movement Disorder. [Internet]. 2006 [cited 2022 may 16];21. Available from: https://doi.org/10.1002/mds.20806.

10. Hirsch L, Jette N, Frolkis A, Steeves T, Pringsheim T. The incidence of Parkinson's disease: a systematic review and meta-analysis. Neuroepidemiology. [Internet]. 2016 [cited 2022 apr 18];46(4). Available from: https://doi.org/10.1159/000445751.

11. Ribas CG, Silva LA, Corrêa MR, Teive HG, Valderramas S. Effectiveness of exergaming in improving functional balance, fatigue and quality of life in Parkinson's disease: A pilot randomized controlled trial. Parkinsonism relat. disord. [Internet]. 2017 [cited 2022 may 16];38. Available from: https://doi.org/10.1016/j.parkreldis.2017.02.006.

12. Díez-Cirarda M, Ojeda N, Peña J, Cabrera-Zubizarreta A, Jiménez LO, Gómez-Esteban JC et al. Long-term effects of cognitive rehabilitation on brain, functional outcome and cognition in Parkinson's disease. Eur. j. neurol. [Internet]. 2018 [cited 2022 apr 18];25(1). Available from: https://doi.org/10.1111/ene.13472.

13. Fernandes I, Filho AS. Estudo clínico-epidemiológico de pacientes com Doença de Parkinson em Salvador-Bahia. Rev. bras. neurol. psiquiatr. [Internet]. 2018 [acesso em 16 de abril 2022];22(1). Disponível em: https://www.revneuropsiq.com.br/rbnp/article/view/244/141.

14. Baptista R, Alvarez AM, Nunes SFL, Valcarenghi RV, Pascoal LM. Idosos com Doença de Parkinson: avaliação ao comprometimento e da capacidade funcional. Rev baiana enferm. [Internet]. 2019 [acesso em 18 de abril 2022];33:e28103. Disponível em: https://doi.org/10.18471/rbe.v33.28103.

15. Peball M. et al. Prevalence and Associated Factors of Sarcopenia and Frailty in Parkinson's Disease: A Cross-Sectional Study. Gerontology. [Internet]. 2019 [cited 2022 may 18];65(3). Available from: https://doi.org/10.1159/000492572.

16. Alvarado-Bolaños A, Cervantes-Arriaga A, Arredondo-Blanco K, Salinas-Barboza K, Isais-Millán S, Rodríguez-Violante M. Falls in persons with Parkinson's disease: Do non-motor symptoms matter as much as motor symptoms? Arq. Neuropsiquiatr. [Internet]. 2019 [cited 2022 may 20];77(11). Available from: https://doi.org/10.1590/0004-282X20190148.

17. Aguiar IM, et al. Associação dos sintomas depressivos com o comprometimento da memória episódica em pacientes com a doença de Parkinson. J. bras. psiquiatr. (Online), 1982-0208. [Internet]. 2020 [acesso em 18 de maio 2022];69(4). Disponível em: https://doi.org/10.1590/0047-2085000000291.

18. Gomes MMF, Paixão LAR, Faustino AM, Cruz RCS, Moura LBA. Marcadores da autopercepção positiva de saúde de pessoas idosas no Brasil. Acta Paul. Enferm. (Online). [Internet]. 2021 [acesso em 18 de maio 2022];34. Disponível em: http://dx.doi.org/10.37689/acta-ape/2021AO02851.

19. Carneiro JA, Gomes CAD, Durães W, Jesus DR, Chaves KLL, Lima CA. Autopercepção negativa da saúde: prevalência e fatores associados entre idosos assistidos em centro de referência. Ciênc. saúde coletiva (Online), 1678-4561. [Internet]. 2020 [acesso em 20 de maio 2022];25(3). Disponível em: https://doi.org/10.1590/1413-81232020253.16402018.

20. Gualberto MT et al. Fragilidade de Idosos Atendidos em Ambulatório de Geriatria segundo a Escala Visual de Fragilidade. Geriatr., Gerontol. Aging (Online). [Internet]. 2019 [acesso em 18 de maio 2022];13(1). Disponível em: https://doi.org/10.5327/Z2447-211520191900002.

21. BalestrassiI LS, Silva SMC. Descriptive epidemiological study on patients with movement disorders, with emphasis on Parkinson's disease. Med J. [Internet]. 2021 [cited 2022 may 20];139(1). Available from: https://doi.org/10.1590/1516-3180.2020.0119.r1.30102020.