Impact of pain on quality of life in patients with parkinson's disease: a comprehensive clinical analysis

Impacto da dor na qualidade de vida de pacientes com doença de Parkinson: uma análise clínica abrangente

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ABSTRACT

Background: Pain is a prevalent non-motor symptom in Parkinson's disease (PD) and has a substantial negative impact on patients' quality of life. However, the complexity and multidimensionality of pain in PD are often underrecognized in clinical practice. This study aimed to investigate the relationship between pain and quality of life in individuals with PD through a comprehensive clinical analysis.
Methods: A cross-sectional study was conducted involving 30 patients with a confirmed diagnosis of Parkinson's disease, who were being followed at a specialized neurology outpatient clinic. Participants underwent structured clinical interviews, neurological examinations, and were assessed using validated scales, including the King's Parkinson's Disease Pain Questionnaire, the McGill Pain Questionnaire, and the PDQ-39 to evaluate quality of life. Descriptive and inferential statistical analyses were applied to explore the association between pain characteristics and quality of life domains.
Results: The most frequently reported type of pain, affecting 80% of participants, was musculoskeletal and neuropathic in origin. The presence and severity of pain correlated significantly with worse scores in the mobility, emotional well-being, and bodily discomfort domains of the PDQ-39.
Conclusions: Pain in PD presents diverse clinical manifestations and is strongly associated with impaired quality of life. These findings underscore the need for systematic pain assessment and tailored management strategies in PD care.

Keywords: Parkinson disease; Pain; Indicators of Quality of Life; Activities of Daily Living; Health Status Indicators; Pain Clinics.

RESUMO

Introdução: A dor é um sintoma não motor prevalente na doença de Parkinson (DP) e exerce impacto negativo substancial na qualidade de vida dos pacientes. No entanto, a complexidade e a multidimensionalidade da dor na DP são frequentemente subestimadas na prática clínica. Este estudo teve como objetivo investigar a relação entre dor e qualidade de vida em indivíduos com DP por meio de uma análise clínica abrangente.
Métodos: Foi realizado um estudo transversal envolvendo 30 pacientes com diagnóstico confirmado de doença de Parkinson, acompanhados em um ambulatório especializado em neurologia. Os participantes foram submetidos a entrevistas clínicas estruturadas, exames neurológicos e avaliados por meio de escalas validadas, incluindo a King's Parkinson's Disease Pain Questionnaire, o Questionário de Dor de McGill e o PDQ-39 para avaliação da qualidade de vida. Análises estatísticas descritivas e inferenciais foram aplicadas para explorar a associação entre as características da dor e os domínios da qualidade de vida.
Resultados: O tipo de dor mais relatado, com 80% entre participantes, foi de origem musculoesquelética e neuropática. A presença e a gravidade da dor correlacionaram-se significativamente com piores escores nos domínios de mobilidade, bem-estar emocional e desconforto corporal do PDQ-39.
Conclusões: A dor na doença de Parkinson apresenta manifestações clínicas diversas e está fortemente associada ao comprometimento da qualidade de vida. Esses achados reforçam a necessidade de avaliação sistemática da dor e de estratégias de manejo individualizadas no cuidado de pacientes com DP.

Palavras-chave: Doença de Parkinson; Dor; Indicadores de Qualidade de Vida; Atividades de Vida Diária; Indicadores do Estado de Saúde; Clínicas da Dor.

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Study Site: The present study was conducted among patients diagnosed with Parkinson's disease at the Policlínica Metropolitana UEPA in Belém, Pará. This medium-complexity outpatient unit, affiliated with the State University of Pará, offers more than 20 specialties, as well as diagnostic tests and minor procedures, and serves as a reference center for the diagnosis of neurological and cardiological diseases in the state of Pará.

INTRODUCTION

Parkinson's disease (PD) is a chronic and progressive neurodegenerative disorder characterized by the degeneration of dopaminergic neurons in the substantia nigra pars compacta, leading to a reduction in dopamine levels[1]. This dopaminergic deficit is primarily responsible for the hallmark motor symptoms of the disease, including bradykinesia, resting tremor, rigidity, and postural instability[2].

PD is the second most common neurodegenerative condition among individuals over the age of 65, surpassed only by Alzheimer's disease. Its prevalence can reach up to 5% in this population, particularly among those with a family history, sedentary lifestyle, or exposure to environmental toxins[3]. As the global population ages, the public health impact of PD continues to increase[2].

Beyond motor dysfunction, PD encompasses a wide range of non-motor symptoms that are often underrecognized but substantially affect quality of life. These include sensory deficits such as hyposmia and visual impairment, neuropsychiatric symptoms like depression and dementia, and, notably, pain—a frequent and disabling complaint among PD patients[4,5].

Pain in PD can manifest as musculoskeletal, neuropathic, or central pain, arising from both central mechanisms, such as dopamine depletion, and peripheral mechanisms, including sensory nerve degeneration. It is estimated to affect up to 60% of individuals with PD and has been identified as one of the most burdensome non-motor symptoms, significantly impairing quality of life[6].

Pain interferes with sleep, exacerbates mood disorders, and further compromises daily functioning[7]. Chronic pain in PD is often associated with emotional distress, social withdrawal, and reduced engagement in everyday activities[8]. The persistent discomfort and loss of functional autonomy can lead to frustration, irritability, and sleep disturbances, contributing to a vicious cycle of physical and psychological deterioration[9].

Understanding the multifaceted impact of pain in PD is essential for developing effective, patient-centered interventions. Addressing pain is not solely about symptom control, but about restoring the individual's overall well-being through comprehensive, multidisciplinary approaches that integrate physical, emotional, and social support[7]. Managing pain in PD is thus not only a clinical priority but also a humanistic imperative to ensure dignity and quality of life. Accordingly, this study aimed to conduct a to explore how different dimensions of pain affect the quality of life in patients with Parkinson's disease.

MATERIALS AND METHODS

1. Ethical aspects

This study was conducted in accordance with international ethical guidelines for research involving human subjects. The protocol was approved by the Institutional Ethics Committee under opinion number 7.184.526, CAAE 83744124.4.0000.5174.

2. Study design

An exploratory, descriptive, cross-sectional study with a quantitative approach was performed. The research included patients diagnosed with Parkinson's disease treated at a clinic linked to a Brazilian university. This medium complexity outpatient clinic, linked to a State University, offers over 20 medical specialties and serves as a regional reference center for neurological and cardiological diagnoses.

3. Study population and inclusion criteria

A non-probabilistic convenience sampling method was employed to include 30 individuals with a confirmed diagnosis of Parkinson's disease, all of whom were receiving regular geriatric-neurological care at a specialized outpatient clinic during the data collection period. Participants were eligible if they had a diagnosis of Parkinson's disease and reported any type of pain, regardless of its duration or the stage of the disease. Patients who were not properly registered in the institution's follow-up program during the study period, as well as those who declined participation or withdrew consent at any stage, were excluded.

4. Data collection and analysis

Data collection took place from January to June 2025 via face-to-face administration of a semi-structured questionnaire containing open-ended, closed, and Likert-scale items assessing the level of agreement. The questionnaire was based on validated scales: King's Parkinson's Disease Pain Questionnaire (KPDPQ)[10], McGill Pain Questionnaire[11], and the Parkinson's Disease Questionnaire-39 (PDQ-39)[12]. The questionnaire was divided into three sections: (1) sociodemographic data; (2) physical pain assessment; and (3) evaluation of pain impact on functionality.

Data were analyzed using descriptive and inferential statistics, according to the nature of the variables. Qualitative variables were presented as absolute and relative frequencies, and quantitative variables were summarized by measures of central tendency and dispersion (mean, standard deviation, minimum, and maximum values).

For the analysis of associations between categorical variables, Pearson's Chi-square or Fisher's exact test was used, depending on the sample size in each cell. The Student's t-test was applied to compare the means of continuous variables between two independent groups. In cases of non-parametric distributions or ordinal variables, the Mann-Whitney U test was used for comparisons between two groups, and the Kruskal-Wallis test followed by the Dwass-Steel-Critchlow-Fligner post-hoc test was used for comparisons involving more than two groups.

The data were tabulated using Microsoft Excel 2019®, and graphs were generated using GraphPad Prism® 9.2. Statistical analyses were performed with GraphPad Prism® 9.2 and Jamovi 2.6.45, and results with $p \leq 0.05$ (two-tailed) were considered statistically significant.

5. Instruments

King's Parkinson's Disease Pain Questionnaire (KPDPQ)[10]

The KPDPQ is a Parkinson's disease-specific instrument designed to characterize different types and patterns of pain. It assesses seven domains: musculoskeletal pain, chronic pain, fluctuating (intermittent) pain, nocturnal pain, orofacial pain, pain associated with discoloration/edema, and radicular pain. Pain severity is scored from 0 to 3, and frequency from 0 to 4, providing a detailed profile of pain experience and its relationship with motor and non-motor symptoms.

McGill Pain Questionnaire (Adapted)[11]

The Portuguese-adapted McGill Pain Questionnaire evaluates multidimensional aspects of pain through 15 descriptors encompassing sensory and affective qualities. Participants indicate the presence of each descriptor and rate intensity on a scale from 0 (none) to 3 (severe). Indices derived include:

- NWC (Number of Words Chosen): 0–15, indicating pain quality diversity
- PRI-T (Pain Rating Index – Total): 0–45, overall pain intensity
- PRI-S (Pain Rating Index – Sensory): 0–33, sensory pain dimension
- PRI-A (Pain Rating Index – Affective): 0–12, affective pain dimension

Parkinson's Disease Questionnaire-39 (PDQ-39)[12]

The PDQ-39 assesses health-related quality of life across eight domains: mobility, activities of daily living, emotional well-being, stigma, social support, cognition, communication, and bodily discomfort. Responses are scored from 0 (never) to 4 (always), with domain scores converted to a 0–100 scale; higher scores indicate greater impairment.

The McGill Pain Questionnaire used in this study corresponded to the culturally adapted and validated Brazilian Portuguese version. This version has been previously validated for use in clinical and research settings in Brazil, demonstrating adequate reliability and construct validity for pain assessment.

The characterization of pain subtypes, including radicular pain and pain associated with discoloration, edema, or swelling, was based on the domains of the KPDPQ. These pain patterns were identified through structured patient interviews in which participants reported the presence, location, and characteristics of their pain according to the standardized items of the instrument.

RESULTS

The study included 30 patients diagnosed with Parkinson's disease. The predominant profile consisted of male participants (53%; n = 16), with a mean age of 65 years. Most were married (60%; n = 18), of mixed race (73%; n = 22), Catholic (53%; n = 16), and had completed high school (37%; n = 11). Regarding marital status, in addition to married individuals, 27% were single (n = 8), 10% widowed (n = 3), and 3% divorced (n = 1). As for ethnicity, 17% (n = 5) identified as white and 10% (n = 3) as Black. In terms of religious affiliation, 30% of the participants (n = 9) identified as Evangelical, while the remaining 70% adhered to other beliefs or reported no religious affiliation.

Regarding educational level, in addition to high school graduates, 30% (n = 9) had completed elementary school. Most participants (60%; n = 18) reported engaging in regular physical activity. Alcohol consumption was reported by only 7% (n = 2), and none of the participants reported tobacco use. The mean time since Parkinson's disease diagnosis was 6.57 years, with a standard deviation of ±5.84 years.

The KPDPQ was used to assess the types and patterns of pain. Musculoskeletal pain was the most frequently reported type (90%; n = 27), followed by fluctuating pain and nocturnal pain (both 87%; n = 26). Persistent chronic pain and radicular pain were present in 83% (n = 25) of the cases. Clinical signs such as discoloration, edema, or swelling were reported in 63% of participants (n = 19), whereas orofacial pain was the least prevalent, occurring in 20% (n = 6). Regarding pain intensity, the mean scores (± standard deviation) for each domain

were as follows: Fluctuating Pain (10.5 ± 10.1), Nocturnal Pain (7.37 ± 6.03), Radicular Pain (6.5 ± 4.49), Musculoskeletal Pain (6.1 ± 4.3), Chronic Pain (5.83 ± 4.5), Discoloration/Edema/Swelling (4.47 ± 5.47), and Orofacial Pain (1.93 ± 4.98). Total KPDPQ scores ranged from 9 to 99, with a mean of 42,7 (±26.7).

To analyze the relationships among the different pain categories assessed by the KPDPQ, Spearman's correlation test was used due to the non-parametric distribution of the data (Table 1). The analysis revealed positive and statistically significant correlations among several domains. Chronic pain showed a moderate correlation with both musculoskeletal pain ($r = 0.587$; $p < 0.001$) and radicular pain ($r = 0.512$; $p = 0.004$). Similarly, fluctuating pain was correlated with musculoskeletal pain ($r = 0.477$; $p = 0.008$) and chronic pain ($r = 0.497$; $p = 0.005$). Radicular pain also correlated with musculoskeletal pain ($r = 0.371$; $p = 0.044$) and nocturnal pain ($r = 0.541$; $p = 0.002$). In contrast, the orofacial pain domain and pain associated with discoloration, edema, or swelling did not show statistically significant correlations with most other types of pain.

Table 1. Spearman's correlation coefficients among pain domains of the KPDPQ in participants with Parkinson's disease (n = 30).

Pain Type	Musculoskeletal	Chronic	Fluctuating	Nocturnal	Orofacial	Discoloration, Edema/Swelling	Radicular
Musculoskeletal	—						
Chronic	r = 0.587 p < 0.001	—					
Fluctuating	r = 0.477 p = 0.008	r = 0.497 p = 0.005	—				
Nocturnal	r = 0.336 p = 0.070	r = 0.315 p = 0.090	r = 0.312 p = 0.094	—			
Orofacial	r = 0.026 p = 0.893	r = 0.202 p = 0.286	r = 0.101 p = 0.597	r = 0.184 p = 0.331	—		
Discoloration, Edema/Swelling	r = 0.037 p = 0.846	r = 0.138 p = 0.467	r = 0.293 p = 0.116	r = 0.332 p = 0.073	r = 0.243 p = 0.196	—	
Radicular	r = 0.371 p = 0.044	r = 0.512 p = 0.004	r = 0.343 p = 0.063	r = 0.541 p = 0.002	r = −0.027 p = 0.887	r = 0.168 p = 0.374	—

To assess pain qualities, the adapted McGill Pain Questionnaire was used. On average, patients (n = 30) selected 8.57 descriptors (NWC), with a median of 9. The total pain score (PRI-T) had a mean of 17.93, ranging from 7 to 35. The sensory component (PRI-S) was the main contributor to the total score, with a mean of 12.9, while the affective component (PRI-A) had a mean of 5.03. Stratification of total pain intensity (PRI-T) revealed that 16 patients (53.33%) reported moderate pain and 14 (46.67%) reported mild pain.

The PDQ-39 questionnaire was applied to assess the impact of the disease across various quality-of-life domains. The mean scores (± standard deviation), in descending order of impairment, were: Mobility (76.58 ± 25.55), Activities of Daily Living (67.91 ± 27.81), Bodily Discomfort (61.80 ± 19.64), Emotional Well-being (54.86 ± 27.16), Stigma (50.56 ± 30.73), Communication (36.39 ± 26.67), Cognition (29.87 ± 16.74), and Social Support (15.83 ± 21.26).

A Spearman correlation analysis was performed between the PDQ-39 domains. Significant correlations were observed between Mobility and Activities of Daily Living ($\rho = 0.696$; $p < 0.001$), Activities of Daily Living and Emotional Well-being ($\rho = 0.547$; $p = 0.002$), and Emotional Well-being and Stigma ($\rho = 0.514$; $p = 0.004$). The Communication domain showed significant correlations with both Mobility ($\rho = 0.637$; $p < 0.001$) and Activities of Daily Living ($\rho = 0.627$; $p < 0.001$), among others (Table 2).

In a comparative analysis, the cluster of motor domains (Mobility and Activities of Daily Living) had a mean score of 72.58% and a median of 79.16%, while the cluster of non-motor domains had a mean of 49.62% and a median of 47.92%.

Table 2. Spearman's correlation coefficients among PDQ-39 quality-of-life domains in participants with Parkinson's disease (n = 30).

Domain	Mobility	Activities of Daily Living	Emotional Well-being	Stigma	Social Support Deficiency	Cognition	Communication
Mobility	—						
Activities of Daily Living	r = 0.696 p < 0.001	—					
Emotional Well-being	r = 0.274 p = 0.143	r = 0.547 p = 0.002	—				
Stigma	r = 0.385 p = 0.036	r = 0.500 p = 0.005	r = 0.514 p = 0.004	—			
Social Support Deficiency	r = −0.192 p = 0.308	r = 0.043 p = 0.823	r = 0.146 p = 0.443	r = 0.279 p = 0.135	—		
Cognition	r = 0.097 p = 0.609	r = 0.253 p = 0.178	r = 0.283 p = 0.130	r = 0.412 p = 0.024	r = 0.255 p = 0.175	—	
Communication	r = 0.637 p < 0.001	r = 0.627 p < 0.001	r = 0.372 p = 0.043	r = 0.489 p = 0.006	r = −0.075 p = 0.694	r = 0.328 p = 0.076	—
Bodily Discomfort	r = 0.203 p = 0.283	r = 0.274 p = 0.143	r = 0.388 p = 0.034	r = 0.155 p = 0.413	r = 0.191 p = 0.312	r = 0.302 p = 0.105	

When comparing PDQ-39 scores by sex, men presented higher mean scores in the domains of Mobility (79.43 ± 27.56) and Activities of Daily Living (70.92 ± 27.42) compared to women (68.65 ± 32.54 and 62.77 ± 34.62,

respectively). To assess statistical significance, Student's t-test and the Mann–Whitney U test were applied. Statistically significant differences between sexes were found in the domains of Activities of Daily Living (p = 0.043), Emotional Well-being (p = 0.002), and Stigma (p = 0.019).

Additionally, the influence of disease duration on quality of life (PDQ-39) was analyzed. Patients were categorized into three groups based on time since diagnosis: short (≤ 3 years), intermediate (> 3 and ≤ 9 years), and long (> 9 years)[13,14]. Comparisons were conducted using the Kruskal–Wallis test followed by the Dwass–Steel–Critchlow–Fligner post-hoc test.

The analysis indicated statistically significant differences in the domains of Mobility (p = 0.012) and Communication (p = 0.004). In the Mobility domain, post-hoc testing revealed a significant difference between the short- and long-duration groups (p = 0.013). For the Communication domain, post-hoc analysis identified significant differences between the long-duration group and both the short-duration (p = 0.005) and intermediate-duration (p = 0.020) groups.

Similarly, the influence of disease duration on pain manifestation was investigated by comparing scores across the seven KPDPQ domains among the short-, intermediate-, and long-duration groups. The analysis revealed a statistically significant difference only in the domain of Discoloration, Edema, or Swelling (p = 0.025). For this domain, post-hoc testing indicated that the difference occurred between the short- and intermediate-duration groups (p = 0.023) (Figure 1).

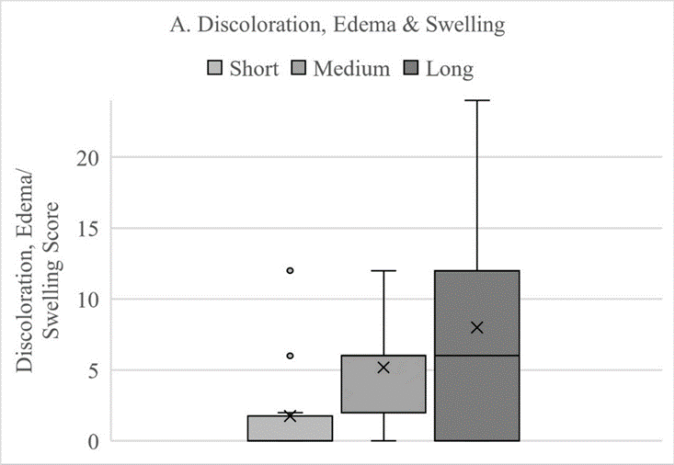

Figure 1. Comparison of KPDPQ scores by duration of Parkinson's disease. The figure displays the only domain that showed a statistically significant difference among groups: Discoloration, Edema, and Swelling. Boxplots indicate the median, interquartile range, and overall distribution of scores for each group.

Finally, a correlation analysis was conducted between the total scores of the three applied scales. The analysis revealed a positive and statistically significant correlation between the sum of KPDPQ domains and the McGill total pain score (PRI-T) (r = 0.607; p < 0.001). Positive correlations were also observed between the KPDPQ sum and the mean PDQ-39 scores (r = 0.491; p = 0.006), as well as between the McGill PRI-T and the mean PDQ-39 score (r = 0.525; p = 0.003).

DISCUSSION

The sample of this study, comprising 30 patients with Parkinson's disease, showed a predominance of males (53%) and a mean age of 64.8 years. This profile is consistent with epidemiological studies indicating that Parkinson's disease predominantly affects older adults, with prevalence increasing substantially after the age of 65 and reaching approximately 1–2% in this age group. Furthermore, several studies report a higher incidence in men compared with women, suggesting possible interactions between genetic, hormonal, and environmental factors influencing disease susceptibility. Most participants self-identified as brown (73%), reflecting the ethnic composition of the Amazon region, and 60% were married, a factor that may favor social support and treatment adherence. The predominant education level was up to high school (67%), associated with lower access to health information and worse outcomes in PD, especially in socioeconomically vulnerable contexts. The high rate of regular physical activity (60%) stands out positively compared to other cohorts, representing a relevant protective aspect for functionality and pain associated with the disease[15].

Pain assessment by the KPDPQ indicated high prevalence and multifactorial nature, with 90% of patients reporting musculoskeletal pain, followed by fluctuating and nocturnal pain (87%), persistent chronic pain (83%), radicular pain (83%), and less frequently orofacial pain (20%). These findings align with international studies reporting up to 85% pain prevalence in PD, with musculoskeletal pain being the most common. Fluctuating pain showed the highest mean intensity (10.5 ± 10.1), associated with motor fluctuations and the "wearing-off" phenomenon. Nocturnal pain (7.37 ± 6.03) may reflect rigidity and postural disorders compromising sleep, worsening fatigue and quality of life[16]. Radicular pain, present in 83%, relates to postural changes and nerve compressions secondary to muscle rigidity, often underestimated but occurring in up to 40–60% of cases. Orofacial pain (20%) is less frequent yet debilitating, linked to facial muscle dysfunction and bruxism in advanced stages[17].

The mean total KPDPQ score (42,7 ± 26.7) reflects a mild to moderate and heterogeneous pain burden, indicating the need for individualized clinical approaches beyond motor control. Pain is an independent predictor of worse quality of life, even adjusted for motor severity[18].

The classification of pain in Parkinson's disease has been further refined by the Parkinson's Disease Pain Classification System (PD-PCS), which provides a structured framework to differentiate pain directly related to Parkinson's disease from pain unrelated to the disorder. The

PD-PCS categorizes pain into distinct subtypes, including musculoskeletal, neuropathic/radicular, dystonic, central pain, and pain associated with motor fluctuations, while also allowing the identification of secondary or unrelated pain conditions[17]. This approach facilitates a more precise clinical characterization of pain mechanisms in PD and supports individualized therapeutic strategies. Although the present study used the KPDPQ to evaluate pain patterns and intensity, the high prevalence of musculoskeletal, fluctuating, and radicular pain observed in our sample is consistent with the subtypes commonly described within the PD-PCS framework, reinforcing the multifactorial nature of pain in Parkinson's disease[18].

The McGill Pain Questionnaire revealed a complex pain experience, with a mean of 8.57 descriptors per patient, highlighting multiple sensory and affective dimensions. The total pain rating index (PRI-T) averaged 17.93, classified as mild to moderate but indicative of clinically underestimated persistent suffering[19]. The sensory component predominated over the affective (PRI-S: 12.9; PRI-A: 5.03); however, 26.67% reported intense affective pain, a value higher than multicenter studies (10–20%), possibly reflecting regional psychosocial factors and public health system limitations[20].

Quality of life assessed by the PDQ-39 showed significant impact on mobility, activities of daily living, and bodily discomfort domains, with pain being a major predictor of poorer quality of life, often surpassing motor symptoms[21]. The "Bodily Discomfort" domain had the highest mean scores, consistent with the high prevalence and intensity of pain. Patients with persistent pain scored worse in up to five domains, especially functional autonomy, mood, and interpersonal relationships[22].

Pain directly interferes with motor capacity and self-esteem, aggravating dependency. The impact on "Emotional Well-being" highlights the bidirectional association between pain and depressive symptoms, mediated by dopaminergic and serotonergic systems[20]. The "Social Support" domain showed moderate impact, related to physical limitations and progressive isolation, mitigated by family and community support. "Cognitive Function" and "Communication" were least affected, possibly due to patients' clinical stage or shorter disease duration, although difficulties in pain communication emphasize the importance of structured instruments[23].

Temporal analysis indicated that patients diagnosed for over 9 years showed greater impairment in mobility and communication domains, reflecting disease progression[21]. Pain related to discoloration, swelling, or edema was significantly higher in intermediate disease duration, suggesting influences of vasomotor changes and immobility. Trends toward increased chronic and musculoskeletal pain over time were observed, although not statistically significant, possibly due to sample size[20].

Positive correlations among KPDPQ, McGill, and PDQ-39 scores confirm the direct relationship between pain and worse quality of life, supporting pain as a determinant factor independent of motor severity[21,24]. Despite the small sample, this study corroborates international data linking pain to up to 40% worse quality of life scores and increased risk of early hospitalization[25]. Multidimensional assessment and systematic pain monitoring are essential to personalize treatment and prevent complications.

However, this study has important limitations. The restricted sample size may limit generalizability. Statistical analysis did not include specific tests for multiple scale domains and lacked a pain-free control group for direct comparison. Future research should be longitudinal, multicentric, and statistically robust, exploring pain evolution and targeted interventions such as analgesic physiotherapy, neuromodulation, cognitive-behavioral psychotherapy, and rational use of analgesics and adjuvants. The results highlight pain as a central symptom in PD, requiring systematic recognition and management in clinical guidelines and public health policies.

Pain perception and its impact on quality of life in Parkinson's disease are influenced by several clinical and therapeutic factors that were not systematically assessed in the present study. Variables such as motor severity (e.g., UPDRS or Hoehn and Yahr staging), the presence of depression or anxiety, sleep disturbances, and the patient's motor state during evaluation (ON or OFF medication) are known to significantly modulate pain perception and functional impairment. Additionally, pharmacological factors, including the levodopa equivalent daily dose (LEDD) and the use of analgesic medications, may also influence both pain intensity and quality-of-life outcomes. The absence of these variables in the current analysis represents a potential source of confounding and should be considered when interpreting the associations observed between pain measures and quality-of-life scores.

Another relevant methodological aspect concerns the identification of neuropathic pain components. Although the KPDPQ allows characterization of several pain patterns in Parkinson's disease, the use of specific screening instruments for neuropathic pain—such as DN4 or painDETECT—could improve the differentiation of pain subtypes. Incorporating such tools in future studies would strengthen the classification of pain mechanisms and facilitate comparisons with structured systems such as the PD-PCS. This approach may contribute to more precise characterization of pain phenotypes and support more targeted therapeutic strategies.

The regional context of the Amazon and the inclusion of patients treated in public outpatient clinics represent relevant aspects of this study. However, the relatively small sample size limits the generalizability of the findings. Socioeconomic factors, including educational level and access to specialized neurological care, may also influence disease management and pain perception. Future studies should further explore these contextual factors to better understand regional differences and support the

development of targeted public health strategies for patients with Parkinson's disease.

CONCLUSION

This study confirms that pain is a prevalent and debilitating symptom in Parkinson's disease, significantly affecting mobility, bodily discomfort, and daily activities, with direct consequences for patients' quality of life and psychological well-being. The findings highlight the urgent need for a more systematic and multidisciplinary clinical approach to pain assessment and management, addressing persistent underreporting and undertreatment. In addition to contributing to the existing literature, the study underscores the importance of improving public health policies and care protocols, and encourages future research with larger samples.

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