



Research Article

Quality of Life survey among men with Parkinson's Disease, Erectile Dysfunction and Lower Urinary Tract Infection Symptoms suggestive of Benign Prostatic Hyperplasia and the analysis of Comorbidities Factors

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Received: 01 December, 2020

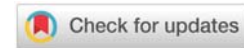
Accepted: 13 March, 2021

Published: 15 March, 2021

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Keywords: Benign prostatic hyperplasia; Erectile dysfunction; Parkinson's Disease; prostate cancer

<https://www.peertechzpublications.com>



Abstract

Purpose: To evaluate the Quality of Life (QoL), overall satisfaction, neurodegenerative dimension, and the role of comorbidities among men diagnosed with Parkinson's disease PD, Erectile Dysfunction (ED) and Benign Prostate Hyperplasia (BPH) in the United States.

Design: This was an online-based, cross-sectional survey study.

Methods: A cross-sectional survey was conducted to obtain men's QoL perception of PD, ED, and BPH. A sample of males (N = 46), 40 years of age or older, completed validated questionnaires divided into three domains: International Index of Erectile Function (IIEF-5), International Prostate Symptom Score (IPSS-8), and Parkinson's Disease Questionnaire (PDQ-39). Chi-Square, and descriptive statistics were used to analyze the data.

Findings: Forty-six men were included. Of the responding men, 17 were Caucasian (37 %) and 16 were black (34%). The mean age of the men was 50.7 years, ranging from 40 to 80 years old. In this group of men, the degree of QoL was mild in 8.7 %, moderate in 27 %, and severe in 50%. Based on the responses to the questions, the severity of the symptoms is considered severe. The BPH symptoms score was 34.3 ± 8.2 ($p < .05$), the PD symptoms score was 157.1 ± 35.6 ($p < .05$), and the ED symptoms score was 13.4 ± 5.8 ($p < .05$).

Conclusion: Comorbidities advances evidence of deterioration of disease with age, meaning that at substantially older ages, comorbid men faced severe QoL associated with bradykinesia, rigidity, tremors, nocturia, and ED. Future work is needed to further assess this association.

Clinical Relevance: This study's findings could be used as evidence to encourage caregivers to initiate fall and QoL precautions for men diagnosed with PD who presents with ED and BPH.

Introduction

Parkinson's Disease (PD) is the most common degenerative movement disorder leading to a progressive loss of neurons or loss of neuron function [1]. The disease affects the basal ganglia and the substantia nigra of the brain. As the condition worsens, men with a history of PD are at increased risk for developing Erectile Dysfunction (ED) and Benign Prostatic Hyperplasia (BPH). Given that PD significantly affects men's ability to live an independent life, there is still a lack of research on the spectrum of fall risks, comorbidities, and men's QoL after diagnosis.

Although ED is defined as the consistent inability to achieve and maintain an erection enough for a sexual encounter, ED is also linked with PD and significantly impacts sexual and psychological health, sexual self-image, and self-esteem [2]. Studies found that PD affects one's autonomic nervous system, which controls sexual response and functioning (Fulbright, *n.d.*). In an epic review, Stern, et al. (2006) noted that men diagnosed with PD commonly report ED. Studies have suggested that up to 60% to 80% of men report difficulty achieving or maintaining a strong erection at the time of initial evaluation. Moreover, some treatment options for BPH can hurt erectile function, while some treatments for PD can hurt ED as well. Previous research by Defreitas, et al. [3] found that urinary tract problems occurred in 27% to 70% of men with PD. In another study, Hely, Morris, Reid, and Trafficante [4] found that men with PD reported spastic bladder from detrusor hyperactivity and involuntary contraction of the bladder, reducing the QoL for patients and caregivers. Information about the strength of these associations and comorbidities is limited.

The null hypothesis is that there is no relationship between PD, ED, BPH, and QoL problems. Currently, no study has investigated the QoL problems associated with ED and BPH in men living with PD in the United States. Most importantly, cross-sectional assessments for functional impairments and QoL issues, and comorbidities have also yet to be investigated in this population. Therefore, the purpose of this cross-sectional online-based study was to evaluate the QoL and well-being, overall satisfaction, perceptions of control, neurodegenerative dimension, and the role of comorbidities and old age among men diagnosed with PD, ED, and BPH in the United States. Understanding the strength of the association and related comorbidities has clear clinical relevance given the ongoing research for the therapeutic effect of health-related QoL management.

Material and methods

Study design

This research is a quantitative survey based on a cross-sectional design. An anonymous survey was posted online using the SurveyMonkey web domain (www.surveymonkey.com). A descriptive survey with general and disease-specific measures is presented. This study used three established, validated tools: IPSS-8, IIEF-5, and PDQ-39.

The populations studied (aged ≥ 40 years) comprises 46 men who self-reported their symptoms and conditions. A cross-sectional survey was conducted to obtain men's QoL perception of PD, ED, and BPH. A sample of males 40 years of age or older completed a validated questionnaire divided into three domains. The possible scores for the IIEF-5 range from 0 to 20, classified into five categories based on the scores: severe (13-20), moderate (6-12), and no ED (1-5), each IIEF-5 question is scored on a five-point ordinal scale where high values represent a poor sexual function. If a respondents' score is between 6 and 20, ED should be addressed. The IIEF-5 questionnaire is in the public domain.

The IPSS-8 survey is based on seven questions concerning urinary symptoms and one question concerning QoL. Each question concerning urinary symptoms allows the participants to choose one out of six responses indicating increasing severity of the symptom. The answers are assigned points from 0 to 5. The total score can range from 0 to 35 (asymptomatic to very symptomatic), mild (symptoms score less than or equal to 7), moderate (symptoms score range 8-19), and severe (symptoms score range 20-35). The IPSS-8 questionnaire was created by the American Urologic Association in 1992.

The PDQ-39 survey was used to gauge the QoL issues associated with been diagnosed with PD PDQ-39 items are grouped into eight scales that are scored by expressing summed items as a score ranging between 0 = no problem to 200 = maximum level of problem. Question types included multiple-choice and Likert-type questions. PDQ-39 data was coded as: 0 = Never; 1 = Occasionally; 2 = Sometimes; 3 = Often and, 4 = Always. Health Outcomes Innovation at Oxford University granted permission to use the PDQ-39.

Inclusion criteria

I utilize the following criteria: 1) Men 40 years and older; 2) English proficiency; and 3) self-identification as non-Hispanic White or non-Hispanic Black and African American.

Exclusion criteria

1) Men < 40 years were excluded from this study; 2) lack of English proficiency, and 3) self-identification as neither non-Hispanic White nor non-Hispanic Black. A respondent with more than one question missing from any questionnaire was excluded from the final data analysis. Imputation was used to account for missing data.

Validity and reliability assessment

Cronbach's alpha was used to measure internal consistency within a questionnaire. A high value shows better internal consistency reliability (Nieswiadomy, 2008). A value > 0.70 is considered a good indicator of internal validity.

Statistical analysis

Categorical data were reported as counts and percentages. Continuous variables were reported as an arithmetic mean and Standard Deviation (SD) with statistical analysis utilizing a 2-sample t-test. Also, the correlation coefficient was used to

measure the strength of the association between two variables; Spearman correlations were used to test the association's strength and direction. A person Chi-square univariate analysis was used to compare binomial variables. Therefore, in this study, if the chi-square test has a p -value that is less than the alpha, I will reject the null hypothesis; if the chi-square test is greater than the alpha, I will fail to reject the null hypothesis. Also, the chi-square was used to find an association between the independent and dependent variables. The dependent variable is nominal. Nominal variables include the level of PD, ED, BPH diagnosis (yes/no), race, and marital status.

In this study, ordinal variables are ranked ordered, exhaustive, and exclusive, while the age group is coded as interval data; each interval is four years. For ordinal variables, the median is reported with range. The median was used because it is relatively resistant to outliers and skewness. Results are expressed as mean \pm SD, or with median and percentiles when required. Also, the \pm SD was used to show the average distance from the mean. A two-tailed, alpha threshold of 0.05 was chosen for statistical significance. Statistical analyses were performed using SPSS statistical software version 25 (IBM Corp).

Sample size

In this study, the selection of the sample is inversely proportional to the effect size. Therefore, the sample size was selected based on the hypothesis testing approach to sample size calculation for reliability, assuming an alpha = 0.05, beta = 0.20 with minimum Cronbach's alpha set at 0.80, and expected Cronbach's alpha set at 0.70 yielding a minimum of 46 men. A small sample is needed since I am anticipating a significant difference. However, it is assumed that there is a higher chance of committing a type two error based on the small sample size.

Type one & type two error

As previously noted, If the p -value in this study is greater than the alpha, I will fail to reject the null; if the p -value is less than the alpha, I will reject the null. Therefore, the alpha level of 0.5 was used to reduce Type 1 error, and the power level of 80% was used to reduce Type 2 error and 20% chances of committing a type two error. I have a 5% chance of a type one error and an 80% chance of correctly rejecting the null hypothesis with an alpha of 0.05 and a power of 80 percent. A sample size of 46 men gives this study adequate power to reject the null hypothesis correctly.

Measures

This study is a quantitative study based on a cross-sectional design utilizing three validated questionnaires. Survey data were collected electronically from completed questionnaires. The survey included questions about the QoL issues associated with PD, the validated IPSS-8 questionnaire to measure urinary function related to an enlarged prostate, and the IIEF-5 sexual questionnaire to measure sexual health. QoL (QoL) items are scored on a scale of 0-6, with six being profoundly terrible.

The IIEF-5 questionnaire is a validated, multidimensional,

and self-administered survey. Information on sociodemographic data, risk factors for ED, and the effect of ED on QoL were measured using the IIEF-5 questionnaire and a sociodemographic form. A score of 0-5 is awarded to each of the five questions that measure the four main domains of male sexual function: erectile function, orgasmic function, sexual desire, and intercourse satisfaction (Rosen, et al. 1997).

The PDQ-39 Parkinson's disease questionnaire was used to measure health status and QoL based on PD symptoms and conditions. The PDQ-39 assesses how often people affected by Parkinson's experience difficulties across eight daily living dimensions, including relationships, social situations, stress, self-care, and communication (parkinsons.org.uk, n.d.). In summary, these tools have been noted as reliable and valid and have been used in numerous studies.

Covariates

Covariates included age, race (white, black, Hispanics, others), and marital status. Other demographic variables included are education, employment status, and income.

Variables definitions

All variables were selected a priori. Sociodemographic variables, including age, comorbidity, race/ethnicity, insurance status, income, were collected from the demographic form. The race was categorized as white, black, Hispanic, and unknown. Insurance status was coded as "Yes" or "No." Also, the income level was coded as 1 = < \$15,000; 2 = between \$15,000 and \$29,999, and 3 = >\$29,999.

Outcome variables

The overall QoL index was the primary dependent variable. Secondary outcome variables included the psychological factors associated with activities of daily living. The dependent variables allow the researcher to determine whether the independent variables affect the outcome.

Explanatory variables

For this study, the exposure variable was the independent variables. It is defined as the variable that is studied to see if it causes a change in the dependent variable. Several independent variables were obtained, including age, men's comorbidities, income, education, ED, BPH, health insurance, and family history of Prostate Cancer (PCA). Independent variables are described using frequency tables for categorical variables and the Mean (M) and Standard Deviation (SD) for continuous variables.

Data collection

I conducted a cross-sectional, Web-based survey with a sample of men 40 years old and above living in the United States. In this study, I employed the use of a quantitative, cross-sectional design to explore the association between demographic variables and the QoL issues associated with ED, PD, and BPH. Data were distributed and collected through an online survey created and housed by Survey Monkey, which

specializes in measuring patients' experiences by using the Internet to reach a wide range of respondents. E-fliers were also posted on social media, such as Facebook, Twitter, and LinkedIn. Data collection occurred from June 2019 through December 2019. The estimated time for completion of the questionnaire was 40 minutes, depending on participants' or caregivers' speed and typing skills (59% response rate). I downloaded the survey from the SurveyMonkey domain into an Excel spreadsheet and then into SPSS software application for coding, recoding, and analysis. I computed and analyzed the scores to identify the respondent's level of QoL issues, including comorbidities factors.

Ethical considerations

The study was in complete agreement with the Declaration of Helsinki and the Health Insurance Portability and Accountability Act (HIPPA) related to the privacy information and individually identifiable health information. All the participants, including caregivers, provided informed consent.

Informed consent

Informed consent was obtained from the participants and their caregivers and indicated an understanding that they can withdraw from the study at any time without penalty. Informed consent was an agreement to participate voluntarily and willingly in the study and was based on full disclosure of what constitutes participation in this study and what will be the risks and benefits of participating in the study. There are no physical risks for participation in the study. Permission from a caregiver replaces that of the participant in accordance with the Declaration of Helsinki. However, if they felt stressed or embarrassed from completing this survey, a toll-free number and email address were provided to contact for counseling. It is stated in the informed consent form that all records in this study were confidential and that only the researcher has complete access to the questionnaires and demographic histories. There is no compensation for taking part in this study.

Sample characteristics

A summary of sociodemographic and clinical characteristics can be found in Table 1. The average age of participants was 50.7 years (range of 40–80years). Participants were majority White (37%), Black (34%), and Hispanics (24%). Most were married ($n = 13$; 28%), were aged >64 years ($n = 31$; 67%), had high school education ($n = 21$; 45%), had some form of insurance ($n = 46$; 100%), had family history of PCA ($n = 31$; 67%), and had screened for PCA in the past year ($n = 44$; 93%). Only 21% ($n = 10$) of the sample had a college education, while 32% had some form of college credits. Nearly 58% of the sample reported that they are retired. The median annual income was within the range of \$15,000 and \$29,999.

Results

Data from 46 respondents demonstrated severe impairment in the extents of sexual satisfaction, urinary problems, and PD, with all three questionnaires showing significant correlations with poor QoL ($p < 0.05$). In this study, the mean score for QoL

was 6 out of a possible 6. The mean score for sexual satisfaction was 3 out of a possible 4 points. Men with PD vs. those diagnosed with BPH had a worse desire, confidence, erections, and satisfaction ($P < 0.05$). BPH mean score are presented in Table 2.

The mean score for BPH symptoms, PD symptoms, and ED symptoms are 34.34 (out of a possible 35), 157.10 (out of a possible 200), and 13.45 (out of a possible 20), respectively. The strongest association was between BPH and ED ($p < .05$). Therefore, in clinical practice, sexual and urinary QoL should be evaluated and treated among men diagnosed with PD who present with urinary or sexual problems. Table 3 shows the respondent's mean score. Thus, the QoL problems were reported as terrible, with a score of 6 out of a possible 6 points. The results indicate a strong association with poor QoL among men in the sample.

The results indicate that PD, ED, and BPH are significantly associated with low QoL among men in the sample. The mean score for feeling depressed was 4 out of a possible 6 points

Table 1: Respondents' sociodemographic characteristics.

Variable	N	%	
Age group	< 44	1	2.2
	44 to 54	4	8.7
	54 to 64	10	21.7
	>64	31	67.4
Race	White or Caucasian	17	37.0
	Black or African American	16	34.8
	Hispanic or Latino	11	23.9
	Another race	2	4.3
Income	Under \$15,000	1	2.2
	Between \$15,000 and \$29,999	7	15.2
	over \$29,999	38	82.6
Marital Status	Married	13	28.3
	Widowed	6	13.0
	Divorced	24	52.2
	single	3	6.5
Education	Graduated from high school	21	45.7
	>college	15	32.6
	Graduated from college	10	21.7
Employment	Employed	5	10.9
	Not employed	5	10.9
	Retired	27	58.7
Caregivers' input	Disabled, not able to work	9	19.6
	Yes	44	95.7
	No	2	4.3

Table 2: Respondents' BPH mean score, standard deviations and N.

	Mean	Std. Dev	N
Not emptying bladder	5.000	1.360	46
Urinate less than every two hours	4.580	1.450	46
Stopped and started urinating	4.710	1.360	46
Difficult to postpone urination	4.950	1.220	46
Weak urinary stream	5.020	1.390	46
Strain to start urination	5.100	1.350	46
Get up at night to urinate	5.060	1.200	46
BPH quality of life	6.000	1.390	46

(Table 4). The Mann-Whitney U Test found QoL differences between race/ethnicity, relationship status, and employment status among men in the study. Black/African American men are more likely than white/Caucasian men to report poor QoL with a mean rank of 15.25 v. 15.82. In contrast, divorced men (mean rank = 19.13) and men who are not able to work (mean rank = 19.33) are more likely than married men (mean rank = 18.77) and retired men (mean rank = 18.22) to report poor QoL issues. Based on the data, there is no statistically significant association between marital status, employment, race, and QoL issues reported by men in the sample ($p > .05$).

Furthermore, assessment of the severity of symptoms in BPH was significantly associated with poor QoL and correlated with ED and PD ($p < .05$). Based on the responses to the IPSS-8 questions, the severity of the symptoms is considered severe. The confidence reported in getting and keeping an erection was extremely low ($1.76 \pm .099$). Additionally, ED is highly prevalent in men over 55, and this condition showed a clear relationship to aging. The most common comorbidity reported was depression, fatigue, PCA, erectile, and urinary problems.

The mean score, and SD of individual symptoms, and their relation to severity of PD, are presented in Table 4. The most frequently reported symptoms were embarrassment (3.7 ± 1.3), impaired handwriting/ typing (4.1 ± 1.22), tying shoelaces (4.1 ± 1.1), getting around the house (4.1 ± 1.1), cutting up food (4.0 ± 1.2), muscle pain/ cramping (3.8 ± 1.2), walking 100 yards (4.1 ± 1.0), and impaired memory (3.6 ± 1.2). These findings suggest that the frontal, parietal, occipital and temporal lobes, including the amygdala and hippocampus, were affected in terms of memory loss. All symptoms were reported more commonly in individuals who reported having PD and ED than those diagnosed with BPH. Based on the data presented, the null hypothesis is rejected.

Discussion

This study was conducted to examine the strength of the association between PD, ED, and BPH at the level of the QoL indicator. Based on the results of the survey, comorbidities such as PCA, ED, BPH, depression, and fatigue were significantly associated with poor QoL. Additionally, this study illustrates the prevalence of tremor, rigidity, and hypokinesia among men in the study. This study also examines the contribution of age and comorbidities to these conditions and the etiology of the relationship. The results indicate that ED is highly prevalent in men over 55 years, and this condition showed a clear connection to aging. The results showed that comorbidities and old age independently affect the QoL for men diagnosed with these conditions.

Table 4: Respondents' PD mean score, standard deviations and N.

	Mean	Std. Dev	N
Leisure activities	4.108	1.100	46
Looking after home,	4.152	1.094	46
Carrying bags of shopping	4.195	1.024	46
Walking half a mile	4.217	1.009	46
Walking 100 yards	4.195	1.087	46
Getting around the house	4.152	1.154	46
Getting around in public	4.239	1.015	46
Someone to accompany you	4.087	1.029	46
Felt frightened or worried	4.239	0.947	46
Confined to the house	4.260	0.905	46
Washing	4.043	1.191	46
Dressing	4.021	1.183	46
Doing up shoelaces	4.108	1.100	46
Writing clearly	4.130	1.222	46
Cutting up food	4.044	1.260	45
Holding a drink	4.043	1.332	46
Felt depressed	4.239	1.138	46
Felt isolated and lonely	4.222	1.165	46
Felt weepy or tearful	4.173	1.216	46
Felt angry or bitter	4.021	1.238	46
Felt anxious	4.065	1.236	46
Felt worried	4.239	1.015	46
Conceal PD	4.152	1.134	46
Eating or drinking in public	4.021	1.220	46
Felt embarrassed having PD	3.711	1.324	46
Worried by people's reaction	3.804	1.343	46
Close personal relationships	3.978	1.273	46
Lacked spouse support	4.260	1.389	46
Lacked family or close friends support	3.739	1.289	46
Fallen asleep during the day	4.043	1.134	46
Concentration	3.847	1.210	46
Felt your memory was bad	3.695	1.297	46
Dreams or hallucinations	3.760	1.336	46
Speech	3.826	1.270	46
Felt unable to communicate	3.760	1.285	46
Felt ignored by people	3.934	1.271	46
Had painful muscle cramps	3.869	1.240	46
Aches and pains in joints	3.913	1.207	46
Felt hot or cold	3.847	1.264	46

Table 3: Respondents' ED mean score, standard deviation and N.

	Mean	Std. Dev	N
Self confidence	1.760	0.992	46
Erections hard enough for penetration	2.934	1.451	46
Maintain erection after penetration	2.913	1.457	46
Maintain erection to completion of intercourse	2.956	1.429	46
Sexual intercourse satisfaction	3.891	1.417	46

One plausible reason for the apparent association between PD and BPH could relate to the normal changes in brain chemistry or the insufficient number of cell receptors for dopamine. In this study, the percentage of men who reported severe sexual problems increased significantly with age ($P < .05$). In other words, I am 95% confident in the results with a 5% chance of type I error. Other studies yield a similar outcome. For example, in the Massachusetts Male Aging Study, researchers tested the association between aging and ED. They found that

the likelihood of mild ED remained constant throughout the study and proved to be statistically significant ($p < 0.0001$) [5]. However, in this study, the ED self-confidence index reported in getting and keeping an erection was extremely low ($1.76 \pm .099$).

The results of this study found that BPH and ED are the most common urinary and sexual problems reported by men diagnosed with Parkinson's disease. Several nonmotor signs such as anxiety, hallucination, sexual dysfunction, and urinary incontinence are significantly associated with PD among men in this study ($P < .05$). These results indicate that motor signs such as gait difficulty, rigidity, and dystonia are associated with PD and ED among men in this sample. The reasons for this finding are unclear. However, one possible explanation is related to the age and cognitive impairment of the respondents. Another possible interpretation is that psychological or physiological impairments among the respondents could deviate from the norm. It is also possible, however, that the presence of comorbidities could be associated with a worse QoL at a younger age, but the evidence is lacking.

Another possible justification for the strength of the association is that QoL could be multifactorial. For instance, Aarsland, et al. [6] found that depression and the ability to tolerate discomfort represent a reliable indicator and one of the most frequent non-motor symptoms occurring in approximately 35% of PD patients. Depression, as well as stress, and anxiety, could be a risk factor for ED. In this study, ED is also associated with urinary problems and QoL issues from an enlarged prostate and old age. This current study found that these conditions significantly impacted the QoL and makes it nearly impossible to live an independent life. In this study, depression is experienced by most men with ED and PD than in those who reported mild BPH. The prevalence of ED and BPH is high in men of all ages and rises significantly in men who reported signs and symptoms of PD in this survey.

This finding differs markedly from a previous study showing a lack of concrete evidence that ED impacts QoL and BPH. One hypothesis for the marked discrepancies between the surveys is that in the present study, caregivers aided the respondents to complete the questionnaires, thus overestimating or underestimating the symptoms. While the link between PD, ED, and BPH is well defined in this study, how these conditions affect the QoL is incompletely understood. One explanation for this finding in the current study may be that the sample includes divorced men without social networks. Another weak but possible explanation is that 45% of men in this study had a high school education, making comprehension of the questionnaire challenging. A second reason may be that the sample reported higher income, which may skew the data negatively. Another weak but feasible explanation is that only 67% of men in this study reported a PCA family history and having PCA. Therefore, it seems reasonable to hypothesize that this concern may impede the comprehension of survey questions given that most of the men ($n = 44$) received caregivers' assistance in filling out the questionnaires.

Although PD is a neurodegenerative disorder due to the

loss of the cell brain or spinal cord that affects dopamine-producing neurons of the brain predominately, this study found an association between the urinary and erectile systems. In this study, however, PD is associated with sexual dysfunction, emotional, tremor, bradykinesia, postural instability, and physical challenges, including a feeling of embarrassment and social isolation. Among men in the sample, these motor and nonmotor symptoms presented significant distress to caregivers and negatively impacted respondent's overall QoL.

Furthermore, there is a statistically significant association between PCA and QoL, between ED and QoL, and between BPH and QoL, and these associations were reflected in the comorbidities reported ($p < .05$). For instance, comorbid men faced a series of conditions, including a weak urinary stream, urinary frequency, hallucinations, impaired memory, and ED. For example, the mean score for QoL was 6 out of a possible 6 points. Based on the responses to the IPSS-8 questions, the severity of the symptoms is considered severe. Gao, et al. [7], reported similar findings. This finding reinforces the importance of comorbidity associated with PD.

Also, men in the study diagnosed with PD reported sexual problems such as erectile dysfunction, dissatisfaction with overall sexual life, premature ejaculation, difficulties reaching orgasm or ejaculating. This finding is consistent with the results reported by Bronner and Royter (2004). The authors found that 68.4% of Men reported ED, 65.1% reported sexual dissatisfaction, about 41% reported signs of premature ejaculation, while difficulties reaching orgasm were reported by 39.5%. These symptoms persist throughout the entire trajectory of the disease leading to frustration, embarrassment, isolation, and helplessness for people living with PD and brings a spectrum of poor QoL and changing roles for caregivers tasked with the demanding role of providing care. The present study's finding reinforces the notion that the shaking of the body or trembling, for example, makes it impossible to maintain an erection firm enough for sexual satisfaction. The results also show a correlation for the disease for a set of variables relating to their urinary problems, sexual dysfunction, and motor skills ($p < .05$).

Also, this study shows that the power of conveying food to the mouth is significantly impeded, bowel movement, including the simple act of walking, is impacted. These findings are not surprising given that the population is aging fast; the number of men diagnosed with PD, ED, and BPH is growing. The treatment mechanism and medication for one condition could significantly affect another condition. These findings are consistent with recent literature. Previous studies have shown that clusters of individual comorbidities impact PD prognosis with decreased QoL problems [2].

Evidence on the impact of comorbidities on the occurrence of ED is sparse. However, the current study found significantly decreased QoL in comorbid men with PD, ED, and BPH, especially in moderately and severely comorbid respondents, and stronger association in men with PCA. Therefore, it is plausible that the comorbidity impact may be high, given that caregivers aided in answering the survey questions. However,

the reasons for such comorbidity's differential are unclear and call for further research. This study also found that BPH is the most common for men between the ages of 45 and 74, with 50% of men between the ages of 51 and 60 affected by comorbidities. It is estimated that approximately 80% of respondents in this study over the age of 75 reported urinary problems associated with an enlarged prostate.

The most common symptoms reported by respondents in the current survey include frequent urination, fatigue, and a weak urine stream. The reason for this finding is unclear; however, some studies noted that improper functioning of the autonomic nervous system, which is responsible for regulating smooth muscle activity, might cause bladder problems in some people with PD. These conditions may lead to diminished sexual functions, including severe ED due to reduced nerve signals to the brain. These findings may be due to confounding factors such as tobacco use, heart disease, and diabetes mellitus.

Therefore, it is plausible that ED may be physical, and a medical problem related to low blood flows into the penis, including smoking, heart disease, and diabetes. One possible explanation is that the respondents might suffer from heart disease or diabetes; thus, reports of severe ED and urinary problems may be warranted but are lacking in this study. Another plausible reason is that damaged nerves, including nitric oxide and other chemical messengers such as a vasoactive intestinal polypeptide, might impede smooth muscle. Also, as reported by men in the sample, the symptoms might be associated with an unknown etiology unrelated to PD or BPH. For instance, among men who self-reported PCA diagnosis, those with ED and PD were more likely to report decreased QoL issues. Thus, this study noted that having BPH was associated with frequent urination and decreased sexual satisfaction and higher odds of developing PD among men in the sample. With this increasing population, mostly in the elderly population, required an appropriate treatment to support the QoL and thus minimize the long-term effect of living with the condition. Health-related QoL encompasses a wide range of experiences and is especially relevant for men with PD.

Interestingly, this research found no associations between PD, ED, BPH, and terrible QoL, based on selected sociodemographic variables, a finding consistent with the results of several extensive cross-sectional studies based on a non-representative population. In other words, this study found no differences between marital status, income, race, and QoL issues reported by men in the sample ($p > .05$).

One of the key findings in this study is that the overall QoL issues associated with the diseases are significant ($p < 0.05$). QoL is a concept that refers to an individual's general well-being, including physical, emotional, and psychological parameters. Approximately 50% of the men in the survey described their QoL as terrible. Similarly, depression, fatigue, pain, and concentration difficulties are the most common comorbidity reported by respondents in the study. This finding is consistent with the results found by Jacob, et al. [8], who reported a significant association between depression and PD. Additionally, the results of this study demonstrated that the

social stigma of been diagnosed with PD, ED, and BPH cannot be ignored and that nursing research should address the role of social factors and that social service agencies should consider the effects of comorbidities, social network or social support when designing intervention processes.

The present study results support the alternative hypothesis that PD, ED, BPH symptoms, and conditions are associated with reduced QoL as expressed by comorbidities reported. Prior studies have described the association as highly significant. For example, Wei, Calhoun, and Jacobsen, and Geo, et al. provided an excellent illustration of the association. In another study, Wei, Calhoun, and Jacobsen [9], noted that although BPH is not a life-threatening condition, the severity of enlarged prostate on the QoL can be significant. In this study, the BPH domain score among respondents is considered severe (severe symptom score range 20–35). The respondents' ED domain score is deemed to be severe (severe symptoms score range 13–20).

Also, Gao, et al. [7], further provided evidence that ED is prevalent among individuals diagnosed with PD in the United States. The authors found that multivariate-adjusted relative risks of Parkinson's disease were 2.7, 3.7, and 4.0 ($p = 0.008$) for men with the first onset of ED comparable to those without ED. Gao, et al. found that men diagnosed with ED were 3.8 times more likely to develop PD during the follow-up than were those with excellent erectile function (relative risk = 3.8, 95% confidence interval: 2.4, 6.0; $p < 0.0001$). Taken together, these findings by Gao, et al. suggest an absolute and relative association with ED patients having a fourfold risk of developing PD. This finding is consistent with the result of the present study. A simple explanation is that men ($n = 44$) in the present study received caregivers' aid in answering the survey, and this assistance might tilt their responses either positively or negatively.

Few prospective studies have been done that were better able to establish a strong association between prostate problems, ED, and PD's QoL issues. Based on the present study's findings, there is a significant association between PD, ED, BPH, and QoL problems. It could be that the penis cannot store enough blood during erection, and nerve signals from the brain or spinal cord do not reach the penis due to PD or surgeries in the pelvic area. It is also possible that these associations and comorbidities can be traced to old age or genetic manifestations, environmental factors, and physiology. Rajfer, et al. [10], reported that veno-occlusive dysfunction from tunica albuginea fibrosis was thought to underlie ED's increased risk. The findings of this study support the notion that BPH is prevalent among older adults. It is the most common diagnosis for men between the ages of 45 and 74, about 50% of men in the U.S. between the ages of 51 and 60 are affected by BPH, and about 90% of U.S. men over the age of 80 are affected. Among older men in this study, BPH can result in lower urinary tract symptoms with QoL impairment [11–13].

Several take-home messages warrant consideration. First, respondents who self-reported the PCA diagnosis also reported a high level of ED, feeling of embarrassment, anxiety, and lack

of concentration, including a feeling of fatigue and dizziness. Second, the magnitude of PD among the sample was most significant in men with ED and depression and least significant in men with BPH. Third, in men who self-reported being diagnosed with PD, most of them reported less independent living skills, bradykinesia, difficulty washing, cooking, tying shoelaces, and risk of falls. Fourth, severe ED symptoms, tremor, bradykinesia, or slow movement and hypokinesia were reported by PD and ED respondents. Lastly, the lowest score reported in getting and maintaining an erection, penetration, and self-confidence is notably remarkable. Neurologic and hemodynamic events might impede penile erection and sexual satisfaction under psychological control. Respondents described their conditions and symptoms as severe; thus, efforts should be made by professional nurses and other trained allied health workers to relieve their pains and symptoms, reduce psychosocial distress, and improve their QoL. Therefore, this study's findings can decrease health care costs, improve caregivers' outcomes, and optimize men's QoL.

Limitations

The important drawbacks of this study should be acknowledged. The small sample size limits this study. Therefore, it does not represent all men who experienced the disease of interest. Due to the small sample size, the risk of type two error remains a significant limitation. Also, cross-sectional studies have limited ability to report an association between the dependent and independent variables.

Furthermore, this study is limited by recall bias because participants and caregivers report the exposure retrospectively. I relied on self-reported data to estimate the QoL issues. Comprehension of a self-administered survey might be affected by many factors such as age, neurocognitive functions, depressive mood, and educational level. This limitation might have introduced misclassification in the exposure that resulted in bias estimated. However, the tools used to measure the variables have been validated in several epidemiological research.

Also, there is the risk of type two error, although such risk was mitigated using various statistical techniques in the study. However, the strength of this study includes the use of validated tools and more reliable statistical methodologies. The caveats to recognize before applying the nursing practice findings are that the results are feasible only when evidence and clinical problems are defined by a diagnostic test such as Magnetic Resonance Imaging, genetic testing, prostate, penile, and testicular ultrasound. Respondents reported stooped posture, dysarthria, bradykinesia, and mood swings. Therefore, nursing care includes monitoring client's swallowing and mobility, range of motion exercise, and fall precautions. As PD worsens, changes in chewing and the risk of aspiration increase.

Conclusion

This study contributes significantly to a body of literature exploring the perceptions and factors that could influence comorbidities among men diagnosed with ED, PD, and BPH.

These results suggest the need to incorporate comorbidities factors into intervention programs, policies, and clinical guidelines. By highlighting the association, this study could serve as an impetus for a greater focus on QoL and fall precautions.

Ethical approval

The study was carried out in accordance with the principles of the Declaration of Helsinki. Respondents included in the study were granted their consent to use their data for scientific studies, provided that their identities are confidential.

About the author

Dr. Ifeanyi N. Malu received his undergraduate and graduate education from the City University of New York. His doctorate is from Walden University Minneapolis where he studied public health epidemiology. He later gained a Diploma in Diagnostic Medical Sonography from Sanford Brown College New York, passed the Sonography Principles & Instrumentation (SPI) examination, and earned the American Registered Diagnostic Medical Sonographer (ARDMS) credential with an Abdominal specialty. His broad experience as a public health professional includes medical imaging, urban policy, and epidemiology.

Dr. Malu is a fully trained Epidemiologist who qualified at Walden University. He has experience in transrectal ultrasound of the prostate and Healthcare-Associated Infections. Also, Dr. Malu has a record of research in kidney and prostate epidemiology and has published many articles in prestigious journals. He is skilled in urology and vascular ultrasound, epidemiology of testicular cancer, Statistical Package for the Social Sciences (SPSS) software application, and Electronic Medical Record including multivariate/logistic regression analysis, Simpson's Paradox trends and Wilcoxon-Mann-Whitney test using SPSS.

Dr. Malu's dissertation research focused on prostate cancer screening intentions, barriers, and innovations. He is currently at work on a textbook about practical Sonography, Epidemiology and Biostatistics for nurses.

References

1. Bronner G, Vodušek DB (2011) Management of sexual dysfunction in Parkinson's disease. *Ther Adv Neurol Disord* 4: 375-383. [Link: http://bit.ly/3qOKiDi](http://bit.ly/3qOKiDi)
2. Bronner G, Royter V (2004) Sexual dysfunction in Parkinson's Disease. *J Sex Marital Ther* 30: 95-105. [Link: http://bit.ly/3liJJFS](http://bit.ly/3liJJFS)
3. Defreitas GA, Lemack GE, Zimmern PE, Dewey RB, Roehrborn CG, et al. (2003) Distinguishing neurogenic from non-neurogenic detrusor overactivity: A urodynamic assessment of lower urinary tract symptoms in patients with and without Parkinson's disease. *Urology* 62: 651-635. [Link: http://bit.ly/30JJvhy](http://bit.ly/30JJvhy)
4. Hely MA, Morris JG, Reid WG, Trafficante R (2005) Sydney multicenter study of Parkinson's disease: Non-L-dopa responsive problems dominate at 15 years. *Mov Disord* 20: 190-199. [Link: http://bit.ly/30KZCuZ](http://bit.ly/30KZCuZ)
5. Feldman HA, Goldstein I, Hatzichristou D (1994) Impotence and its medical and psychosocial correlates: results of the Massachusetts Male Aging Study. *J Urol* 151: 54-61. [Link: http://bit.ly/3cwxuKp](http://bit.ly/3cwxuKp)

6. Aarsland D, Pålhagen S, Ballard CG, Ehrt U, Svenningsson P (2011) Depression in Parkinson's disease—epidemiology, mechanisms, and management. *Nat Rev Neurol* 8: 35-47. [Link: http://bit.ly/3lhHz9f](http://bit.ly/3lhHz9f)
7. Gao X, Chen H, Schwarzschild MA, Glasser DB, Logroscino G, et al. (2007) Erectile function and risk of Parkinson's disease. *Am J Epidemiol* 166: 1446-1450. [Link: http://bit.ly/3tbTUP8](http://bit.ly/3tbTUP8)
8. Jacob EL, Gatto NM, Thompson A, Bordelon Y, Ritz B (2010) Occurrence of depression and anxiety prior to Parkinson's disease. *Parkinsonism Relat Disord* 16: 576–581. [Link: http://bit.ly/2NgScMY](http://bit.ly/2NgScMY)
9. Wei J, Calhoun E, Jacobsen S (2008) Urologic Diseases in America Project: Benign Prostatic Hyperplasia. *J Urol* 179: S75- S80. [Link: http://bit.ly/3lfdMB](http://bit.ly/3lfdMB)
10. Rajfer J, Rocciszewski A, Mehlinger M (1988) Prevalence of corporal venous leaking in impotent men. *J Urol* 140: 66-71. [Link: http://bit.ly/30L0iR3](http://bit.ly/30L0iR3)
11. Bacon C, Mittleman MA, Kawachi I (2003) Sexual function in men older than 50 years of age: results from the Health Professionals Follow-up Study. *Ann Intern Med* 1393: 161-168. [Link: http://bit.ly/2NhtEn4](http://bit.ly/2NhtEn4)
12. Barry MJ, Fowler FJ, O'Leary MP (1992) The American Urological Association Symptom Index for benign prostatic hyperplasia. *J Urol* 148: 1549-1557. [Link: http://bit.ly/3tkSnpS](http://bit.ly/3tkSnpS)
13. Marras C, Beck JC, Bower JH (2018) Prevalence of Parkinson's disease across North America. *Parkinson's Disease* 4: 21. [Link: https://go.nature.com/3bNt0Y8](https://go.nature.com/3bNt0Y8)

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