Parkinson's disease - psychological determinants of quality of life

Dubayova, Tatiana

Chapter 3

The association of type D personality with quality of life in patients with Parkinson's disease

Tatiana Dubayova, Iveta Nagyova, Eva Havlikova,
Jaroslav Rosenberger, Zuzana Gdovinova,
Berrie Middel, Jitse P. van Dijk, and Johan W. Groothoff

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Abstract

Objectives: Personality traits appear as determinants of quality of life (QoL) in most chronic diseases. Type D personality is characterized by ineffective coping strategies that reduce QoL in patients with coronary heart disease. The aim of this study was to evaluate whether Type D personality also predicts QoL in patients with Parkinson's disease (PD). In addition, gender differences in Type D personalities are explored.
Methods: The sample consisted of 153 PD patients (51.4% males; mean age 67.9±9.3 years). DS-14 was used to measure Type D personality, negative affectivity (NA) and social inhibition (SI). The Parkinson's Disease Quality of Life Questionnaire (PDQ-39) was used to assess QoL, and the Unified Parkinson's Disease Rating Scale (UPDRS) was used to assess functional status. The regression model consisted of disease severity, disease duration, age and DS-14 and its two scales (NA and SI).
Results: Type D is negatively associated with overall QoL in PD patients and most subscales of the PDQ-39. Type D explained *emotional well-being* in both genders but was significant in the models for *stigma*, *cognition* and *communication* only in men. NA and SI played a less important role in women in comparison with men.
Conclusion: Type D personality is an important part of the QoL model in PD patients of both genders, especially in the NA scale. The gender differences suggest that male and female PD patients require different coping strategies.

Introduction

Parkinson's disease (PD) obviously has a serious impact on a patient's quality of life (QoL), predominantly in the physical and social domains [1,2]. Symptoms of PD that are likely to affect physical functioning are tremor, rigidity, slowness, gait disorders, freezing, falling, troubles with manual ability, constipation, dysphagia, fatigue, painful spasms and dyskinesias [3]. Problems affecting the mental functioning of PD patients include depression, sleep disorders, cognitive problems and sometimes hallucinations and delirium, which are related to therapy with dopaminergic drugs [4,5]. PD also interferes with social functioning, since PD patients have a higher risk of communication problems, are likely to become unemployed and often avoid social contact, as they may feel embarrassment due to their symptoms becoming manifest [6]. The diversity of symptoms associated with PD and its management leads to worse physical, mental and social well-being in comparison with people of the same age without symptoms of Parkinsonism [7].

With regard to basic sociodemographic and clinical variables, increasing age and longer disease duration were found to be associated with decreased QoL in PD patients [8]. In addition, mildly significant differences in disability and QoL were noted between the genders in general: women reported greater disability and reduction of QoL than did men [9].

Disease severity, especially in the context of motor function impairment of PD patients, significantly reduces QoL and increases difficulties in activities of daily living [10,11]. However, some personality traits were assumed to contribute to the perception of health status and thus led to a worse perception of QoL in people with several chronic diseases as well [12,13]. The psychological variables frequently used in clinical studies are extroversion, neuroticism, anxiety and depression. It has been shown that these variables are assumed to be important contributing factors to QoL and perceived health status in healthy people as well as in people with a disease [14,15]. Differences between genders were also found in these variables, for example, in neuroticism: women consistently scored significantly higher in neuroticism than men [16,17].

The construct of the Type D personality is related to poor cardiac prognosis in patients with coronary heart disease. The interaction between NA (which is closely related to neuroticism) and SI is associated with an increased risk of depressive symptoms, a higher number of reinfarctions and higher mortality rates [18]. About 10-20% of subjects from the normal population can be classified as Type D, and this number increases to 30% in patients with coronary disease and to more than 50% in patients with hypertension [19,20]. Type D has also been characterized by ineffective coping strategies that reduce the QoL of patients with this type of personality [21].

Type D personality may be associated with health-related quality of life not only in cardiovascular diseases, but also in patients with other diseases [19]. The aim of this study was to evaluate whether the Type D personality, after controlling for disease severity, disease duration and age, explains QoL in patients with PD. In addition, gender differences in Type D are explored. The final aim of this study was to evaluate whether there are gender differences in the association of NA and SI personality traits and QoL in patients with PD.

Methods

Subjects and procedure

Data collection took place between February 2004 and February 2006. One hospital in Bratislava and 4 hospitals and 17 outpatient neurologists/clinics in the eastern part of the Slovak Republic gave us access to their

databases of patients with Parkinson's disease. Neurologists from these institutions, using the United Kingdom Parkinson's Disease Society Brain Clinical Criteria [22], had previously diagnosed all patients included in the sample as suffering from Parkinson's Disease.

Questionnaires were sent to these PD patients three weeks before an interview with the researchers. Exclusion criteria were defined as follows: a) patients older than 85 years (prior to sending invitations to patients for a personal examination) because of the high probability of other co-morbidities and movement disabilities of a non-parkinsonian character, and b) patients with an MMSE score below 23 points.

Each patient was interviewed three weeks after receipt of the invitation. After the interview with a psychologist (T.D.), one neurologist from the research team (E.H.) confirmed the initial diagnosis of PD and assessed each patient's disease severity using the Unified Parkinson's Disease Rating Scale (UPDRS Version 3.0) [23]. The patient's cognitive status was assessed using the Mini-Mental State Examination (MMSE) [24]. The structured interview consisted of questions on the patient's medical history and subjective feelings that were not part of the questionnaire. Sociodemographic data were derived from questionnaires filled in by patients themselves and data about antiparkinsonian therapy from medical records.

Participation in the research was voluntary. The study was conducted only after informed consent was obtained from the patients prior to the interview. The local Ethics Committee of the University Hospital in Kosice approved the study in Kosice on 17 December 2002.

Measures

Disease severity

The Unified Parkinson's Disease Rating Scale (UPDRS) is a tool for assessing disease severity in patients with Parkinson's disease and consists of four parts: mentation and mood (Part 1), activities for daily living (Part 2), motor function (Part 3) and complications from dopaminergic therapy (Part 4), including motor fluctuations and dyskinesias. Parts 1, 2, and 4 are interview-based, while Part 3 is based on a clinical examination by a health care professional and represents the patient's condition at the time of examination. A neurologist scores patients on a scale from 0 to 176, where a higher score is indicative of increased disease severity [23].

Type D personality

The DS-14 was used to assess Type D personality and its two constituent subscales, negative affectivity (NA) and social inhibition (SI). NA means

the tendency to experience negative emotions, like anger, dysphoria, irritability, hostile feelings, depressed affect and anxiety. The SI scale covers discomfort in social interactions, reticence and lack of social poise [25]. The construct of Type D personality is stable when compared to the gender effect [20, 25, 26, 27]. Subjects rated these aspects of their personality on a 5-point Likert scale ranging from 0=false, 1=rather false, 2=neutral, 3=rather true to 4=true. The NA and SI scales were then scored as continuous variables (range 0-28). A cutoff of 10 on both scales was used to classify subjects as Type D (NA ≥ 10 and SI ≥ 10) [25]. Cronbach's alpha in the original study was 0.88 for NA and 0.86 for SI. In the current study, DS-14 showed a good internal consistency (with Cronbach's alphas of .77 for NA and .76 for SI).

Quality of life

The Parkinson's Disease Questionnaire-long form (PDQ-39) is a disease-specific instrument developed for measuring health-related quality of life in patients with Parkinson's disease. Its 39 items are divided into 8 scales: *mobility* (10 items), *activities of daily living* (6 items), *emotional well-being* (6 items), *stigma* (4 items), *social support* (3 items), *cognition* (4 items), *communication* (3 items) and *bodily discomfort* (3 items). Respondents selected answers to each question ranging from never (0), occasionally (1), sometimes (2), often (3) and always (4). Each scale and the summary index were then adjusted to have a range from 0 (no problem at all) to 100 (maximum level of problem) [28]. The summary index represents the overall QoL.

Statistical analysis

The Statistical Package for the Social Sciences (SPSS 14.0.1.) was used to analyze the data. Firstly, independent sample t-tests were conducted to assess differences between genders in disease severity, disease duration, age, Type D, NA and SI. In addition, the difference of proportions test (CIA) was used to assess gender differences in partnership and education [29]. Next, multiple linear regression analyses were used to assess the contribution of the independent variables (disease severity (UPDRS), disease duration, age, and the Type D personality trait) on the explained variance of the dependent variables (dimensions of the PDQ-39 and overall QoL). Thirdly, an identical regression analysis was performed for males and females separately. Finally, regression analyses for males and females were performed separately with the NA and SI scales instead of Type D.

Results

Descriptive statistics

Out of 512 patients with Parkinson's disease, 160 agreed to participate and filled in the questionnaires. Non-respondents included 41 patients who refused to participate and 311 who did not respond to the invitation. Seven patients were excluded after the personal interview because of the exclusion criteria. The final sample thus consisted of 153 patients (29.8%). Non-respondents differed significantly from the analyzed group in age (mean difference 1.69 yrs., SE=.87; t=-1.95; 95% CI .010 – -3.39) and there were significantly more women than men among the non-respondents (difference -0.0110; SE=.041; 95% CI -.091 – .069) (Table 3.1).

All patients used antiparkinsonian therapy according international guidelines [30,31]. Twelve percent of patients used only L-dopa, 24% used only dopamine agonists, 25.3% used L-dopa in combination with COMT inhibitors, 20% used L-dopa with dopamine agonists and 16% used a combination of L-dopa, a COMT inhibitor and dopamine agonists.

Both questionnaires, PDQ-39 and DS-14, showed good internal consistency. Cronbach's alphas in the present study for PDQ-39 were as follows: .93 (*mobility*), .91 (*activities of daily living*), .82 (*bodily discomfort*), .86 (*emotional well-being*), .87 (*stigma*), .75 (*social support*), .69 (*cognition*) and .79 (*communication*). Cronbach's alpha for DS-14 in the original study was 0.88 for NA and 0.86 for SI. In the current study, these figures were .77 and .76, respectively.

Model of predictors of QoL

Multiple regression analyses were performed in order to identify how much the variance of the dependent variables (*mobility*, *activities of daily living*, *emotional well-being*, *stigma*, *social support*, *cognition*, *communication*, *bodily discomfort* and the summary score for the PDQ-39) may be explained by Type D and the selected disease and demographic variables.

Type D was strongly associated with all dimensions except *mobility*, *activities of daily living* and *bodily discomfort*, which were explained only by UPDRS. Being Type D was associated with a high score in these dimensions (meaning worse QoL). After UPDRS, Type D also explained most of the variance in the overall model of QoL for PD patients. (Table 3.2)

Table 3.1 Characteristics sample – means and standard deviations (SD) of demographic and study variables.

		Males	Females	Total sample	
Number of subjects (%)		79 (51.6)	74 (48.4)	153 (100)	
Mean age in years (SD)		68.5 (9.2)	67.3 (9.3)	67.9 (9.3)	ns[#]
Mean disease duration (SD)		7.7 (5.7)	7.4 (5.8)	7.5 (5.8)	ns[#]
Disease severity – UPDRS (SD)		38.8 (22.2)	34.9 (18.7)	36.9 (20.6)	ns[#]
Quality of Life – PDQ-39 total (SD)		444.3 (128.9)	475.9 (119.2)	459.5 (124.9)	ns[#]
Married or living with a partner (%)		66 (83.5)	38 (51.4)	104 (68)	95% CI 8.2-46.2
Education	elementary (%)	22 (27.8)	30 (40.5)	52 (34)	ns[α]
	secondary (%)	44 (55.7)	40 (54.1)	84 (55)	ns [α]
	university (%)	13 (16.5)	4 (5.4)	17 (11)	95% CI 1.4-20.7
Type D personality (%)		39 (49.4)	41 (55.4)	80 (52.3)	ns[α]
Negative affectivity (SD)		12.6 (6.1)	13.6 (6.3)	13.1 (6.2)	ns[#]
Social inhibition (SD)		13.0 (5.7)	14.0 (6.5)	16.5 (6.1)	ns[#]

Abbreviations: SD – standard deviation, ns - not significant

[#] t-tests

[α] difference of proportion test

Gender differences in predictors of QoL

UPDRS was an important predictor in the overall model of QoL in both genders and had a relatively high explanatory power particularly in the models of *mobility* and *activities of daily living*. In *cognition* UDPRS was the only important factor, explaining 22% of the model's variance in women. The factors selected for the model were not relevant for explaining the models of *stigma*, *social support* and *bodily discomfort* in either gender, nor the model of *communication* in women.

Type D explained *emotional well-being* in both genders. Among men, Type D was an important factor in the models of *stigmatization by illness*, *cognition* and *communication* but played no role in these models among women. Type D personality did remain an important part of the model in the overall QoL score, however.

In Table 3.3 both scales contributing to Type D are also analyzed separately. NA was found to be significantly associated in both genders with *emotional well-being*. In men it was the only illness-related factor for feeling *stigma*. In women, a higher NA explained the higher dissatisfaction with *social support*. For overall QoL, NA explained 13.2% ($P<0.001$) of the variance in males and 9.3% ($P<0.01$) of the variance in females. SI also explained a maximum of 5.5% ($P<0.05$) of the variance in *communication* in men and 7.3% ($P<0.05$) *stigma* in women.

Table 3.2 Hierarchical multiple regression analysis. Disability (UPDRS), disease duration, age, Type D on PDQ-39 total score and subscales

	mobility		ADL		emotional well-being		stigma		social support		cognition		communication		bodily discomfort		PDQ-39 summary index	
Variables	Δ R2	β	Δ R2	β	Δ R2	β	Δ R2	β	Δ R2	β	Δ R2	β	Δ R2	β	Δ R2	β	Δ R2	β
UPDRS	.47	**.67*** **	.63	**.81*** **	.15	**.27** **	.04	.17	.00	-.03	.15	**.27** **	.16	**.26** **	.07	**.26***	.39	**.54*** **
disease duration	.00	-.02	.00	-.02	.01	.10	.00	.05	.02	.12	.00	.76	.02	**.17***	.00	.02	.01	.09
age	.00	-.01	.01	-.09	.00	-.01	.04	-.16	.03	-.16	.04	**.23** **	.02	**.17***	.01	-.11	.01	-.06
Type D	.01	-.08	.00	-.05	.16	**-.42*** **	.07	**-.26** **	.05	**-.24** **	.04	**-.21***	.07	**-.27*** **	.00	-.07	.08	**-.29*** **
Model	Adj. R2 =.46 F-value=26.7***		Adj. R2 =.63 F-value=52.1***		Adj. R2 =.31 F-value=14.9***		Adj. R2 =.12 F-value=5.0***		Adj. R2 =.08 F-value=3.47**		Adj. R2 =.21 F-value=8.8***		Adj. R2 =.25 F-value=10.9***		Adj. R2 =.05 F-value=2.7*		Adj. R2 =.47 F-value=26.9***	

*p≤.05, ** p≤.01, *** p≤.001

Abbreviations: ADL – activities of daily living, UPDRS – functional status, NA – negative affectivity, SI – social inhibition

Table 3.3 Multiple regression analyses of disability (UPDRS), disease duration, age, Type D, NA and SI on dimensions of PDQ-39 and PDQ-39 summary index in men and women

	mobility		ADL		emotional well-being		stigma		social support		cognition		communication		bodily discomfort		PDQ-39 summary index	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
UPDRS	**.67*** **	**.72*** **	**.85*** **	**.79*** **	.19	.38	.15	**.28***	-.01	.06	.01	**.46*** **	**.37****	.15	.48**	.09	**.54*** **	**.63*** **
disease duration	-.03	-.04	-.07	.01	.11	.11	.00	.09	.11	.13	**.40****	-.14	.15	.14	-.09	.04	.10	.08
age	.00	.04	-.07	-.12	.00	.01	.03	**-.35****	.09	**-.32***	**.34****	.15	**.24***	.15	-.09	.03	.07	-.15
Type D	-.18	.07	-.10	-.01	**-.48*** **	**-.34****	**-.35****	-.22	-.24	-.24	**-.32****	-.05	**-.32****	-.21	-.05	-.03	**-.35*** **	**-.22***
Model	$Adj.R^2_M$=.49		$Adj.R^2_M$=.70		$Adj.R^2_M$=.34		$Adj.R^2_M$=.11		$Adj.R^2_M$=.02		$Adj.R^2_M$=.36		$Adj.R^2_M$=.42		$Adj.R^2_M$=.15		$Adj.R^2_M$=.56	
	$Adj.R^2_F$=.50		$Adj.R^2_F$=.55		$Adj.R^2_F$=.27		$Adj.R^2_F$=.14		$Adj.R^2_F$=.11		$Adj.R^2_F$=.22		$Adj.R^2_F$=.07		$Adj.R^2_F$=.05		$Adj.R^2_F$=.41	
	$F\text{-value}_M$=15.0***		$F\text{-value}_M$=35.6***		$F\text{-value}_M$=8.6***		$F\text{-value}_M$=2.9*		$F\text{-value}_M$=1.3		$F\text{-value}_M$=9.5***		$F\text{-value}_M$=11.6***		$F\text{-value}_M$=3.6*		$F\text{-value}_M$=19.8***	
	$F\text{-value}_F$=15.6***		$F\text{-value}_F$=18.8***		$F\text{-value}_F$=6.5***		$F\text{-value}_F$=3.4*		$F\text{-value}_F$=2.9*		$F\text{-value}_F$=5.2***		$F\text{-value}_F$=2.14		$F\text{-value}_F$=.2		$F\text{-value}_F$=10.9***	

	mobility		ADL		emotional well-being		stigma		social support		cognition		communication		bodily discomfort		PDQ-39 summary index	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
UPDRS	**.68*** **	**.71*** **	**.83*** **	**.79*** **	.16	**.25***	.10	.23	.02	-.02	-.02	**.44*** **	**.37****	.10	**.46****	.05	**.56*** **	**.51*** **
disease duration	-.02	-.05	-.07	-.00	.12	.14	.01	.07	.14	.06	**.40****	-.15	.14	.12	-.09	.07	.09	.10
age	-.01	.05	-.06	-.11	.01	.08	.05	**-.32***	.07	**-.28***	**.35*** **	.16	**.24***	.18	-.08	.05	-.11	.08
NA	.07	-.05	.23	-.05	**.49*** **	**.61*** **	**.46*** **	.06	.12	**.41****	**.31***	.01	.15	.09	.12	.23	**.25***	**.37*** **
SI	.06	.07	-.09	.09	.07	.06	.02	**.30***	-.02	-.02	.11	.13	**.28***	.26	-.04	-.12	.19	.03
Model	$Adj.R^2_M$=.46		$Adj.R^2_M$=.72		$Adj.R^2_M$=.37		$Adj.R^2_M$=.20		$Adj.R^2_M$=.04		$Adj.R^2_M$=.39		$Adj.R^2_M$=.45		$Adj.R^2_M$=.14		$Adj.R^2_M$=.58	
	$Adj.R^2_F$=.49		$Adj.R^2_F$=.55		$Adj.R^2_F$=.54		$Adj.R^2_F$=.18		$Adj.R^2_F$=20		$Adj.R^2_F$=.22		$Adj.R^2_F$=.11		$Adj.R^2_F$=.04		$Adj.R^2_F$=.48	
	$F\text{-value}_M$=10.9***		$F\text{-value}_M$=32.5***		$F\text{-value}_M$=8.0***		$F\text{-value}_M$=4.0**		$F\text{-value}_M$=.50		$F\text{-value}_M$=8.7***		$F\text{-value}_M$=10.6***		$F\text{-value}_M$=3.0*		$F\text{-value}_M$=17.2***	
	$F\text{-value}_F$=12.2***		$F\text{-value}_F$=15.3***		$F\text{-value}_F$=14.5***		$F\text{-value}_F$=3.6**		$F\text{-value}_F$=4.0**		$F\text{-value}_F$=4.4**		$F\text{-value}_F$=2.4*		$F\text{-value}_F$=.67		$F\text{-value}_F$=11.6***	

*p≤.05, ** p≤.01, *** p≤.001

Abbreviations: M – males, F – females, ADL – activities of daily living, NA – negative affectivity, SI – social inhibition; displayed values are Beta's

Discussion

The Type D construct is a relevant factor for assessing quality of life in patients with Parkinson's disease. Having a Type D personality was, after disease severity, the second most important part of the model of overall QoL in PD patients and is related to their worse score in the dimensions of *emotional well-being*, *stigma*, *social support*, *cognition* and *communication*, in particular. With the exception of *cognition,* all other domains associated with Type D are connected with social functioning or social life. Although both Type D scales define negative feelings and attitudes of the individual, which in turn negatively determine social behavior [25], it may be stated that people with a higher score in Type D are generally less satisfied with various aspects of their social life. Type D persons are well aware of their level of emotional distress as indicated by high scores on distress measures. It is possible that distress mediates the influence of Type D personality on QoL. Therefore, repressive coping would also have to predict clinical events beyond the effect of Type D personality [32,33].

Even though the genders did not differ in the distribution of the Type D personality in the analyses, the impact of Type D personality on quality of life is apparent by gender. In the model of overall quality of life, NA appeared to be important for both genders, contrary to SI, which does not play a role in the model. A higher score in NA was associated with a worse score in the dimensions of *stigma* and *cognition* in men, while in women it was associated with a worse score in *social support*. In both genders, NA explained the variance in *emotional well-being*. SI was important in the model of *communication* in men and *stigma* in women. In women, personality traits like NA or SI seemed to play a less important role in comparison with men, in contrast to gender differences in personality traits reported in a study by Martin and Kirkcaldy (1998). In their study, females scored generally higher in neuroticism compared with males [34]. In line with the results of this paper, it can be hypothesized that models of QoL for men and women are composed of different variables.

Only a few studies have investigated gender differences in PD patients. These studies compared both groups mainly with regard to sociodemographic characteristics, socioeconomic status and disease duration [8,35]. In one cross-sectional study of PD patients [36], no differences in PDQ-39 scores between men and women were found, and the authors found that neither age nor gender had a significant impact on quality of life in PD patients studied. On the contrary, being older, being female and belonging to lower socioeconomic groups are associated with poorer quality of life in the general population [36,37].

Our results can be compared with those from a study of older adult couples by Robb et al. (2003), in which n*euroticism* and extroversion

emerged as moderators of the association of stressors and the husband's subjective well-being [38]. The gender aspect of QoL appears to be an important topic for further research, which could go deeper into the psychological differences between men and women.

A limitation of this study was the relatively low response rate, which may have an impact on generalization of the results to the total population of PD patients. Non-respondents were older than respondents, so it may be supposed that they refused to participate in the study because of serious motor complications found in the higher stages of PD and due to the need for help from their social surroundings. Regrettably, we have no information about disease duration and disease severity of non-respondents.

The analysis presented in this paper explains just part of the variance of the QoL of patients with PD. In several models, e.g. *communication*, *bodily discomfort* or *social support*, differences between genders existed in the adjusted explained variance. These differences in the models suggest possible differences in the main variables in both genders, which suggests that the model of QoL is composed of different variables for each gender. Personality traits seem to be one of the possible ways to explain these differences.

More knowledge about the association of negative affectivity, social inhibition and quality of life in PD patients may give us a clearer view of patient complaints in the case of worsening quality of life. It is important in further research to unravel the relationship between Type D, distress and QoL. In addition, the gender aspect of QoL appears to be an important topic, contributing to our knowledge about psychological differences between men and women. Consequently, coping styles and self-management skills in both genders might also differ, as has been shown in several other studies [39,40]. Because of the possible different needs of men and women, psychological intervention programs may need to be different as well.

This study concludes that the Type D personality and its scales of negative affectivity and social inhibition are important factors that may play an important role in assessing quality of life in patients with Parkinson's disease.

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