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Journal of the Neurological Sciences 255 (2007) 77 – 80

Journal of the Neurological Sciences

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Validation of PDQ-8 as an independent instrument in English and Chinese

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Received 20 October 2006; received in revised form 17 January 2007; accepted 23 January 2007

Abstract

Previous validation studies on the PDQ-8, a brief disease-specific quality of life instrument, were performed with the PDQ-8 nested in the original PDQ-39. Such an approach may influence patient responses and the psychometric properties of the PDQ-8. We therefore undertook this study to validate the PDQ-8 when administered independently in English and Chinese and found good item-to-scale correlations (correlation coefficient: 0.44–0.68) and internal consistency (Cronbach's alpha: 0.81, 0.87). Factor analyses yielded a component on which all 8 questions were substantially loaded (loading range: 0.55–0.77). Scree plots also showed the one-factor solution thereby validating the PDQ-8 summary index. Construct validation against the Hoehn and Yahr stage and UPDRS motor scores showed significant correlations between higher PDQ-8 summary index and increased disease severity in both English and Chinese versions. Our results show the PDQ-8 to be a valid and reliable disease-specific HRQoL instrument for PD when used independently of the PDQ-39.

Keywords: PDQ-39; PDQ-8; Parkinson's disease; Quality of life; Singapore

1. Introduction

Parkinson's disease (PD) is a chronic debilitating disease that affects not only the motor function of an individual but also cognitive, emotional, sensorial, and autonomic aspects. The impact of these factors on a patient's life may be better assessed by self-reported health related quality of life (HRQoL) instruments than by standard clinician completed rating scales. The HRQoL instrument which has been most widely validated and used in PD has been the PDQ-39 [1]. The PDQ-39 has also been validated both in English and Chinese in Singapore [2,3].

As the PDQ-39 takes some time to complete, its use has been restricted primarily to research settings. It has been suggested that the briefer instrument — PDQ-8, will place less burden upon respondents and enable a wider usage of the instrument in busy clinics [2,4]. The PDQ-8 is also increasingly being used in clinical trials [5] and research [6–8]. Validation studies for the PDQ-8 have found this instrument to be representative of the parent PDQ-39 [2–4,9,10]. However, all these studies have been performed with the inclusion of the PDQ-8 as part of the PDQ-39, raising concern that such an approach may influence patient responses and the psychometric properties of the PDQ-8 [10]. To understand the extend of this problem and determine the validity of the PDQ-8 when used independently, we undertook this study to further validate the PDQ-8, when administered apart from the PDQ-39, in English and Chinese in Singapore.

2. Methods

2.1. Study design

Consecutive patients with Parkinson's disease (PD) who could read local English or Chinese newspaper seen at the Parkinson's Disease and Movement Disorders Centre of the

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doi:10.1016/j.jns.2007.01.072

Table 1
Patients' characteristics

	Mean (standard deviation)			p-value*
	Total	English ($n=104$)	Chinese ($n=79$)	
Male	126 (68.9)	76 (73.1)	50 (63.3)	0.157
Age, year	61.0 (9.8)	59.9 (9.8)	62.5 (9.7)	0.080
Ethnicity, *N* (%)				
Chinese	158 (86.3)	79 (76.0)	79 (100)	–
Malay	10 (5.5)	10 (9.6)	0 (0)	
Indian	13 (7.1)	13 (12.5)	0 (0)	
Other	2 (1.1)	2 (1.9)	0 (0)	
Education, *N* (%)				
≤6 years	63 (34.4)	21 (20.2)	42 (53.2)	<0.001
7–12 years	77 (42.1)	51 (49.0)	26 (32.9)	
>12 years	43 (23.5)	32 (30.8)	11 (13.9)	
Duration of PD, year	4.6 (3.8)	4.6 (3.9)	4.7 (3.7)	0.848
H&Y score	2.3 (0.7)	2.3 (0.7)	2.3 (0.7)	0.640
Motor score	21.9 (11.0)	20.4 (11.1)	24.0 (10.5)	0.028
PDQ-8SI	27.5 (19.9)	23.4 (17.2)	32.8 (21.9)	0.002

* Two-sample *t*-tests or Chi-square tests.

National Neuroscience Institute between November 2004 to September 2005 were recruited for the study. All participants met the NINDS criteria for the diagnosis of Parkinson's disease [11]. PD patients were asked to self-administer the 8-item Parkinson's disease questionnaire in English or Chinese independently during the clinic visit. To minimize missing data, a research nurse checked for completeness when each patient returned his or her completed questionnaire. Basic demographic information together with measures of disease severity such as duration of PD, Hoehn and Yahr (H&Y) stage, and UPDRS motor score were obtained on the day of the interview. Patients with concurrent dementia with Chinese mini mental state examination of equal or less than 20 were excluded. The Institutional Review Board approved the protocol and all participants gave informed consent.

2.2. Instrument

The 8-item Parkinson's disease questionnaire (PDQ-8) is a briefer version of the 39-item Parkinson's disease questionnaire (PDQ-39) which measures the HRQoL of PD patients over the past month [9]. It has 8 specific PDQ-39 items, with each item representing one PDQ-39 dimension, i.e. mobility, activities of daily living, emotional well-being, social support, cognition, communications, bodily discomfort, and stigma. A summary index (PDQ-8SI) can be calculated from score of the 8 PDQ-8 questions and standardized on a scale from 0–100, with lower scores indicating better HRQoL [9]. Higher PDQ-8SI scores indicate worse quality of life.

2.3. Statistical analysis

The scoring assumption of the PDQ-8 was assessed using item-to-scale correlation, principal component factor analysis, and according to internal consistency reliability.

In factor analysis, we used eigenvalue and Scree plot to determine the dimensionality of the PDQ-8. Uni-dimensionality would be confirmed if only one component has an eigenvalue of >1.0 and all other components are on the base of the Scree plot. Item-to-scale correlation was calculated for each item by removing the contribution of the item to the scale score. A correlation of >0.4 was considered as acceptable. The internal consistency of the PDQ-8SI was assessed using Cronbach's alpha. An alpha value of ≥0.7 was considered satisfactory.

Correlations between the PDQ-8SI and clinical variables were examined to assess construct validity. We hypothesized that the PDQ-8SI score would increase with longer duration of PD, higher H&Y stage score, and higher motor score. A correlation coefficient of <0.35, 0.35 to 0.50, and >0.5 was considered weak, moderate, and strong respectively [12].

Separate analysis was conducted for English and Chinese versions of the PDQ-8 using SPSS for Windows (version 14). All correlations were assessed using Spearman's rank correlation coefficients. All statistical tests were 2-tailed with a significance level of 0.05.

3. Results

One hundred and four PD patients who completed the English PDQ-8 and 79 patients who completed Chinese version were included in data analyses. There were no missing data. Table 1 summarizes the basic demographic information, measures of disease severity and PDQ-8 SI of participants of the study. English-speaking and Chinese-speaking patients were similar in socio-demographic characteristics except that more English-speaking patients had completed 7 or more years of education (79.8% versus 46.8%, $p<0.001$, Chi-square test) and that all Chinese-speaking patients were ethnic Chinese (Table 1). In addition, compared with English-speaking patients, Chinese-speaking patients had a higher mean motor score (24.0 versus 20.4, $p=0.028$, two-sample *t*-test) and a higher mean PDQ-8SI score (32.8 versus 23.4, $p=0.002$, two-sample *t*-test).

No ceiling or floor effects were observed for English and Chinese PDQ-8SI. For both versions, no patients were

Table 2
Item-to-scale correlations and item loadings in principal component factor analysis

	Correlation coefficient		Item loading in factor analysis	
	English	Chinese	English	Chinese
Mobility	0.55	0.65	0.68	0.73
Activities of daily living	0.56	0.57	0.70	0.69
Emotional well-being	0.56	0.61	0.69	0.70
Social support	0.46	0.62	0.60	0.70
Cognitions	0.52	0.61	0.65	0.73
Communication	0.67	0.68	0.75	0.77
Bodily discomfort	0.44	0.60	0.55	0.70
Stigma	0.50	0.65	0.62	0.76