

Validity and Reliability of the Turkish Version of the 8-Item Parkinson's Disease Questionnaire

Sekiz Maddeli Parkinson Hastalığı Anketi'nin Türkçe Sürümünün Geçerliliği ve Güvenilirliği

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ABSTRACT

Introduction: Symptomatic control and improvement of health-related quality of life (HRQoL) is a key feature of the management of patients with Parkinson's disease (PD). The 39-item Parkinson's Disease Questionnaire (PDQ) and its short version, PDQ-8, validated disease-specific patient-reported instruments, have been highly recommended to use for assessing HRQoL in patients with PD. The aim of this study was to assess the reliability and validity of the Turkish version of the PDQ-8.

Methods: Eighty-three patients with PD were recruited for this methodological and cross-sectional study. The PDQ-8 was repeated to assess the test-retest reliability after one-week interval. The participants completed the 36-Item Short Form Health Survey (SF-36) as a generic HRQoL previously validated in Turkey. The Hoehn & Yahr stages of the patients were also determined. The SF-36 and Hoehn & Yahr stages were used to assess the convergent validity of the PDQ-8.

Results: The Cronbach's alpha coefficient was 0.78 (95% CI: 0.70-0.84, $p < 0.001$) for PDQ-8. The test-retest reliability was very high as the intra-class correlation coefficient was 0.97 (95% CI: 0.93-0.99, $p < 0.001$). The PDQ-8 had significant correlations with the physical and mental component scores of SF-36 ($\rho = -0.52$, $p < 0.001$ and $\rho = -0.64$, $p < 0.001$, respectively) and Hoehn & Yahr stages ($\rho = 0.56$, $p < 0.001$). There was no evidence of floor or ceiling effects.

Conclusion: The results of this study suggest that the Turkish version of the PDQ-8 is a reliable, valid, less time-consuming, and brief disease-specific instrument to assess HRQoL in patients with Parkinson's disease.

Keywords: Validity, reliability, Parkinson's disease, PDQ-8, quality of life, Turkey

ÖZ

Amaç: Parkinson hastalığı (PH) olan hastaların belirtilerinin denetim altına alınması ve sağlıkla ilişkili yaşam kalitelerinin artırılması hastalığın yönetiminde öncelikli konulardan biridir. Geçerliliği gösterilmiş, hastalığa özgü ve hastanın kendi kendine doldurduğu 39 maddeli Parkinson Hastalığı Anketi (PHA) ve onun kısa sürümü olan PHA-8'in PH hastalarında sağlıkla ilişkili yaşam kalitesinin değerlendirilmesinde kullanılması gerektiği şiddetle önerilmektedir. Bu çalışmanın amacı PHA-8'in Türkçe sürümünün geçerlilik ve güvenilirliğini incelemektir.

Yöntem: PH olan 83 hasta metodolojik ve kesitsel türde olan bu çalışmaya dahil edildi. Test-tekrar test güvenilirliğinin belirlenmesi için PHA-8'in bir hafta arayla iki kez dolduruldu. Daha önce Türkçe geçerliliği gösterilmiş olan Kısa Form-36 (KF-36) genel yaşam kalitesi ölçeği olarak kullanıldı. Ayrıca hastaların Hoehn & Yahr evreleri belirlendi. KF-36 ve Hoehn & Yahr evreleri PHA-8'in yakınsak geçerliliğinin belirlenmesi için kullanıldı.

Bulgular: PHA-8'in Cronbach alfa katsayısı 0,78 (%95 GA: 0,70-0,84, $p < 0,001$) olarak hesaplandı. Test-tekrar test güvenilirliği çok yüksek olarak bulundu (sınıf içi korelasyon katsayısı=0,97, (%95 GA: 0,93-0,99, $p < 0,001$). PHA-8 ile KF-36'nın fiziksel ve mental bileşenleri ve Hoehn & Yahr evreleri arasında anlamlı korelasyon vardı (sırasıyla $\rho = -0,52$, $\rho = -0,64$, $\rho = 0,56$, $p < 0,001$). Tavan ve taban etkisiyle ilgili herhangi bir kanıt bulunmadı.

Sonuç: Bu çalışmanın sonuçları, PH olan hastaların sağlıkla ilişkili yaşam kalitelerini değerlendirebilmek için PHA-8'in Türkçe sürümünün güvenilir, geçerli, az zaman tüketen, kısa ve hastalığa özgü bir ölçüm yöntemi olduğunu düşündürmektedir.

Anahtar Kelimeler: Geçerlilik, güvenilirlik, Parkinson hastalığı, PHA-8, yaşam kalitesi, Türkiye

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INTRODUCTION

Parkinson's disease (PD) is a progressive neurodegenerative disease having both motor and non-motor features (1). Currently, symptomatic control and improvement of health-related quality of life (HRQoL) is a key feature of the management of patients with PD (1). Therefore, there is a need of an instrument having good psychometric properties to assess HRQoL as an important clinical outcome.

A number of disease-specific patient reported outcome measures such as the Parkinson's Disease Quality of Life Questionnaire, Parkinson's Impact Scale, Parkinson's Disease Quality of Life Scale have been developed to capture the overall impact of PD on HRQoL (2–4). The 39-item Parkinson's Disease Questionnaire (PDQ-39), validated disease-specific patient reported instrument, has been highly recommended to use for assessing HRQoL in patients with PD (5, 6). A brief version of the PDQ-39 called as the 8-item Parkinson's Disease Questionnaire (PDQ-8) has been developed. The PDQ-8 consists eight items which of them belongs to each of the eight dimensions in the original PDQ-39 (7, 8). The PDQ-8 has some advantages compared to the PDQ-39 such as being easy to use, more practicable, and less time-consuming (9). The PDQ-8 is an instrument with good psychometric properties to assess the HRQoL in patients with PD, and more suitable for large-scale studies in which a brief patient reported instrument is preferred (7). Additionally, the PDQ-8 places less burden upon respondents, and is more suitable in busy clinics (10).

There is a lack of valid and reliable PD specific patient reported outcome measures for assessing HRQoL in Turkey (1). To the best of our knowledge, there is only one valid and reliable Turkish questionnaire named Parkinson's Disease Quality of Life Questionnaire which was originally developed by de Boer et al. (2, 11). However, this questionnaire is quite lengthy, and may not be suitable for everyday clinical use. Additionally, it is not commonly used as much as the PDQ-8 which is available in over 80 language versions (7). Although the PDQ-8 was translated into Turkish by the developers using established double back translation methods (7), the reliability and validity of the PDQ-8 has not been evaluated. Therefore, the aim of this study was to assess the convenience of the Turkish version of the PDQ-8.

METHODS

Study Design and Participants

The participants in this methodological and cross-sectional study were recruited from the outpatient clinic for movement disorders of "Dokuz Eylül University". In total, 83 patients with PD satisfying the UK Parkinson's Disease Society Brain Bank clinical diagnostic criteria were included in the study (12). Other including criteria were having age ≥ 40 years, the mini mental state examination score >22 in educated participants and >18 in uneducated participants (13) and without the signs of atypical parkinsonism. The study protocol was approved by Ethics Committee of "Dokuz Eylül University" (registration number: 1959-GOA), and all participants provided informed consent before participating in the study.

Data collection was performed in the routine outpatient clinic visits of the participants. Demographic and clinical characteristics such as age, gender, level of education, marital status, co-morbidities, duration of disease, and history of levodopa administration were recorded.

Outcome Measurements

The PDQ-8 is a brief form of the PDQ-39 (8). One question from each of the eight domains on the PDQ-39 which are activities of daily living, bodily discomfort, cognition, communication, emotional well-being, mobility, social support, and stigma was chosen based on the strength

of its correlation with the total domain score. Each question was scored from 0–4 points, and the scores were summed. The summed score was then divided by total possible score, and given as a percentage score out of 100. The PDQ-8 was translated into Turkish by the developers using established double back translation methods, and the permission for the psychometric study of this Turkish form of the PDQ-8 was obtained from the developer company (Isis Innovation Ltd, Oxford, UK). To assess the test-retest reliability of the PDQ-8, it was filled out two times with one-week interval by randomly selected 24 participants from the same study sample.

The disease severity was assessed using the Hoehn & Yahr scale during "on" status by the same neurologist who is specialized in movement disorders. The Hoehn & Yahr scale is widely used clinical rating scale for patients with PD, and evaluates the disease severity based on functional disability and clinical findings (14). There are five stages in the Hoehn & Yahr scale, and a higher stage presents more severe functional disability. The stage 0 indicates no visible symptoms of PD, and the stage 5 indicates a patient who is not able to walk and has symptoms on both body (14).

Generic HRQoL was assessed by using the Turkish form of the Short Form (SF)-36 questionnaire which is divided in eight scales as bodily pain, general health, mental health, physical functioning, role emotional, role physical, social functioning, and vitality (15). Scores for the physical and mental composite were calculated based on these eight domains. The physical composite score comprises bodily pain, general health, physical functioning, and role physical, and the remaining domains are used to calculate the mental composite score. The SF-36 Health Survey Scoring Demonstration website was used calculation of the physical and mental composite scores (16). The scores ranged from 0 to 100 as higher values indicate better HRQoL.

Statistical Analysis

Descriptive statistics were used to evaluate the demographic and clinical characteristics of the participants. The internal consistency was assessed by calculating Cronbach's alpha coefficients categorized as follows: excellent, >0.80 ; adequate, 0.70 – 0.79 ; and inadequate, <0.70 (17). The test-retest reliability was assessed by calculating intra-class correlation coefficient (ICC) which were interpreted as very low for $ICC \leq 0.25$, low for $ICC = 0.26$ – 0.49 , moderate for $ICC = 0.50$ – 0.69 , high for $ICC = 0.70$ – 0.89 , and very high for $ICC \geq 0.90$ (18). The 95% confidence intervals (CI) were also calculated. To assess convergent validity of the Turkish version of the PDQ-8, we hypothesized that the higher PDQ-8 scores should be correlated with lower SF-36 scores and higher Hoehn & Yahr stage. Because the data was not distributed normally, checked with Kolmogorov-Smirnov test and histograms, this hypothesis was tested with the Spearman's rank correlation coefficient. The floor and ceiling effects on the Turkish version of the PDQ-8 were calculated the percentage of respondents with scores at the ceiling (score of >95) and floor (score of <5). The level of significance was determined at $p < 0.05$. All data were analysed using the IBM® SPSS® for Windows software (Version 20.0. Armonk, NY: IBM Corp.).

RESULTS

The mean age of the participants was 68.3 SD 9.3 years, and the median disease duration was 6.5 (min-max=1–29) years. Nearly half (49.4%) of the participants were female. Most of the participants (82.0%) were in the Stage 3, or less in the Hoehn & Yahr scale. Detailed demographic and clinical characteristics were presented in Table 1.

The Cronbach's alpha coefficient was 0.78 (95% CI: 0.70 – 0.84 , $p < 0.001$) which was interpreted as the Turkish version of the PDQ-8 had an adequate internal consistency. The test-retest reliability was very high as the ICC was 0.97 (95% CI: 0.93 – 0.99 , $p < 0.001$) (Table 2).

Table 1. Demographic and clinical characteristics of the participants (n=83)

Variables	Median (min-max) or No. (%)
Age, years	68.3 (9.3)*
Gender	
Female	41 (49.4%)
Male	42 (50.6%)
Body mass index, kg/m ²	27.65 (3.92)*
Level of education	
Primary school	42 (50.6%)
Secondary school	10 (12.0%)
High school	15 (18.1%)
University	16 (19.3%)
Marital status	
Married	69 (83.2%)
Single	14 (16.8%)
Disease duration, years	6.5 (1-29)
Hoehn & Yahr Stage	2.5 (1-4)
PDQ-8	25.0 (0-75)
Sf-36 (physical component)	44.7 (20.0-64.0)
Sf-36 (mental component)	49.6 (16.2-65.2)

SD, standard deviation; PDQ-8, 8-item Parkinson's Disease Questionnaire; SF-36, the 36-item Short Form.

*Variable is presented as mean (SD) because of its normal distribution.

Table 2. Results for reliability analysis

PDQ-8	Corrected item-total correlation	Cronbach's alpha if item deleted
Item 1	0.50	0.75
Item 2	0.52	0.75
Item 3	0.51	0.75
Item 4	0.50	0.75
Item 5	0.50	0.75
Item 6	0.54	0.75
Item 7	0.34	0.78
Item 8	0.48	0.75
Total	-	0.78

All internal consistency correlations are statistically significant with $p < 0.001$.

Table 3. Correlations between PDQ-8, SF-36 components, and Hoehn & Yahr Stage

	PDQ-8
SF-36 (physical component)	-0.52
SF-36 (mental component)	-0.64
Hoehn & Yahr Stage	0.56

PDQ-8, 8-item Parkinson's Disease Questionnaire; SF-36, the 36-item Short Form. All correlations are statistically significant with $p < 0.001$.

The PDQ-8 scores were significantly correlated with mental and physical components of SF-36 and Hoehn & Yahr stage ($p < 0.001$) (Table 3). Additionally, there was no evidence of floor or ceiling effects on the Turkish version of the PDQ-8, determined with 6 participants (7.2%) having ≤ 5 and no participants having ≥ 95 score on the PDQ-8.

DISCUSSION

The use of cross-culturally adapted self-reported outcomes in different languages facilitates the collection of reliable data in studies that are conducted in different countries. It also allows for comparison of the results. The current study has indicated that the Turkish version of the PDQ-8 has high test-retest reliability, and adequate internal consistency and convergent validity.

To assess the internal consistency of the Turkish version of the PDQ-8, the item-total correlations were checked and the item 7 had the smallest correlation (0.34). However, the internal consistency does not change when this item is deleted. Considered the PDQ-8 included small number of items and the item 7 evaluates an important domain (bodily discomfort), the item 7 was kept in the Turkish version of the PDQ-8. Additionally, there was no evidence of floor or ceiling effects on the Turkish version of the PDQ-8.

There are several studies to assess validity and reliability of the PDQ-8 in different languages and cultures. The Cronbach's alpha coefficient for the internal consistency was estimated to be between 0.72 and 0.88 in previous studies (9, 10, 19-24). The Cronbach's alpha coefficient reported in this study (0.78) is similar to the Greek (0.72), Italian (0.72), Japanese (0.73), Persian (0.74), and English version in Canadian (0.72) and Singaporean (0.75), and Spanish (0.79) populations (9, 19-23). On the other hand, some studies reported higher Cronbach's alpha coefficients for some countries such as Taiwan (0.81), Canada (0.83), Italy (0.87), Singapore (0.81, 0.87), and United States of America (0.88) (10, 23, 24). Cronbach's alpha coefficient is generally regarded as good when it is more than 0.7 (23). Therefore, the Turkish version of the PDQ-8 has good internal consistency as much as other language versions of the PDQ-8.

A questionnaire should not only have a good validity but also a good reliability. Therefore, the test-retest reliability of the Turkish version of the PDQ-8 was investigated, and found as very high (ICC=0.97). While the test-retest reliability of the Persian version (0.98) was similar to the Turkish version, the Greek version had less ICC (0.72) (9, 20).

The predefined hypothesis to test convergent validity regarding the correlations between the PDQ-8 and SF-36 scores, and Hoehn & Yahr stage was confirmed. The higher PDQ-8 scores were significantly correlated with lower mental and physical component of the SF-36 scores, and higher Hoehn & Yahr stage. Several studies have also investigated the correlation between the PDQ-8 and Hoehn & Yahr stage, and reported similar findings like the current study (9, 10, 19, 22-24). These findings have indicated that PDQ-8 as a disease-specific HRQoL questionnaire is correlated with a generic HRQoL questionnaire. Additionally, the greater levels of functional disability were associated with poorer HRQoL in patients with PD.

There are some potential limitations in this study. Firstly, because the participants were recruited from an outpatient clinic, the study sample did not include any patient with PD in severe stage of the disease. Additionally, the participants were selected from the same clinic. Therefore, the generalizability of the findings of the study might be restricted. The second limitation was the cross-sectional design of the study. It would be important to determine the responsiveness of the Turkish version of the

PDQ-8 to changes in disease severity by the longitudinal studies. Lastly, the operational qualities such as the percentage of participants who completed autonomously, and the time taken to do the PDQ-8 were not evaluated.

CONCLUSIONS

This study has suggested that the Turkish version of the PDQ-8 has very high test-retest reliability, adequate internal consistency, and convergent validity. It is the only one available instrument in Turkey to assess disease-specific HRQoL in patients with PD. The Turkish version of the PDQ-8 having good psychometric properties is a practical and informative instrument to easily use in clinics, especially in busy ones, and large-scale studies in which a brief instrument is preferred.

Ethics Committee Approval: The study protocol was approved by Ethics Committee of Dokuz Eylül University (registration number: 1959-GOA)

Informed Consent: Written consents were obtained from the participants.

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