Validity and Reliability Assessment of a Japanese Version of the Snaith-Hamilton Pleasure Scale

Hiroshi Nagayama¹, Shin-ichiro Kubo², Taku Hatano³, Shinsuke Hamada³, Tetsuya Maeda⁴, Takafuli Hasegawa⁵, Taro Kadowaki⁶, Hiroo Terashi⁷, Masayuki Yoshioka⁸, Nobuatsu Nomoto⁹, Osamu Kano¹⁰, Manabu Inoue¹¹, Hideki Shimura¹², Tatsuya Takahashi¹³, Tsuyoshi Uchiyama¹⁴, Hirohsia Watanabe¹⁵, Satoshi Kaneko¹⁶, Tetsuya Takahashi¹⁷, Yasuhiko Baba¹⁸ and
(Young Japanese Expert Group for Parkinson’s Disease and Movement Disorders: YJ-EXPANDS)

Abstract

Objective Anhedonia is one of the main non-motor symptoms in Parkinson’s disease (PD); it is assessed using the Snaith-Hamilton pleasure scale (SHAPS). To assess anhedonia in the Japanese population, we prepared a Japanese language version of SHAPS (SHAPS-J), and evaluated its validity and reliability in 8 neurological centers. Seventy subjects (48 patients with PD and 22 healthy subjects) were enrolled in this study.

Methods The validity of the test was assessed by the correlation between SHAPS-J and the apathy scale, based on the fact that anhedonia is considered a symptom of apathy syndrome. Test-retest reliability and internal consistency were assessed by Cohen’s kappa and Cronbach’s alpha coefficients, respectively.

Results In the evaluation of validity, the total scores obtained on SHAPS-J during the test and retest significantly correlated with scores on Item 4 in Part 1 of the unified Parkinson’s disease rating scale (p<0.0008 and p<0.0036, respectively). Cohen’s kappa coefficient was >0.3 on all items (p<0.0005 on all items). Cronbach’s alpha coefficient was 0.90 at the baseline and 0.88 at the retest.

Conclusion These results indicate that SHAPS-J has good validity, test-retest reliability, and internal consistency, thus establishing an available measure of anhedonia in Japanese.

Key words: Parkinson’s disease, anhedonia, Snaith-Hamilton pleasure scale, validity, reliability

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¹Department of Internal Medicine, Division of Neurology, Nephrology and Rheumatology, Nippon Medical School, Japan, ²Department of Neurology, Juntendo University School of Medicine, Japan, ³Department of Neurology, Hokuyakai Neurological Hospital, Japan, ⁴Department of Neurology, Research Institute for Brain and Blood Vessels, Japan, ⁵Division of Neurology, Department of Neuroscience & Sensory Organs, Tohoku University Graduate School of Medicine, Japan, ⁶Department of Neurology, Ashikaga Red Cross Hospital, Japan, ⁷The Third Department of Internal Medicine, Tokyo Medical University, Japan, ⁸Department of Neurology, Aoto Hospital, The Jikei University School of Medicine, Japan, ⁹Department of Internal Medicine, Division of Neurology, Toho University Ohashi Medical Center, Japan, ¹⁰Department of Neurology, Toho University Omori Medical Center, Japan, ¹¹Department of Internal Medicine, Division of Neurology, Showa University Northern Yokohama Hospital, Japan, ¹²Department of Neurology, Juntendo University Urayasu Hospital, Japan, ¹³Department of Neurology, National Hospital Organization Yokohama Medical Center, Japan, ¹⁴Department of Neurology, Seirei Hamamatsu General Hospital, Japan, ¹⁵Department of Neurology, Nagoya Graduate School of Medicine, Japan, ¹⁶Department of Neurology, Kansei Medical University, Japan, ¹⁷Department of Clinical Neuroscience and Therapeutics, Hiroshima University Hospital, Japan and ¹⁸Department of Neurology, Fukuoka University Faculty of Medicine, Japan

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Correspondence to Dr. Hiroshi Nagayama, nagayama@nms.ac.jp
Introduction

Parkinson’s disease (PD) has recently been considered a disorder characterized not only by motor symptoms, but also by many non-motor symptoms such as psychosis, apathy, anxiety, and depression (1). The manifestation of some non-motor symptoms is thought to be linked to the pathophysiology of PD itself (2). Depression is the most common psychiatric complication of PD, and anhedonia is reported to be one of the main symptoms of depression in PD (3). Anhedonia occurs in up to 40% of PD patients (4).

Anhedonia is considered not a syndrome, but a symptom. It has been identified as a symptom of apathy syndrome (5), one of the core features of major depression, and one of the negative symptoms of schizophrenia (6). Anhedonia is generally explained as an “inability to experience pleasure” (7); however, this condition does not have an obvious definition.

A few scales are available for the evaluation of anhedonia; the Snaith-Hamilton pleasure scale (SHAPS) (7) and the Chapman scales for physical and social anhedonia (8) have been employed in some studies. The Chapman scales can separately assess physical and social anhedonia, and are widely used for assessing psychiatric disorders such as depression and schizophrenia. The original scale comprises 88 true/false questions (physical and social anhedonia categories comprising 40 and 48 items, respectively). Moreover, this scale includes different aspects for assessment of apathy without anhedonia. In use for non-PD cases, it has also been indicated that many items are sensitive to personal opinions, preferences, and habits (9). One study employed Chapman scales for assessing anhedonia in PD; however, the author highlighted the faults and impracticability of using this scale (10).

SHAPS was originally developed for the assessment of anhedonia to evaluate the presence of anhedonia and the levels of hedonic tone. This scale is a self-rated questionnaire that comprises 14 items, and is concise and simple to complete on a clinical basis. Although it lacks validation in PD patients, this scale has a good face validity, internal consistency, item-total correlation, and test-retest correlation in non-PD subjects (7). SHAPS has recently been widely used for assessing anhedonia in PD patients (11, 12); however, it includes some inappropriate items related to symptoms generally found in PD, such as hyposmia and difficulty of movement.

According to a report by Leentjens et al, (9) SHAPS is classified at a higher recommendation level than the Chapman scales to assess anhedonia in PD. SHAPS has been translated into a few languages, for which the validity and reliability have been established (11, 12). However, there are no reports of a Japanese language version of SHAPS. In this study, we prepared a Japanese language version of SHAPS (SHAPS-J), and evaluated its validity and reliability.

Materials and Methods

These studies were conducted in the Young Japanese Expert Group for Parkinson’s Disease and Movement Disorders (YJ-EXPANDS). This study was performed in 8 neurological centers (Aoto Hospital of The Jikei University School of Medicine, Ashikaga Red Cross Hospital, Fukuoka University Hospital, Juntendo University Hospital, Nippon Medical School Main Hospital, Research Institute for Brain and Blood Vessels, Toho University Ohashi Medical Center and Seirei Hamamatsu General Hospital), and was approved by the Ethics Committees of all the participating institutes. Written, informed consent was obtained from all the patients and subjects.

Translation process

In this process, 2 independent bilingual professional translators participated in the translation. After the authors (HN, SK, and TH) translated SHAPS into Japanese, translator A- whose native language is English-retranslated it back into English. Next, translator B- whose native language is Japanese-checked the differences between the original and back-translated versions. The translation and retranslation process was continued until the meaning of the back-translated version was the same as the original. The last Japanese version was approved as SHAPS-J.

Validity and reliability study: Subjects and design

To evaluate the reliability and validity of SHAPS-J, we administered the questionnaire to 2 groups of subjects: the first group comprised 48 patients (22 men and 26 women) with PD; the second group comprised 22 subjects (10 men and 12 women) without PD as the normal controls. All patients and controls were 20 years of age or older. All PD cases fulfilled the criteria of the British Brain Bank for the clinical diagnosis of PD (13). Patients with PD whose score on the mini-mental state examination (MMSE) (14) was 22 or less were excluded because of concerns about comprehension of the questionnaire. None of the normal controls had a history of neurological or psychiatric disease, and had no cognitive impairment (MMSE score; ≥ 28). In this study, to assess whether subjects understood the meaning of the questionnaire, they answered the questions with an examiner. In the PD group, the mean age (± 1 standard deviation) was 67.7±9.0 years, the mean disease duration was 74.1±46.6 months, and the mean modified Hoehn-Yahr stage was 2.1±0.8 at the time of examination. In the control group, the mean age was 62.9±17.3 years.

The validity of this scale was evaluated by comparing the total score obtained using SHAPS-J with that obtained using the other scales. To our knowledge, there is no other validated anhedonia scale in the Japanese language. It is suggested that the symptoms of apathy, anhedonia, and depression are closely related in PD, (9) and that anhedonia may be a part of the syndrome of apathy, as described...
supported by Excel, the original formulas were entered in Excel for the analysis. Because the calculations of Cronbach’s alpha coefficient was measured. The response to each item of the SHAPS-J questionnaire was converted to a 4-degree ordinal scale, as described above, and these were used for calculating Cronbach’s alpha coefficient. The results of Cronbach’s alpha coefficient at the baseline and retest is shown in Table 1; significant correlation was thus found.

The reliability study was performed on all subjects. In the assessment of test-retest reliability, Cohen’s kappa coefficient and its 95% confidence interval were measured. These values for each item are shown in Table 2. Kappa coefficient was >0.3 in all items (p<0.0005 in all 14 items). The lower limit of the 95% confidence interval was also >0 for all items. In the assessment of internal consistency, Cronbach’s alpha coefficient was measured. The results of Cronbach’s alpha coefficient at the baseline and retest is shown in Table 1.

### Statistical analyses

Spearman’s rank correlation was used in the assessment of validity. For evaluating reliability, Cohen’s kappa coefficient was used for analysis of test-retest reliability, and internal consistency was measured by Cronbach’s alpha coefficient. Statistical significance was assessed for p<0.05. The interpretation of Cohen’s kappa and Cronbach’s alpha coefficients was followed in the previous explanation.

Statistical analysis was performed using Microsoft Excel for Mac 2004, version 11.6.4. Because the calculations of Cohen’s kappa and Cronbach’s alpha coefficients were not supported by Excel, the original formulas were entered in Excel for the analysis.

### Results

SHAPS-J was assessed in 70 subjects. The mean number of days between test and retest was 39.8±20.5. No problems occurred in the understanding or execution of the SHAPS-J questionnaire for all subjects. According to the original scale, when any of the “Disagree” responses scored 1 point and any of the “Agree” responses scored 0 points, the mean score of SHAPS-J was shown in Table 1.

The validation study was carried out only in the PD group. In the evaluation, points given for responses on the SHAPS-J were redefined as follows, because results were expressed on an ordinal scale: a response of “Strongly disagree” in the original version was given 4 points, “Disagree” was given 3, “Agree” was given 2, and “Strongly/Definitely agree” was given 1. In the analysis of the correlation between total score obtained using SHAPS-J and the score obtained using Item 4 of the UPDRS, the rho value of Spearman’s rank correlation test at the baseline and re-test was shown in Table 1; significant correlation was thus found.

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### Discussion

In the present study, we show that SHAPS-J has good validity, test-retest reliability, and internal consistency. There was no problem in comprehension of SHAPS-J, and all subjects were able to take the questionnaire easily. We thus believe that these results may allow the use of SHAPS-J in routine clinical practice and research.

To evaluate validity, the score obtained using UPDRS Part 1, Item 4 was employed in this study. In the previous validation study for SHAPS, the Montgomery-Asberg depression rating scale (MADRS) (7), the short Parkinson’s evaluation scale (SPES) depression item (11), and the physical anhedonia scale (PAS) (12) were employed to independently assess anhedonia. Other than the SPES depression item, which is a scale rather than an individual item, scores obtained using the other scales were used for assessment of correlation with the score obtained using SHAPS (7, 12). However, because there is no Japanese version of an established scale for anhedonia, we could not avoid employing UPDRS Part I Item 4 (Motivation/Initiative), which was originally treated as an apathy scale, for the assessment of validity. Although the evaluation method used in this study was less precise than that used in previous studies (7, 12), good correlation was observed; moreover, our results were similar to those reported by previous studies (7, 11, 12).

In the present study, test-retest reliability was evaluated by Cohen’s kappa coefficient. This coefficient was also employed in the evaluation of the Italian SHAPS test (12). Cohen’s kappa coefficient measured in the present study was almost 0.5-0.8, and this value was slightly lower than that reported by a previous Italian study (12). One of the reasons for this discrepancy may be the difference in sample size and/or enrolled patients. The sample size in our study was smaller than that of the Italian study. Although almost the
same number of patients with depressive and non-depressive PD participated in the Italian study, our study did not enroll depressive patients selectively. Further, the mean score of SHAPS in the PD group in this study was lower than that in the Italian study. However, there is no definite, standard threshold value for Cohen’s kappa coefficient, and >0.2 is considered a fair measure of test-retest reliability (17). Good test-retest reliability was therefore observed in this study, because Cohen’s kappa coefficient for all items was >0.3, and it was statistically significant.

Cronbach’s alpha coefficient in this study was almost 0.90. In previous studies, Cronbach’s alpha coefficient in the original SHAPS and in a German study were 0.857 and 0.87, respectively (7, 11), which is in good agreement with the results of our study. Considering that there were no definite criteria for evaluation, good internal consistency was observed in our study.

As described above, Item 6 (including smelling) and Item 8 (including the factor of movement) are related to parkinsonian symptoms. Hyposmia has reportedly been observed in patients with PD (18), and motor impairment is the main symptom of PD. Physicians must thus pay attention to over-diagnosis of anhedonia. However, it may be difficult to consider whether these 2 items should be excluded for the use of SHAPS in PD. If these items are excluded, the detection power of anhedonia must be verified in their absence.

In conclusion, it can be suggested that SHAPS-J is a suitable scale in Japanese for anhedonia. We believe that SHAPS-J can be used widely in routine clinical work. However, physicians must monitor the use of SHAPS-J for PD, because SHAPS includes some items that are related to the symptoms observed in PD.

The authors state that they have no Conflict of Interest (COI).

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References


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