2017

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T Nishigami

A Mibu

K Tanaka

Y Yamashita

M Shimizu

See next page for additional authors

Article type : Original Manuscript

Validation of the Japanese Version of the Fremantle Back Awareness Questionnaire in Patients with Low Back Pain

Tomokiko Nishigami[1,*]; Akira Mibu[2,3]; Katsuyoshi Tanaka[2]; Yuh Yamashita[4]; Michele Eisemann Shimizu[5]; Bennedict Wand[6]; Mark J. Catley[7]; Tasha R. Stanton[8,9]; and G. Lorimer Moseley[7,9]

[1]Department of Nursing and Physical Therapy, Konan Woman's University, Kobe, Hyogo, Japan
[2]Department of Rehabilitation, Tanabe Orthopedics, Osaka, Japan

[3]Department of Pain Medicine, Osakaq University Graduate School of Medicine, Suita Osaka, Japan
[4]Department of Rehabilitation, Morinaga Orthopedic Clinic, Saga, Japan
[5]University Medical Center, Prefectural University of Hiroshima, Hiroshima, Japan
[6]Department School of Health Sciences, University of Notre Dame, Perth, Western Australia, Australia
[7]Sansom Institute for Health Research, University of South Australia, Adelaide, South Australia, Australia
[8]School of Health Sciences, University of South Australia, Adelaide, South Australia, Australia
[9]Neuroscience Research Australia, Sydney, New South Wales, Australia

[*]Address correspondence and reprint requests to Tomokiko Nishigami, Department of Nursing and Physical Therapy, Konan Woman's University, 6-2-23, Morikita-machi, Higashinada-ku, Kobe, Hyogo 658-0001, Japan.

Article Type: ORIGINAL ARTICLE

Key Words: low back pain, body perception, Rasch analysis, reliability, validity

Running Head: Validation of the Japanese Version of the FreBAQ

Submitted: October 15, 2016; Revision accepted: February 28, 2017

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1111/papr.12586

Corresponding author email id: t-nishi@konan-wu.ac.jp

ACKNOWLEDGEMENTS

We thank Futoshi Hirose, Takenori Kobayashi, Yuta Yonemoto, and Hirofumi Yamashita for assistance with data collection. M.J.C. was supported by an Australian postgraduate award. G.L.M. was supported by National Health & Medical Research Council (NHMRC) Project Grant ID 1047317 and by a Principal Research Fellowship from the NHMRC of Australia ID 1061279. T.R.S. was supported by a National Health & Medical Research Council Early Career Fellowship (ID 1054041). This study was not financially supported.

ABSTRACT

Background

There is a growing interest in the role of disturbed body perception in people with persistent pain problems such as chronic low back pain (CLBP). A questionnaire, the Fremantle Back Awareness Questionnaire (FreBAQ), was recently developed as a simple and quick way of assessing disturbed perceptual awareness of the back in people with CLBP and appears to have acceptable psychometric properties. The aim of the present study was to develop a Japanese version of the FreBAQ (FreBAQ-J) and evaluate its psychometric properties in a sample of Japanese people with low back pain (LBP).

Methods

Translation of the FreBAQ into Japanese was conducted using a forward-backward method. One hundred participants with LBP completed the resultant FreBAQ-J. A subset of the participants completed the FreBAQ-J again 2 weeks later. Validity was investigated by examining the relationship between the FreBAQ-J and clinical valuables. Rasch analysis was used to assess targeting, category ordering, unidimensionality, person fit, internal consistency, and differential item functioning.

Results

The FreBAQ-J was significantly correlated with pain in motion, disability, pain-related catastrophizing, fear of movement, and anxiety symptomatology. The FreBAQ-J had acceptable internal consistency, a minor departure from unidimensionality, and good test-retest reliability, and was functional on the category rating scale.

Conclusions

The FreBAQ-J has acceptable psychometric properties and is suitable for use in people with LBP. Participants with high levels of disturbed body perception are well targeted by the scale. The functioning of one item (item 8) was poor. Further study is warranted to confirm if this item should be excluded.

INTRODUCTION

There is a growing interest in the role of disturbed body perception in people with persistent pain problems such as chronic low back pain (CLBP).[1–5] Neuroimaging studies of people with CLBP show structural and functional changes of cortical areas that are thought to subserve body perception.[6,7] Several studies have reported that people with CLBP feel a sense of alienation and rejection of the back[1,8] and represent the back differently when asked to draw how the back feels to them.[3,5] Furthermore, perpetual dysfunction such as decreased tactile acuity,[9] problems localizing sensory input,[10] degraded proprioceptive acuity,[11] reduced trunk motor imagery performance,[12,13] and spatially defined tactile processing deficits[4] also appear to be features of CLBP. Moreover, there are some data to suggest that strategies designed to improve self-perception might improve CLBP.[14–16]

The Fremantle Back Awareness Questionnaire (FreBAQ) was recently developed as a simple and quick way of assessing disturbed perceptual awareness of the back in people with CLBP.[17] The questionnaire is composed of 9 items that relate to neglect-like symptoms (items 1, 2, and 3), reduced proprioceptive acuity (items 4 and 5), and perceived body shape and size (items 6, 7, 8, and 9). The FreBAQ scores are associated with clinical variables including pain intensity, duration of pain, disability, and catastrophization, and the FreBAQ appears to have acceptable psychometric properties.[17,18] However, there is no Japanese version of the questionnaire. Therefore, the aim of the present study was to develop a Japanese version of the FreBAQ (FreBAQ-J) and evaluate its psychometric properties using the contemporary Rasch model.[19]

METHODS

Translation of the Questionnaire

Translation of the FreBAQ into Japanese was conducted using a forward-backward method.[20] First, 3 native Japanese speakers (T.N., A.M., and KT) translated the original FreBAQ items from English into Japanese. Where differences emerged in the meaning and clarity of translated items, they were discussed to reach consensus amongst the 3 translators. Second, the revised Japanese version was back-translated from Japanese to English by a native English speaker who was also fluent in Japanese (M.E.S.). Third, the back-translation was checked and approved by the developer of the original FreBAQ (B.W.), and a provisional version of the FreBAQ-J was created. Finally, the provisional FreBAQ-J was administered to 5 native Japanese patients with CLBP, who gave feedback on comprehensibility and completeness of the content and time exposure. Based on this feedback, we developed a final version of the FreBAQ-J (supplementary file).

Evaluation of the Questionnaire

Participants. Participants were recruited consecutively from 3 orthopedic clinics. The inclusion criteria were ages between 20 and 80 years and LBP for >3 months. The exclusion criteria were serious pathologies (unhealed fractures, tumors, acute trauma, or serious illness), neurological signs (muscle weakness, loss of sensation or reflexes), and any severe psychiatric disorders. Ethical approval was obtained from the institutional ethics committee of Konan Woman's University. Written informed consent was obtained from all participants before the study. The study was conducted in accordance with the Declaration of Helsinki.

Procedure. Demographic (age, gender, height, weight, work status) and clinical (pain duration, pain intensity, pain-related catastrophization, fear of movement, anxiety, depressive symptomatology, and back pain-related disability) information were assessed in all participants. Pain intensity at rest and during movement was measured using a 0 to 100 visual analog scale anchored at the left with “0 = no pain” and at the right with “100 = unbearable pain.” The level of pain-related catastrophizing was measured using the Japanese version of the Pain Catastrophizing Scale (PCS),[21,22] and the level of pain-related fear was estimated using the Japanese version of the Tampa Scale of Kinesiophobia (TSK).[23,24] We evaluated anxiety and depression with the Japanese version of the Hospital Anxiety and Depression Scale, which consists of 7 anxiety and 7 depression items, from which separate anxiety and depression scores are calculated.[25–27] Functional disability was measured using the Japanese-validated version of the Roland Morris disability questionnaire (RDQ).[28,29] In addition, participants completed the FreBAQ-J.

Sample Size. A sample size of 100 participants has been previously recommended for Rasch analysis, to ensure item calibration stability within ±0.5 logits with 95% confidence.[30]

Data Analyses. The correlation analysis was conducted with the Statistical Package for Social Sciences Version 22 (IBM SPSS Statistics for Windows, Version 22.0; IBM Corp., Armonk, NY, U.S.A.). A series of univariate correlations were performed to examine relationships between the FreBAQ-J total raw ordinal level scores and duration of LBP, pain intensity, disability, pain catastrophization, kinesiophobia, anxiety, and depression. These associations were investigated using Spearman's correlation coefficients.

Rasch Analysis

Rasch analysis was performed with the Andrich rating scale model using Winsteps software (v3.90.2; Winsteps, Chicago, IL, U.S.A.). We analyzed the FreBAQ-J and evaluated the following components.

Targeting. Targeting refers to how well the FreBAQ-J items targeted the participants. Rasch analysis is a probabilistic model that, in this instance, assumes people with greater perceptual disturbance will be more agreeable with the FreBAQ-J items than those with lesser perceptual disturbance, and items indicative of greater disturbance are less endorsable than those indicative of lesser disturbance. Thus, a scale is considered to target the sample well when the average agreeability of the sample is similar to the average endorsability of the items, which is anchored at 0 logits by the Rasch analysis software. We evaluated targeting by visual inspection of the distribution of person and item thresholds and consideration of the summary statistics. We also considered the presence of floor or ceiling effects.

Category Order. The FreBAQ-J has 5 response categories (0 = never, 1 = rarely, 2 = occasionally, 3 = often, 4 = always). Category probability curves were visually analyzed to explore the rating scale function. In a well-functioning rating scale, each curve has a distinct peak and 4 clear thresholds that represent the point at which the likelihood of endorsing one category is equal to that of endorsing the next. Disordered thresholds can occur if a category is underutilized or respondents use the categories in an unexpected manner (eg, respondents cannot differentiate between the categories).

Unidimensionality. Item fit statistics and principal component analysis (PCA) of residuals were used to assess unidimensionality. Fit statistics are chi-square-based statistics reported as mean squares (in logits), with an expected value of 1 logit. Excessively large fit residuals (>1.4 logits) indicate a large difference between the expected and observed performance of an item[31] and may indicate that the item is assessing a construct other than the intended construct. Excessively small fit residuals (<0.6 logits) indicate items that behave too predictably.[31] We compared both infit (information-weighted) and outfit (outlier-sensitive) statistics and inspected the item characteristic curves of misfitting items to determine how they behaved for participants of differing agreeability.

The PCA residual correlation matrix was visually inspected to identify clusters of items that would be suggestive of a second dimension. An eigenvalue greater than 2.0 for the PCA of residuals suggests a second dimension.[32] Response dependency between the items was examined by inspecting the residual correlation matrix[33] for pairs of items with correlations exceeding 0.4.[34,35]

Person Fit. Participants with outfit residuals greater than 1.5 logits were examined to determine the reason for poor fit.[36] Each item of the FreBAQ-J was compared between those with poor fit to those who fit the model using Fisher's exact test of significance[37] (gender, work status) or Student's *t*-test (age, pain intensity, disability). Response strings of misfitting participants were analyzed to identify patterns in their responses.

Internal Consistency. Rasch analysis uses the person reliability as an indicator of internal consistency and reliability. A minimum value of 0.7 is suggested for group use, and a minimum of

0.85 is suggested for individual use.[33] Cronbach's alpha was also investigated to compare to that of the original study.[17] The person reliability[33] and Cronbach's alpha[38] are analogous estimates of reliability and should exceed 0.7.[39]

Differential Item Functioning (DIF). Items should function in a similar manner for all people of similar levels of agreeability. DIF analysis identifies individual questionnaire items that may be biased by factors other than the construct that is intended to be measured. It compares each item separately and assumes the remaining items function identically. We assessed for DIF across 6 subgroups: gender, age (18 to 60, >60 years), work status (off work vs. at work), pain in motion (≤50, >50 mm), pain duration (≤1, >1 years) and disability (median split; RDQ score ≤5, >5). DIF was tested using a Mantel-Haenszel chi-square test[40] with significance set at $P = 0.01$ for each item. DIF was explored if an item yielded a significant difference of greater than 0.5 logits between subgroups.[41]

Differential Test Functioning (DTF). Questionnaires that have been translated should function in a similar manner to the original validated questionnaire. We assessed DTF by comparing the FreBAQ-J item measures to the FreBAQ data of 251 English-speaking people with CLBP (see reference 18 for participant demographics). DTF was explored if an item yielded a significant difference of greater than 0.5 logits between samples.

Test-Retest Reliability. FreBAQ-J reliability was assessed using scores obtained from a second round of the questionnaire administered to participants within 2 weeks of their first questionnaire completion. An intraclass correlation coefficient (ICC) 2-way mixed model with absolute agreement was used to determine measurement reliability. $ICC_{3,1}$ values of <0.40 were considered to indicate poor reliability, 0.40 to 0.75 fair to good reliability, and 0.75 to 1.00 excellent reliability.[42]

RESULTS

Translation of the FreBAQ to Japanese

In the translation process, item 9 (“My back feels lopsided [asymmetrical]”), posed some difficulties in simply expressing the idea of being lopsided and asymmetrical in Japanese. As a result of discussion with a native speaker, we translated item 9 as “My back feels different between right and left” and added the explanatory note “One side feels dull or fat or leaning.”

Following feedback from the 5 Japanese patients who piloted the questionnaire, the final Japanese version of the FreBAQ was developed. There was one point of discussion concerning item 4 (“When performing activities of daily living, I do not know how much my back is moving”) and item 5 (“When performing activities of daily living, I do not know what kind of position my back is in”). Patients were unsure what “activities of daily living” might indicate. Therefore, we added the explanatory note “housework, work, etc.”

Sample Characteristics

In total, 100 participants were recruited between September 2014 and April 2015. Participant characteristics are summarized in Table 1. Table 2 describes the frequency of responses for each item.

Relationship to Clinical Status

The FreBAQ-J was significantly correlated with pain in motion (rho = 0.25), RDQ (rho = 0.36), PCS (rho = 0.38), TSK (rho = 0.23), and anxiety (rho = 0.19) ($P < 0.05$ for all) (Table 3).

Rasch Analysis of the FreBAQ-J

Targeting. Figure 1 shows the relationship between FreBAQ-J items and person logit ratings. Table 4 shows the endorsability thresholds for each item. Overall, the sample was not well targeted by the FreBAQ-J. The average person endorsability was -0.88 logits (standard deviation [SD] 0.99, range -3.41 to 5.04), compared with a default item endorsability average of 0 logits (SD 0.59, range -1.02 to 0.91). That person agreeability was shifted to the left when compared with item endorsability indicated that participants with low levels of disturbed body perception were not targeted well by the scale. Item 9 was the easiest item for participants to endorse. Item 3 was the most difficult item to endorse. Only 1 participant (1%) scored 0 for all items; no participants scored full points on all items.

Category Order. The average agreeability measures of the respondents advanced as expected across the rating scale categories and there was neither excessive positive nor negative fit statistics, suggesting the category structure is adequate. However, category 1 (rarely) was underutilized, which suggests the respondents experienced difficulty differentiating “rarely” from “occasionally” (Figure 2).

Unidimensionality. Table 4 summarizes the fit statistics for the 9 items. Item 8 demonstrated slightly excessive positive infit statistics, and the item characteristic curve suggested the misfit was due to participants with higher levels of perceptual impairment scoring this item low.

PCA of residuals indicated that the unexplained variance of the first contrast was 2.3 eigenvalue units, and 52.0% of the raw unexplained variance was explained by the measures. Visual inspection of the PCA correlation matrix suggested items 4, 5, and 6 could plausibly constitute a second dimension. Two of these 3 items (items 4 and 5) belonged to the reduced proprioceptive subscale and 1 (item 6) to body size and shape.

Assessment of local dependence identified positive correlations (correlations exceeding 0.4) between items 5 and 6 ($r = 0.45$). This suggested that the responses to these items were dependent.

Internal Consistency. The person reliability was 0.76, and the Cronbach's alpha was 0.80, suggesting the FreBAQ-J has good internal consistency.

Person Fit. Analysis of person fit identified 20 participants (20%) with excessive positive outfit (>1.5 logits). No significant associations between those who fit vs. those who did not fit the Rasch model were found between gender ($P = 0.06$), work status ($P = 0.13$), pain intensity at rest ($P = 0.70$), pain in motion ($P = 0.43$), pain duration ($P = 0.22$), and RDQ score ($P = 0.99$). However, participants with misfit were significantly older than those without misfit (mean difference 9.5 years older, $P = 0.002$). Although no significant associations were found between item 1 ($P = 0.09$), item 2 ($P = 0.30$), item 3 ($P = 0.26$), item 4 ($P = 0.39$), item 5 ($P = 0.73$), item 6 ($P = 0.95$), item 7 ($P = 0.82$), and item 8 ($P = 0.11$), participants who did not fit the Rasch model endorsed item 9 less frequently than those who did fit the Rasch model (mean difference 0.9, $P = 0.01$).

Differential Item Functioning. There was no differential item functioning for gender, age, work status, pain intensity, or pain duration. Participants with high levels of disability endorsed 1 item (item 2: $P < 0.01$) more often than those with low levels of disability. However, the difference between people with high and low levels of disability was only 0.36 logits, suggesting that further exploration was not needed.

Differential Test Functioning. Figure 3 compares the functioning of the FreBAQ-J to the FreBAQ. The Japanese participants in this study found item 6 significantly easier (0.63 logits) to endorse and items 3 and 7 significantly harder (0.52 and 0.82 logits, respectively) to endorse than English-speaking participants assessed with the FreBAQ in a previous study.[18]

Test-Retest Reliability. Amongst the participants who reported no change (the difference between first and second round of pain intensity during movement is under 10 mm) in LBP during the past 2 weeks (n = 40), there was excellent agreement between test and retest total raw ordinal level scores, with an $ICC_{3,1}$ of 0.81 (95% confidence interval [CI] 0.67–0.89].

DISCUSSION

We aimed to develop a Japanese version of the FreBAQ. We first translated the FreBAQ[17] from English to Japanese, ensured feasibility and utility, and then determined the psychometric properties of the new FreBAQ-J in a sample of Japanese people with CLBP. Our results showed that the FreBAQ-J had acceptable internal consistency; a minor departure from unidimensionality and good test-retest reliability. Only one participant (1%) scored zero and none had a full score, suggesting that the FreBAQ-J had neither floor nor ceiling effects. Although DIF between subgroups (disability) was significantly different, the scale showed DIF below 0.5 logits, indicating that the DIF was too small to have a meaningful impact on the practical application of the FreBAQ-J.[41] The DTF demonstrated that item hierarchy of the FreBAQ-J was mostly consistent with the English FreBAQ.[18] The internal consistency of the FreBAQ-J was good (Cronbach's alpha of 0.80) and aligned with the English FreBAQ[18] (Cronbach's alpha of 0.80). A person reliability of 0.76 suggests that it is suitable for group use. Although the test-retest reliability score in the English FreBAQ[17] was 0.65 (95% CI 0.30–0.84), the ICC score in the present study was 0.81 (95% CI 0.67–0.89), indicating the FreBAQ-J has excellent reliability. Overall, the FreBAQ-J showed adequate psychometric properties for use in evaluating distorted body perception of patients with LBP in the Japanese population.

The FreBAQ-J was positively associated with pain intensity in motion, disability, catastrophization, kinesiophobia, and anxiety. Although it was not a primary objective of the current project, the data do support previous suggestions that body perception disturbance is related to poor outcome,[2] and psychological distress.[18,43] This is also consistent with the English FreBAQ.[17] Interestingly, the current study did not show a relationship between body perception disturbance and pain duration, whereas the English FreBAQ did. This may be due to a shorter pain duration in our study population than in the population of the original study.[17] Even still, it suggests that perceptual disturbance is not simply a function of duration.

The Rasch analysis did suggest some minor shortcomings of the questionnaire. Items 5 and 6 demonstrated local dependence. High correlation of residuals for 2 items (correlations exceeding 0.4) tends to inflate person reliability. Item 5 ("When performing everyday tasks, I am not exactly sure what position my back is in") and item 6 ("I can't perceive the exact outline of my back") was included to capture problems with motion perception and to explore body perceptual problems. These 2 questions target different aspects of disturbed body perception and it may be useful to clinicians to retain these 2 questions separately.

The misfitting of older patients, which was also a feature of the English FreBAQ,[18] and poor targeting of those with minor or no body perception disturbance has clear implications for the use of the tool. Perhaps body perception is a more vulnerable or variable construct in older people, an idea that requires further exploration. In addition, the FreBAQ-J is potentially only useful for patients with moderate to high levels of disturbed body perception, though this may not be a problem because low levels of disturbed body perception are unlikely to be a contributor to distress and clinical status. On the other hand, poor targeting may negatively affect the person reliability, which indicates the ability of the questionnaire to distinguish distinct strata of body perception disturbance. Also, the sensitivity to change of the questionnaire may be limited, particularly the ability to detect improvement in those with only moderate levels of body perception disturbance, because the FreBAQ-J does not include questions targeting low levels of body perception disturbance. Further refinement would be required to optimize the measurement performance of the tool, such as inserting additional, well-targeted items.

We noted item 8 ("My back feels like it has shrunk") showed slightly excessive misfit and was the most difficult item to endorse. Analysis of the English FreBAQ reported the same issue, noting some of the sample with relatively high perceptual impairments were scoring item 7 ("My back feels like it is enlarged [swollen]") in preference to item 8.[18] This is understandable as both these items relate to the perceived size of the back, but in opposite directions. While it is plausible that a person could feel both an enlargement and a shrinkage of the back at different times, our results support the English FreBAQ data, showing most people experience feelings of enlargement but not shrinkage.[18] Assessment of local dependence did not identify a correlation between item 7 and item 8, supporting the idea that participants independently chose between these items. That some people do feel a shrinkage, however, lends support to the notion that item 8 is a clinically valuable inclusion in the scale,[18] and probably should be retained.

The FreBAQ was initially thought to be composed of 3 related factors: neglect-like symptoms (items 1, 2, and 3), reduced proprioceptive acuity (items 4 and 5), and body size and shape (items 6, 7, 8, and 9).[17] PCA analysis of residuals suggests the presence of a second dimension that includes items 4, 5, and 6. These data are consistent with the analysis of the English FreBAQ, which queried a possible second dimension consisting of the same 3 items.[18] It is possible that these items interrogate proprioceptive acuity as a construct that is distinct from body size and shape issues. However, the exclusion of items 4, 5, and 6 is probably premature, because concerns about reduced proprioceptive acuity may still provide important information for clinicians. Several studies have demonstrated that patients with CLBP have relatively poor proprioception,[44–46] and specific movement and balance training improves their performance[47–49] (of course, this is not limited to those with CLBP[50–52]). Further investigation into the function of these items is needed.

One interesting and unexpected finding that is worthy of further a priori investigation is that item 2 ("I need to focus all my attention on my back to make it move the way I want it to") was endorsed more often by people with high levels of disability than it was by people with low levels of disability. That is, more disabled patients found it easier to endorse item 2. Perhaps this relates to the possibility of a working memory deficit[53] or poor executive function[54] in people disabled by pain. The difference on item 2, between people with high and low levels of disability, was below 0.5 logits, which is why we did not remove it, but it would certainly seem worthwhile to investigate the source of this differential item functioning and its relevance for clinical management.

Item hierarchy of the FreBAQ-J was similar but not identical to the English FreBAQ. Both studies reported high item reliability values, suggesting the hierarchies of each are reproducible. The Japanese participants found item 7 harder to endorse and items 6 and 8 easier to endorse. Differences in item hierarchy may reflect cultural/translational differences, though it is interesting that all 3 items are concerned with body size and shape so may represent some clinical variability between the 2 populations.

Interpretation of the current study should consider its limitations. First, our data did not include participants' educational level. Level of education is an important factor in LBP[55] and might impact on perceptual dysfunction in LBP. Second, we did not investigate the sensitivity of the FreBAQ-J to changes in clinical status, so we are not in a position to make conclusions about causation, predictive validity, or response to intervention. Such issues would seem sensible next steps for research into the FreBAQ-J.

CONCLUSION

The FreBAQ-J has acceptable psychometric properties and is suitable for use in patients with CLBP. Participants with high levels of disturbed body perception are well targeted by the scale. The functioning of 1 item (item 8) was poor. Further study is warranted to confirm if this item should be excluded.

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Figure 1. Item-person threshold map.

Figure 2. Probability curves for the 5-category Japanese version of the Fremantle Back Awareness Questionnaire. C0, never; C1, rarely; C2, occasionally; C3, sometimes; C4, always).

Figure 3. Scatterplot comparing the item measures of the Japanese version of the Fremantle Back Awareness Questionnaire (100 Japanese-speaking respondents with chronic low back pain) and English version of the Fremantle Back Awareness Questionnaire (251 English-speaking respondents with chronic low back pain.[18] The dashed line represents the Rasch modeled line of commonality and the adjacent lines represent the upper and lower 95% confidence intervals.

Table 1. Demographic and Clinical Information

Characteristics	LBP Mean (SD) or *n* (%)
Demographic information	
Gender (female)	64 (64%)
Age (years)	56.0 (16.4)
Height (cm)	160.1 (8.2)
Weight (kg)	57.8 (10.8)
Work	
Off work	46 (46%)
Mainly sitting	25 (25%)
Physical work	29 (29%)
Clinical status	
Duration of pain (years)	7.4 (8.9)
LBP intensity/100	
Rest	23.3 (23.6)
Motion	49.1 (27.1)
Disabilty (RDQ)	6.3 (4.4)
Catastrophization (PCS)	22.9 (9.5)
Kinesiophobia (TSK)	39.7 (5.2)
Anxiety (HADS)	6.3 (3.6)
Depression (HADS)	5.6 (3.0)
FreBAQ-J	11.7 (6.4)

LBP, low back pain; RDQ, Roland Morris Disability Questionnaire; PCS, Pain Catastrophizing Scale; TSK, Tampa Scale of Kinesiophobia; HADS, Hospital Anxiety and Depression Scale.

Table 2. Frequency of Rresponses to Each Item of the Japanese Version of the Fremantle Back Awareness QuestionnaireFreBAQ-J

Item	Never (*n*)	Rarely (*n*N)	Occasionally (*n*N)	Often (*n*N)	Always (*n*N)	Median (Score)	Mean (Score)
1. I feel like my back is not part of my own body	39	28	21	9	3	1	1.0
2. To move my back the way I want to, I feel like I have to concentrate all my nerves there	18	30	33	13	6	2	1.5
3. Sometimes I feel like my back moves without any connection to what I intend it to do.	59	23	13	5	0	0	0.6
4. When performing activities of daily living (housework, work, etc.), I do not know how much my back is moving	38	25	17	15	5	1	1.2
5. When performing activities of daily living (housework, work, etc.), I do not know what kind of position my back is in	22	25	28	18	7	2	1.6
6. I cannot image my back's contour correctly	21	30	21	14	14	1	1.7
7. I feel like my back is bigger (swollen)	58	20	9	12	1	0	0.8
8. I feel like my back has shrunk	47	28	14	10	1	1	0.9
9. My back feels differences with right and left. (Oone side feels dull or fat or leaning)	13	19	24	26	18	2	2.2
Total						10	11.7

Table 3. Correlations Between the Total Score of the Japanese Version of the Fremantle Back Awareness Questionnaire and Clinical Variables

	Correlation coefficient (Rho)	*P* value
Duration of LBP	-0.08	0.41
LBP intensity		
Rest	0.05	0.61
Motion	0.25	0.01
Disability (RDQ)	0.36	< 0.001
Catastrophization (PCS)	0.38	< 0.001
Kinesiophobia (TSK)	0.23	0.01
Anxiety (HADS)	0.19	0.04
Depression (HADS)	0.15	0.13

LBP, low back pain; RDQ, Roland Morris Disability Questionnaire; PCS, Pain Catastrophizing Scale; TSK, Tampa Scale of Kinesiophobia; HADS, Hospital Anxiety and Depression Scale.

Table 4. Average Item Endorsability Thresholds, Including Fit Statistics

mnsq, .

Item	Measure (Logits)	SE	Infit (mnsq)	Outfit (mnsq)
9	-1.02	0.11	1.39	1.38
6	-0.50	0.11	0.96	0.91
5	-0.42	0.11	0.67	0.65
2	-0.38	0.11	0.98	1.07
4	0.03	0.11	0.88	0.90
1	0.22	0.13	0.81	0.79
8	0.48	0.12	1.44	1.40
7	0.67	0.13	1.31	1.27
3	0.91	0.14	0.86	0.79