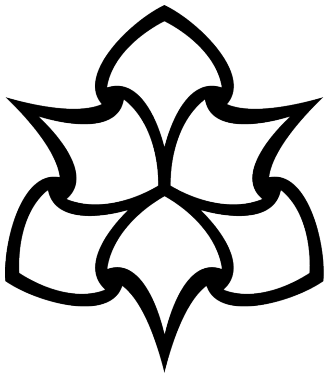

Validation of the Yoruba Version of the Pain Self-Efficacy Questionnaire in Patients with Chronic Low Back Pain

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Study Design. Cultural adaptation and psychometric analysis.
Objective. This study determined the test–retest reliability, acceptability, internal consistency, divergent validity of the Yoruba pain self-efficacy questionnaire (PSEQ-Y). It also examined the ceiling and floor effects and the small detectable change (SDC) of the PSEQ-Y among patients with chronic low back pain (LBP).
Summary of Background Data. There are various indigenous language translations of the PSEQ and none adapted to African language. However, translations of the PSEQ into Nigerian languages are not readily available.
Methods. The validity testing phase of the study involved 131 patients with LBP, while 83 patients with LBP took part in the reliability phase. Following the Beaton recommendation for cultural adaptation of instruments, the PSEQ was adapted into the Yoruba language. The psychometric properties of the PSEQ-Y determined comprised: internal consistency, divergent validity, test–retest reliability, and SDC.
Results. The mean age of the participants was 52.96 ± 17.3 years. The PSEQ-Y did not correlate with the Yoruba version of Visual Analogue Scale (VAS-Y) scores ($r = -0.05$; $P = 0.59$). The values for the internal consistency and the test–retest reliability of the PSEQ-Y were 0.79 and 0.86, with the 95% confidence interval of the test–retest reliability ranging between 0.82 and 0.90. The standard error of measurement (SEM) and the SDC of the PSEQ-Y were 1.2 and 3.3, respectively. The PSEQ-Y had no floor or ceiling effect, as none of the respondents scored either the minimal or maximal scores.
Conclusion. This is the first study in Nigeria to culturally adapt PSEQ. The PSEQ-Y showed adequate psychometric properties similar to existing versions. Therefore, the tool can be used to assess pain self-efficacy in clinical and research settings and help to improve the health outcomes of patients chronic LBP.
Key words: cultural adaptation, low back pain, pain self-efficacy, validation.
Level of Evidence: 3

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Self-efficacy reflects beliefs about what one can achieve within given resources in a variety of situations. The concept of self-efficacy refers to personal convictions in one's ability to engage successfully in specific behaviors that will lead to specific, desired outcomes.[1] For instance, self-efficacy during pain experience, otherwise known as pain self-efficacy, refers to one's ability to persist and succeed with a task despite the pain. While people suffering from pain should engage in behaviors (such as physical activity) that promotes health, pain, reduces fear of pain or both may alter their judgments regarding their ability to engage in such behavior.[2] Thus, highly skilled individuals with abundant and healthy behavioral resources may engage in such behavior sub-optimally if they doubt their abilities.[3] Self-efficacy beliefs not only influence the physical and psychological function of an individual with chronic pain, but it also affects the use of pain coping strategies and rehabilitation outcomes.[4–7] Thus, it is essential to accord pain self-efficacy sufficient attention in terms of evaluation and treatment during the rehabilitation of a person with chronic pain.

Miles *et al*[8] conducted a systematic review to identify all questionnaires that evaluate pain self-efficacy. Among those

identified, only the pain self-efficacy questionnaire (PSEQ)[9] and the self-efficacy scale[10] specifically asked patients to take pain into account when responding. Of the two questionnaires, the PSEQ has better psychometric properties including adequate internal consistency, content validity, and construct validity.[8]

The original version PSEQ was developed and validated in English.[9] It is a well-known self-report measure used across various cultures, in different clinics, and research settings for assessing self-efficacy beliefs in people with chronic pain.[9,11,12] There is diversity in the expression of pain and use of various healthcare systems across cultural groups.[13,14] Further, the subjectivity in various language expressions of pain calls for the translation of standard questionnaires into different languages. Considering the cultural sensitivity of the PSEQ, therefore, it is necessary to translate and adapt the instrument to other languages. Guillemin *et al*[14] have advocated that clinicians and researchers without a suitable pain measurement instrument in their language should either develop a new measure or adapt an existing validated measure to suit the target audience. This process of adapt an existing validated measure to suit the target audience refers to the cross-cultural adaptation process. There are various indigenous language translations of the PSEQ.[11,15–20] The original version of the PSEQ[9] and these available translations have shown to have good psychometric properties.

Chronic pain is prevalent in Nigeria population.[21–23] One of the intervention mapping to reduce pain is pain self-efficacy.[24] However, translations of the PSEQ into Nigerian languages are not readily available. Nigeria is a multilingual and multiethnic country where a sizeable number of patients do not speak or write the English language.[25] Yoruba is spoken in the West African countries of Nigeria, Benin Republic, and parts of Togo and Sierra Leone, therefore constituting one of the largest single languages in sub-Saharan Africa.[26] Yoruba is also spoken in Cuba and Brazil. Meanwhile, the Yoruba language is one of the most widely spoken languages in Nigeria and the number of speakers of Yoruba is estimated between 30 and 40 million, primarily by the ethnic Yoruba people.[27] The existence and adaptation of the PSEQ in one version do not guarantee measurement equivalence across other populations. To date, the PSEQ has not been culturally adapted into any African language. Translating PSEQ into an African language such as Yoruba widely spoken in Nigeria may assist in intervention mapping strategies to reduce pain and its burden in these countries.[24] In addition, there is a dearth of a culturally adapted PSEQ with accompanying empirical psychometric properties in any Nigerian language. This study culturally adapted and determined the psychometric properties of the Yoruba version of the PSEQ (PSEQ-Y).

METHODS

Design and Participants

The study is a cross-sectional psychometric evaluation. Based on a recommendation of 5 to 10 test subjects per item,[28] the final version (PSEQ-Y) was administered on a sample of 131 and 83 participants with non-specific chronic low back pain (LBP) for internal consistency and test–retest reliability aspects of this study, respectively. The participants were purposively recruited from the physiotherapy departments of Obafemi Awolowo University Teaching Hospital Complex Ile-Ife, University College Hospital, Ibadan and University of Ilorin Teaching Hospital, Ilorin. Individuals with non-specific chronic LBP, 18 years and older, literate in both English and Yoruba languages and not having cognitive or mental impairment were eligible to take part in the psychometric evaluation phase of the study. Exclusion criteria included individuals aged below 18 years and with comorbidities that may have influenced their overall wellbeing (such as sickle cell anaemia, HIV/AIDS, those with mental health related problems), and pregnant women with chronic LBP. The authors explained the purpose and procedure of the study to each participant and obtained their informed consent. This study was approved by the Health Research and Ethics Committee of Obafemi Awolowo University Teaching Hospital Complex, Ile-Ife.

Translation Procedure

Using a stepwise method and Beaton criteria, the authors translated the English version of the PSEQ (PSEQ-E) into the Yoruba language.[18,29] The translation took place at the Department of Linguistics and African Languages of Obafemi Awolowo University, Ile Ife, Nigeria. The translation procedure aimed at attaining a semantic, idiomatic, experiential, and conceptual equivalent version of the original instrument. Four native Yoruba speakers, fluent in English language and a Yoruba language expert forward-translated the English version of the PSEQ into the Yoruba language. The five translators worked independently to produce five initial colloquial Yoruba versions of the PSEQ, which were compatible with a reading age level of 18 years. After that, three fluent Yoruba language speakers (independent of the initial forward-translators) merged the initial translations into a single version. Two bilingual and bicultural (English and Yoruba) professional translators back-translated the merged Yoruba version into the English language. Two of the native Yoruba speakers involved in the forward translation process compared the back translation to the source version. An expert panel comprising the initial forward translators and the two back translators resolved any discrepancies between the forward and back translations to produce a consensus version of the PSEQ.

Further, the authors administered the consensus version to 10 participants with non-specific chronic LBP. The purpose of the pilot-testing was to get to know respondents' perceptions, understanding, and interpretation of translated items and the terminology used in the Yoruba version of the self-administered questionnaire. The 10 participants then undertook a cognitive debriefing to further refine the translated version in terms of words used in the questionnaire. The authors subsequently subjected the final Yoruba version of the PSEQ (PSEQ-Y) to psychometric testing (see attached,

Supplemental Digital Content 1, showing the Yoruba version of PSEQ, http://links.lww.com/BRS/B693).

Reliability/Validity

We assessed divergent validity by administering the PSEQ-Y and the Yoruba version of Visual Analogue Scale (VAS-Y) to the patients concurrently during the same measurement session. The questionnaires were hand-delivered to the participants. Seven days later, the researchers carried out a retest of the PSEQ-Y on the patients to assess reliability. Psychometric properties such as internal consistency, reliability, Ceiling, and floor effects were evaluated.

Instruments

The English Version of the PSEQ

The PSEQ, developed by Nicholas[30] (available at www.anaesthesia-analgesia.org, see Supplemental Digital Content 1 for Yoruba version, http://links.lww.com/BRS/B693), a pen and paper outcome instrument; assesses pain self-efficacy and comprises 10 items representing different daily activities (*e.g.*, "I can do most of the household chores").[9] A patient rates how confident he or she has in performing each activity despite the pain. The PSEQ rates items on a Likert scale that ranges from 0 to 6. The total possible highest and lower scores for the PSEQ are 60 and 0 points, respectively with a higher score implying higher pain self-efficacy.

For easy of reference, the 10 questions of English and Yoruba PSEQ are printed side by side in appendix 1, http://links.lww.com/BRS/B692.

The Yoruba Version of the Visual Analogue Scale (Yoruba-VAS)

The VAS represents the intensity of pain by a 10 cm line with two anchors of "no pain" and "the worst pain I ever felt."[31] Odole and Akinpelu[32] reported a moderate correlation ($r = 0.63$ [CI 0.49–0.69, $P < 0.05$]) between the English version and the translated Yoruba version of VAS.

Data Analysis

Data were analyzed using descriptive statistics of mean, standard deviation, and percentages. The PSEQ-Y was regarded to be acceptable by participants when the proportion of "no" responses for the overall items and each item was lower than 5%, and disputable if the proportion was higher than 10%. Spearman rho correlation analysis was used to determine the divergent validity of the PSEQ-Y. The divergent validity was done by correlating the PSEQ-Y with the VAS-Y. A priori hypothesis that there would be no association between PSEQ-Y and VAS-Y was assumed. Good divergent validity is achieved if hypothesis was specified in advance and at least 75% of the results were in correspondence with this hypothesis.[33] Cronbach α was used to determine the internal consistency of the PSEQ-Y. A Cronbach α of 0.7 and above is recommended for outcome measures.[33] The Intraclass Correlation Coefficient (ICC2, k) was used to determine the test–retest reliability of the PSEQ-Y. This approach of the ICC used in this study is premised on the probability that measurement errors could emanate from the study participants.[33] An ICC 0.7 is acceptable for outcome measures.[33]

Further, standard error of measurement (SEM) and the minimal detectable change (MDC) were used to explore the reliability of the instrument. Also, limits of agreement between test and retest of the PSEQ-Y were shown with the Bland Altman plots. Ceiling and floor effects are considered to be present if more than 15% of respondents had the lowest and highest possible scores, respectively.[33] The analysis was carried out using SPSS (Statistical Package for Social Sciences) version 22, with the alpha level set at 0.05.

RESULTS

Cultural Adaptation Reports

The cross-cultural adaptation was straight forward. During the expert panel, the item 7, "I can cope with my pain without medication" was modified. Item 7 was modified to include "Mo lè mu ìrora mi mora lái lo oògùn oyinbo." The word "oògùn" has many meanings in the Yoruba context which could mean charms or orthodox medicine, therefore its expedient to make the clarification by importing "oyinbo" which translates to medication. All of the items of the questionnaire were culturally acceptable as participants did not find any item offensive. There was also no need to for a further refining of the PSEQ-Y.

Physical Characteristics

The mean age, weight, height, and BMI of participants ($N = 131$) was 51.92 ± 16.1 years, 74.63 ± 6.3 kg, 1.60 ± 0.06 m, 29.20 ± 1.91 kg/m^2, respectively. Sixty-six respondents (50.4%) were females.

Reliability/Validity

The respondents found the PSEQ-Y easy to fill out and understandable as response rate of 100% with no missing items in the questionnaires was achieved. The Cronbach α coefficient of the PSEQ-Y was 0.79. The total item Cronbach α of the PSEQ-Y and its Cronbach α if item deleted are compared with those of other language translations in Table 1. Spearman ranks correlation coefficient for the divergent validity of the PSEQ-Y using the Yoruba version of visual analogue scale was $r = -0.05$ ($P = 0.59$). The test–retest reliability of the PSEQ-Y within a 1-week interval was 0.86 (95% confidence interval: 0.82–0.90). The translated items of the PSEQ-Y and item by item intra-class correlation are presented in Table 2. Figure 1 shows the Bland Altman's limits of agreement of the PSEQ-Y test–retest (upper limit: [+1.96 SD]: 3.54; mean: 0.10; lower limit: [−1.96 SD]: −3.35). All observations (except for five outliers) were gathered around the zero-line indicating no systematic difference between measurements. The SEM and MDC of the PSEQ-Y were 1.23 and 3.41, respectively. The PSEQ-Y had no floor or ceiling effect, as none of the respondents scored either the minimum or maximum scores.

TABLE 1. Comparison Between the Cronbach α of the Yoruba Pain Self-Efficacy (N = 131) and that of Previous Translations

	Cronbach α of the PSEQ-Y Total Scale							
	Our Sample	Portuguese (Portugal)	English (Australia)	Portuguese (Brazil)	Cantonese (China)	Persian-Language (Iran)	Japanese (Japan)	Catalan (Spain)
	0.79	0.88	0.92	0.90	0.93	0.92	0.94	0.92
	Cronbach α of the PSEQ-Y If One Item is Deleted (Item Total Correlation)							
PSEQ Items	Our Sample	Portuguese (Portugal)	English (Australia)	Portuguese (Brazil)	Cantonese (China)	Persian-Language (Iran)	Japanese (Japan)	Catalan (Spain)
1	0.78 (0.40)	0.87 (0.48)	−(0.70)	−(0.79)	0.92 (0.72)	–	0.93 (-)	0.91
2	0.78 (0.42)	0.86 (0.56)	−(0.72)	−(0.73)	0.92 (0.71)	–	0.93 (-)	0.91
3	0.77 (0.53)	0.86 (0.61)	−(0.71)	−(0.67)	0.92 (0.66)	–	0.93 (-)	0.91
4	0.76 (0.54)	0.85 (0.70)	−(0.83)	−(0.71)	0.92 (0.66)	–	0.93 (-)	0.91
5	0.76 (0.55)	0.86 (0.61)	−(0.74)	−(0.76)	0.92 (0.71)	–	0.93 (-)	0.92
6	0.77 (0.50)	0.85 (0.67)	−(0.79)	−(0.77)	0.92 (0.81)	–	0.93 (-)	0.90
7	0.79 (0.32)	0.88 (0.43)	−(0.67)	−(0.50)	0.93 (0.62)	–	0.93 (-)	0.93
8	0.78 (0.36)	0.86 (0.62)	−(0.79)	−(0.82)	0.92 (0.80)	–	0.93 (-)	0.91
9	0.76 (0.57)	0.85 (0.72)	−(0.84)	−(0.80)	0.92 (0.78)	–	0.93 (-)	0.90
10	0.77 (0.52)	0.86 (0.63)	−(0.84)	−(0.79)	0.92 (0.75)	–	0.93 (-)	0.91

PSEQ-Y indicates Yoruba pain self-efficacy questionnaire.

DISCUSSION

This study provided reports on translation, cultural adaptation, and validation of the Yoruba version of the PSEQ using the Beaton criteria, the basis for the translation, cultural adaptation, and validation of outcome measurement questionnaires. To our knowledge this is the first study to translate and culturally adapt PSEQ into an African language. The respondents found the PSEQ-Y easy to fill out and understandable. The layout of the source PSEQ was unchanged, with all its 10 items maintained. Based on difficulty and quality rating, the PSEQ-Y had a reasonable completion rate, with useful quality data obtained in terms of self-administration among people with LBP. A response rate of 100% with no missing items in the questionnaires retrieved from the participants suggested that the PSEQ-Y is an adequate outcome measure in the Yoruba speaking LBP population. This may be because the questionnaires were hand-delivered to the participants owing to difficulties encountered in using electronic mails or postal deliveries in Nigeria.

The internal consistency of the PSEQ-Y was within acceptable limits, howbeit lower than those of previous translations.[33] A Cronbach α more than or equal to 0.7 is mostly acceptable for the internal consistency of pen and

TABLE 2. Item by Item Correlation Between the Test–Retest of the Pain Self-Efficacy (N = 83)

Item	Intra Class Correlation	95% Confidence Interval	
		Lower Bound	Upper Bound
1. Mo ń gbádùn àwon ohun tí mò ń se bí ó tilè jé pé mo ní ìrora.	0.92	0.87	0.95
2. Mo le se òpòlopò gbogbo isé ilé (bíi pípalèmó, fífo abó abbl) bí ó tilè jé pé mo ní ìrora.	0.78	0.77	0.89
3. Mo lè wà pèlú àwon òré tàbí ebí mi bí mo se máa ń se, bí ó tilè jé pé mo ní ìrora.	0.87	0.81	0.91
4. Mo lè se àwon isé mi bí ó ti ye ní gbogbo ìgbà bí ó tilè jé pé mo ní ìrora.	0.81	0.73	0.87
5. Mo lè se àwon ìsé kan bí ó tilè jé pé mo ní ìrora (bóyá isé owó ni tàbí èyí tíkìí sesé owó).	0.81	0.74	0.87
6. Mo sì lè se àwon nnkan tí inú mi máa ń dùn sí, láti se àwon ohun ìgbafé bí ó tilè jé pé mo ní ìrora.	0.81	0.73	0.86
7. Mo lè wà pèlú ìrora mi lâì lo oògùn òyìnbó Kankan	0.87	0.81	0.91
8. Mo sì ń lè se àwon ohun tí mo pinnu láti se láyé bí ó tilè jé pé mo ní ìrora.	0.91	0.88	0.94
9. Mo sì ń gbé ìgbé-ayé mi bó se ye bí ó tilè jé pé mo ní ìrora.	0.88	0.83	0.91
10. Mò ń lè se àwon isé dîè dîè bí ó tilè jé pé mo ní ìrora.	0.91	0.87	0.93

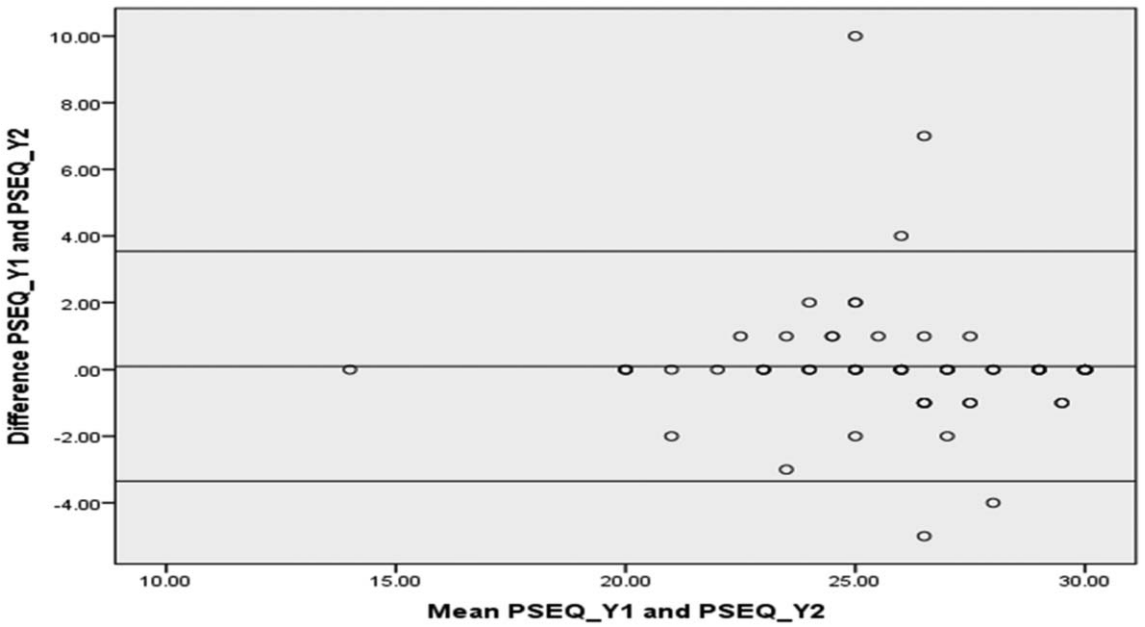

Figure 1. Mean PSEQ_Y1 and PSEQ_Y2 = mean scores of the first and second administrations of the PSEQ-Y. Difference PSEQ_Y1 and PSEQ_Y2 = difference in total scores of the first and second administrations of the PSEQ-Y. PSEQ-Y indicates Yoruba pain self-efficacy questionnaire.

paper instruments.[33] The internal consistency of the PSEQ-Y was similar to those of the existing language translations, including the Portuguese (0.88), Australian English (0.92), Brazilian (0.9), Japanese (0.94) and Iranian (0.92).[16,17,19,34] The Cronbach α if any of the PSEQ-Y 10 items were deleted was comparable to the overall Cronbach α. Thus, the removal of any item on the PSEQ-Y would not diminish the reliability of the measure.

The Yoruba PSEQ demonstrated a high overall test–retest reliability of 0.86. The ICCs of individual items ranged from 0.78 to 0.92. The overall test–retest reliability is consistent with the other language translations of the PSEQ (Dutch [0.76], Danish [0.89], simplified Chinese [0.91], Chinese [0.75], Italian [0.82]).[11,15,18,35,36] Based on the criteria proposed by Terwee *et al*,[33] an ICC of 0.7 between test and retest scores of an instrument indicated that such an instrument had considerable reliability. The Bland–Altman analysis revealed good agreement between test and retest scores, with no association between measurement error and the magnitude of the measurement. Taking into consideration the limits of agreement and the MDC (3.41 points) found in this study, only a change beyond the 3.41 points on the PSEQ-Y can be considered as a "real" change on the construct pain self-efficacy in patients with chronic LBP. The aforementioned provides a piece of essential information regarding the change attributable to measurement error.

Furthermore, the PSEQ-Y did not show any ceiling or floor effect. Ceiling or floor effects occur when a large proportion of participants score maximum or minimum scores obtainable. Generally, a ceiling/floor effect in orthopedic community is usually defined as 15% of participants in a sample score the possible maximum or minimum scores attainable.[37] The observation of no ceiling effect was similar to a previous study.[38] This observation of no ceiling/floor effects suggest that PSEQ-Y can discriminate between participants at either extreme of the scale and further confirmed the good psychometric property of the scale.

We observed a weak negative correlation of PSEQ-Y with VAS-Y though not significant. This was consistent with other language translations of PSEQ.[16,17,19] Studies usually set stringent *P*-value ($P < 0.001$) because of interrelationship between pain intensity and pain self-efficacy beliefs and might be the reason for non-significant. This observation might suggest that though pain intensity is reflected in pain self-efficacy beliefs to some extent, other factors might contribute to pain self-efficacy beliefs. Generally, factors such as disability, anxiety, depression, and poor quality of life were implicated to be associated with pain self-efficacy beliefs.[16,17,19]

In summary, PSEQ-Y demonstrated good psychometric properties among Yoruba speaking population of chronic LBP. Therefore, the tool can be used to assess pain self-efficacy in clinical and research settings and may help to improve the health outcomes of patients with the condition.

Key Points

- First study to translate and culturally adapt PSEQ into an African language.
- PSEQ-Y retains the validity and reliability of original version.
- We recommend its use in clinical and research settings among Yoruba speaking LBP population.

Supplemental digital content is available for this article. Direct URL citations appearing in the printed text are provided in the HTML and PDF version of this article on the journal's Web site (www.spinejournal.com).

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