Translation, cultural adaptation, and psychometric testing of the Yoruba version of Fear-Avoidance Beliefs Questionnaire in patients with low-back pain

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ABSTRACT

Purpose: To translate, culturally adapt, and validate the Fear-Avoidance Beliefs Questionnaire into Yoruba language.

Materials and Methods: Translation and cultural adaptation of the Yoruba version of the Fear-Avoidance Beliefs Questionnaire was carried out following the Guillemin criteria. One hundred and thirty-one individuals with chronic low-back pain participated in the psychometric evaluation of the Yoruba language translation. Cronbach's alpha (α), principal component analysis, intra-class correlation, Bland–Altman analysis, Spearman rank correlation coefficient, and minimal detectable difference were used for the analysis. Alpha level was set at $p < 0.05$.

Results and Conclusion: The mean age of the respondents was 53.6 ± 11.6 years. The internal consistency of the Yoruba language version of the Fear Avoidance Beliefs Questionnaire yielded a Cronbach's alpha of 0.9. Principal component analysis yielded a three-factor structure including the "work", "beliefs related to work", and "physical activity" which accounted for 61.6% of variance in the Yoruba translation. Test–retest reliability of the Yoruba translation yielded an Intra class correlation coefficient 0.97 (0.95–0.98). The Yoruba Fear Avoidance Beliefs Questionnaire was poorly correlated with the Visual Analog Scale ($r = 0.01$) and Roland–Morris Disability Questionnaire ($r = 0.3$). The minimal detectable difference of the Yoruba translation was 7.0. The Yoruba Fear Avoidance Beliefs Questionnaire demonstrated excellent psychometric properties similar to existing versions and is appropriate for clinical use among Yoruba-speaking patients.

KEYWORDS: Validity; reliability; psychosocial; pain; outcome

➤ **IMPLICATIONS FOR REHABILITATION**

- The Fear-Avoidance Beliefs Questionnaire is a culturally sensitive psychosocial outcome measure, necessitating its existence, and adaptation into different languages.
- The instrument was translated and culturally adapted into the Yoruba language following the Guillemin criteria.
- The Yoruba translation demonstrated excellent internal consistency, test–retest reliability and weak correlations with the Visual analog scale and Roland–Morris Disability Scale.
- The Yoruba version of the Fear-Avoidance Beliefs Questionnaire can be used to assess fear-avoidance beliefs among Yoruba speaking patients with low-back pain.

Introduction

Multiple interactions that exist between psychosocial aspects of pain and cognitive performance are reported to influence pain assessment and management [1–4]. Accordingly, researchers, over the years, have examined the associations among psychosocial factors such as catastrophizing, coping responses, pain-related beliefs, and attributions and social factors; and each of pain severity and functional performance in persons with chronic pain and disabilities [5].

The evolution of the "psychosocial flags" concept introduced by Kendall and colleagues, was aimed to facilitate better understanding of psychosocial characteristics of pain [6]. Thus, the psychosocial flags model has been used to describe psychosocial prognostic factors that precipitate and perpetuate pain and work disability following the onset of musculoskeletal conditions [6,7]. Although these flags do not represent a definite diagnosis or constellation of symptoms, they serve as pointers to individuals that may have delayed recovery and may need additional support to return to work. These psychosocial flags comprise the red, orange, blue and black flags. While the red, orange, blue, and black flags help to identify serious medical or biological factors, mental health factors, work, or social factors and compensation or system factors, respectively; yellow flag allows for the identification of personal characteristics, problems, and social context of an individual with chronic pain, as well as how these factors influence recovery [7,8]. Additionally, as part of the psychosocial flags model, yellow flags cover a range of psychological factors that bother on perception, beliefs and behavior about pain. Psychosocial factors determine outcomes such as activity levels, participation, and work [9].

The importance of assessing psychosocial factors in pain management cannot be overemphasized. In response to the need, a gamut of tools not limited to Brief Pain Inventory [10], Family

Pain Questionnaire [11], McGill Pain Questionnaire [12], Psychosocial Pain Assessment Form [13], and Fear-Avoidance Beliefs Questionnaire (FABQ) [14] have been developed and validated for the assessment of psychosocial characteristics of pain. The FABQ which is based on the fear-avoidance model of exaggerated pain perception is widely used in the clinical and research settings [14]. The FABQ assesses patients' fear of pain and consequent avoidance of physical activity [14,15]. The FABQ, a clinically useful screening tool, helps to identify patients with high fear-avoidance beliefs and consequently more prone to long-term disability [14]. Management of patients with elevated FABQ scores require clinicians to tailor interventions which will address their high fear avoidance beliefs [14,15].

The FABQ consists of 16 items, with each item rated from 0 to 6. The questionnaire elicits information concerning what causes patient's pain and what aggravates it. Within the FABQ, two subscales exist, the work subscale (items 6, 7, 9, 10, 11, 12, and 15) and the physical activity subscale (items 2, 3, 4, and 5) which facilitates the identification of patients' belief about how work and physical activity affect their current pain. Higher scores on the FABQ are indicative of greater fear and avoidance beliefs. The administration of FABQ in the English language may not capture necessary information in determining the level of fear in relation to pain among non-English populations, and in communities with low literacy. Consequently, the FABQ has been translated into many languages such as Arabic [16], Spanish [17], French [18], Italian [19], Persian [20], and Japanese [21].

Not until recently was the FABQ translated into Hausa, one of the three major Nigerian languages [22]. It is envisaged that the use of FABQ among local Nigerian populations may be limited, considering that the psychosocial construct that it assesses have significant varied understanding and magnitude across cultures. To date, there seems to be no FABQ in the Yoruba language. The Yoruba ethnic group constitutes over 35 million people in total; with the majority being natives of Nigeria. The Yoruba tribe is about 21% of the total Nigerian population. The Yoruba tribe is also found in Benin Republic and some parts of Brazil [23]. There is a need to have a Yoruba translated version of the FABQ as this will enhance the use of the FABQ and its accessibility by the Yoruba-speaking patient. The objective of this study was therefore to translate and culturally adapt the Yoruba language version of FABQ, and also determining the internal consistency, factor structure, discriminant validity, test–retest reliability, as well as ceiling and floor effects of the translated version.

Materials and methods

Ethical consideration

Approval for this study was obtained from the Health Research and Ethnics Committee of the Institute of Public Health, Obafemi Awolowo University, Ile-Ife, Nigeria.

Translation phase

The English version of FABQ was translated into the Yoruba language using the Guillemin criteria [24]. The translation was done at the Department of Linguistics and African Languages of Obafemi Awolowo University, Ile-Ife, Nigeria. The English version of the FABQ was independently translated into the Yoruba language by two bilingual translators whose first language was Yoruba. The backward translation was carried out by two other expert bilingual translators. The forward translations and back translations were reviewed by an expert panel (comprising the two forward translators, an orthopedic physiotherapist, and an orthopedic surgeon) to produce a single, reconciled and harmonized version after consensus had been reached. Words or expression perceived to be inappropriate were replaced by culturally accepted/contextually relevant words or expressions. The clustering and ordering of items in the Yoruba FABQ were the same as that of the Original English version. In order to give the translated Yoruba FABQ, a conceptual equivalence to the English version, arrangement, and wording of some parts of the questionnaire were altered. The following cultural adaptations were made to the Yoruba FABQ:

1. The word "patient" was changed to "the person" receiving treatment. This adaptation was based on ethnoreligious sentiments linking the direct translation of the word "patient" to mean "sick people" which has a negative connotation in the study context.
2. The word 'compensation' in item 8 was literally translated as "*gbà-máà-bínú*" (i.e., take and don't be angry) as compensation is not a daily used word.

Pretesting stage

The consensus Yoruba FABQ was then administered to 15 persons with chronic low back pain (LBP). Thereafter, the patients participated in a cognitive debriefing interview. All the patients reported that they understood all the items and that there was no imprecision in the questionnaire.

Validation stage

Based on sample size ranges in previous studies on the translation of the FABQ [18,22], and also to accommodate for refusal to participate, attrition, and invalid data, a sample size of 160 was adopted for this study. Respondents for the validation stage were purposively recruited from four different hospitals with physiotherapy clinics in the South West zone of Nigeria. Patients who were 18 years and older, with nonspecific LBP of not less than three months, who were literate in Yoruba language and having no cognitive or mental impairments were eligible to participate in the study. Individuals with acute or sub-acute symptoms of LBP, with debilitating conditions such as blindness or amputation, with any systemic illness (tumors or rheumatologic diseases) or other comorbidities, were taken out from the survey. The respondents in this study were consenting patients attending the selected outpatients departments for their respective treatments and were purposively recruited having met the inclusion criteria.

A hundred and sixty consenting individuals responded positively to participate in the validation study and were all given the Yoruba FABQ, Visual Analogue Scale [25] and Roland–Morris Disability Questionnaire [26] to complete. The instruments were delivered to the participants by hand. A total of 160 questionnaires were self-administered to respondents for validity testing. One hundred and thirty one respondents (response rate = 81.2%) completed the questionnaires during the validation phase (19 consenting participants withdrew upon filling some of the instruments while 10 participants had incomplete questionnaires which were excluded from the study). All of the respondents that completed the questionnaires during the validation phase (131) were approached on the 7th day for the retest phase of the Yoruba FABQ. A 100% response rate was obtained during the test–retest phase of the study. Baseline general characteristics including age, height, weight and body mass index (BMI) of the participants

Table 1. General characteristics of respondent ($N = 131$).

Variables	Number	Percentage	
Gender			
Male	71.0	54.2	
Female	60.0	45.8	
Age group			
<40	16.0	12.2	
40–49	36.0	27.5	
50–59	33.0	25.2	
60 and above	46.0	35.1	
Education			
None	12.0	9.1	
Primary	11.0	8.4	
Secondary	17.0	13.0	
Polytechnic/College of Education/Uni.	91.0	69.5	
Occupational status			
Unemployed	6.0	4.6	
Self-employed	33.0	25.2	
Civil servant	63.0	48.1	
Retired	29.0	22.1	
Variables	Mean ± SD	Minimum	Maximum
Age (years)	53.6 ± 11.6	28.0	75.0
Weight (kg)	74.5 ± 6.3	55.0	82.0
Height (cm)	160.0 ± 6.0	150	177
BMI (kg/m^2)	29.1 ± 1.90	24.4	31.6
VAS score (cm)	6.1 ± 1.4	4.0	8.0
	Median (interquartile range)	Minimum	Maximum
RMDQ score	10.0 (1.0)	8.0	18.0

BMI: body mass index; VAS: Visual Analog Scale; RMDQ: Roland Morris Disability Questionnaire; SD: standard deviation; Uni: University.

were documented. The Yoruba FABQ was administered to these individuals after 7 days of first administration (test–retest).

Data analysis

The FABQ data was tested for normality using the Shapiro–Wilk test. The Shapiro–Wilk test chosen for normality test because it is known to perform better in most situations (skewed, symmetric short-tailed, and symmetric long-tailed distributions) than other tests of normality [27]. The Shapiro–Wilk tests suggested that the FABQ scores were not normally distributed ($p < 0.05$). Data were summarized using descriptive statistics of mean standard deviation percentages, median, and interquartile range. Cronbach's alpha was used to evaluate the internal consistency of the Yoruba FABQ. A Cronbach's alpha of at least 0.7 is acceptable for outcome measures [28]. Suitability of the data for factor analysis was first assessed using the Kaiser–Meyer–Olkin value, Bartlett's test of sphericity and correlation matrix table before principal component analysis was done. The principal component analysis with varimax rotation was used to determine the factor structure of the questionnaire. The scree plot analysis (i.e., a line plot of the eigenvalues of factors obtained during a principal factor analysis) was used to determine the number of principal components to retain. Further, Spearman rank correlation coefficient was also used to determine the discriminant validity of the Yoruba FABQ with visual analog scale scores (pain intensity) and Roland–Morris disability questionnaire scores (disability). The Bland–Altman analysis was used to provide an indication of the heteroscedasticity of the data, and 95% limits of agreement were used for describing the total error between the retest Yoruba FABQ. Intra-class correlation (single rater, absolute agreement, two-way mixed effects model) was used to determine the test–retest of Yoruba FABQ. An intra-class correlation less than 0.4 is considered to be low, while intra-class correlations between 0.4 and 0.75 and not less than 0.75 is considered to be moderate and high, respectively [29]. The minimum detectable change of the Yoruba FABQ was calculated by multiplying the standard error of the measurements, the *z*-score associated with a 95% confidence interval and the square root of 2. The standard error of measurement on the other hand was calculated by multiplying the standard deviation of all testing scores by $(1 - R)^{1/2}$ where R is the coefficient of reliability which was estimated by the intra-class correlation [30]. Ceiling and floor effects were considered to be present in the Yoruba FABQ if more than 15% of the patients scored either the highest or lowest possible scores, respectively. Data were analyzed using Statistical Package for Social Sciences version 16.0 Alpha level was set at 0.05.

Results

The mean age, weight, height, and body mass index was 53.6 ± 11.6 years, 74.8 ± 6.1 kg, 160.3 ± 6.0 cm, and 29.1 ± 1.9 kg/m^2, respectively. General characteristics of the respondents are presented in Table 1. The presence of many coefficients of 0.3 and above, Kaiser–Meyer–Olkin value of 0.79 as well as a significant result from Bartlett's test of sphericity ($X^2 = 1118.92$, $p < 0.001$) indicated that the sample size was adequate for factor analysis. Initial principal components extraction yielded a total of four factors which accounted for 69.0% of the total variance of the 16 factors. However, scree plot analysis as well as results from a parallel analysis, suggested retaining the three to four factors solution. The factors were analyzed after an orthogonal rotation was done. The first factor, with an eigenvalue of 5.7, consisted of items 6, 7, 10, 11, 12, and 13 accounting for 35.9% of the variance. The second factor, with an eigenvalue of 2.1, consisted of items 2, 3, 4, and 5 accounting for 13.4% of the variance. The third factor with an eigenvalue of 1.8 consisted of items 4, 8, 9, 15, and 16 accounting for 11.0% of the variance. Finally, the fourth factor with an eigenvalue of 1.4 consisted of item 1 accounting for 8.6% of the variance.

Table 2. Final principal axis factor analysis with Varimax-rotated factor loadings of Fear-Avoidance Beliefs Questionnaire items.

Items	Factor loading		
	Work	Beliefs related to Work	Physical activity
1. My pain was caused by physical activity			0.635
2. Physical activity makes my pain worse			0.576
3. Physical activity might harm my back			0.783
4. I should not do physical activities which (might) make my pain worse			0.873
5. I cannot do physical activities which (might) make my pain worse			0.801
6. My pain was caused by my work or by an accident at work	0.636		
7. My work aggravated my pain	0.688		
8. I have a claim for compensation for my pain	0.678		
9. My work is too heavy for me	0.643		
10. My work makes or would make my pain worse	0.565		
11. My work might harm my back	0.572		
15. I do not think that I will be back to my normal work within 3 months	0.537		
16. I do not think I will be able to ever go back to that work	0.708		
12. I should not do my regular work with my present pain		0.657	
13. I cannot do my normal work with my present pain		0.732	
14. I cannot do my normal work until my pain is treated		0.667	

A second principal components analysis with forced three factors extraction using the same rotation method yielded three factors. Factor 1 (comprising items 6, 7, 8, 9, 10, 11, 15, and 16) was characterized by the fear of pain being aggravated by work. Thus it was named "Work". Factor 2 (comprising items 12, 13, 14) was characterized by concerns of not being able to do normal work with the present pain and was named "Beliefs related to Work" while factor 3 (comprising items 1, 2, 3, 4, and 5) was characterized by the fear of pain by the fear of pain being aggravated by physical activity and was named "Physical activity". The total variance explained by the three factors was 61.6%. The final principal component analysis with Varimax rotation showing the three factors are presented in Table 2.

The Cronbach's alpha coefficient for internal consistency of the Yoruba FABQ and its subscales, work subscale, and physical activity subscale were 0.9, 0.8 and 0.8 respectively. Spearman rank correlation coefficient of the Yoruba FABQ ($r = 0.01$, $p = 0.93$) and its subscales (physical activity subscale: $r = -0.01$, $p = 0.94$; work subscale $= 0.04$, $p = 0.68$) with the visual analog scale was not significant. Further, the Yoruba FABQ ($r = 0.29$, $p = 0.001$), its physical activity subscale ($r = 0.26$, $p = 0.001$) and work subscale ($r = 0.32$, $p = 0.003$) correlated poorly with the RMDQ. Overall, the 1-week intra-class correlation of the Yoruba FABQ was 0.85 (95% CI 0.81–0.88). The intra-class correlation values were significant for all items on the Yoruba ($p < 0.001$) (Table 3). The standard error of measurement and minimum detectable change of the Yoruba FABQ was 2.5 and 7.0, respectively. The reliability indices and internal consistency of the Yoruba FABQ are presented in Table 4. Eleven patients (8.4%) in our study had test–retest values that exceeded the Yoruba FABQ minimum detectable change threshold. A Bland–Altman analysis for the test–retest of the Yoruba FABQ (Figure 1) showed that the mean differences between scores on first and second administrations were small (−1.4) and not significant. However, about eight outliers affected the 95% limits of agreements. The Yoruba FABQ had no ceiling effects as less than 15% of respondents had either the minimum ($n = 2$) or maximum possible ($n = 4$) values.

Discussion

This study translated, cross-culturally adapted, and validated the Yoruba FABQ. The new tool did not undergo any significant structural changes. However, modest culturally relevant adaptations were made. For example, words like patients were translated as "*àwọn tó ńgba ìtọ́jú*", which literally means "*persons receiving treatment*", as opposed to its direct transliteration equivalent, which is "*alaisan*" (i.e., "to sick people"). Negative connotation associated with the use of such words in the local context necessitated the adaptation. Number in the Yoruba language should literarily translate as "*óókà* (count). However, in the context of the Yoruba FABQ, the literal equivalence "'nọ́mbà" was preferred because of the modesty and ease of understanding of it. "*Nọ́mbà*" is a borrowed word often referred to as "*ọ̀rọ̀ àfétiyà*"(meaning "words translated based on their pronunciation"). The word 'compensation' in item 8 was translated to '*gbà-máà-bínú*' which literarily translates as "take and don't get angry". However, '*gbà-máà-bínú*' is accepted as an equivalent for compensation, which is not a word that is frequently used among the locals.

Generally, the Yoruba FABQ produced similar psychometric properties when compared to the original English version and other translated versions. Excellent internal consistencies were found for the Yoruba translation and its subscales. The internal consistency values obtained for the Yoruba FABQ corresponds with other FABQ versions such as the Arab (FABQ physical activity subscale $= 0.81$, FABQ work subscale $= 0.90$) [16], the German (FABQ physical activity subscale $= 0.64$, FABQ work subscale $= 0.94$) [29] and Turkish [31] versions. Various studies that have attempted to culturally adapt and validate the FABQ (Arab [16], Turkish [31], Norwegian [32] translations) have reported excellent psychometric properties which were comparable to the original version [14].

There is preponderance of the two factor-structures in most FABQ translations (Turkish [31], Norwegian [32], Swiss-German [33], Chinese [34], Persian [35], and Italian [19]). However, a three factor structure including the "work", "beliefs related to work" and "physical activity" was identified in the present study. This is similar to the three-factor structures identified in the German [29] and the Finish [36] translations. The total variance explained by these three factors (61.6%) in the present study was comparable to that of the German [29] version (64.1%). The third factor (Physical activity) was identical to the third factor of the German version [29] and the second factor of the original version [14]. The Yoruba FABQ was slightly different from the Finnish version [36] on items 5, 15, and 16. Items 15 and 16 were loaded in work in the Yoruba FABQ but loaded in beliefs related to work in the Finnish version. Further, item 5 which loaded on physical activity in the Yoruba FABQ was absent in the Finnish version as it was removed after the first factor analysis due to low loading. The items (6–11) of the first "work" subscale 1 of the Yoruba FABQ denotes the general and widely accepted belief that LBP may be as a

Table 3. Cronbach's alpha if items of the Yoruba Fear Avoidance Beliefs Questionnaire is deleted and item by item correlation between the test–retest of the Yoruba Fear Avoidance Beliefs Questionnaire ($N = 131$).

Item	Cronbach's alpha if item deleted	Intra-class correlation	95% confidence interval	
			Lower bound	Upper bound
1	0.87	0.94	0.92	0.96
2	0.85	0.95	0.94	0.97
3	0.86	0.92	0.89	0.95
4	0.87	0.9	0.83	0.93
5	0.86	0.9	0.86	0.93
6	0.86	0.91	0.88	0.94
7	0.85	0.94	0.91	0.95
8	0.86	0.95	0.92	0.96
9	0.85	0.88	0.83	0.92
10	0.85	0.93	0.9	0.95
11	0.85	0.91	0.87	0.92
12	0.85	0.94	0.91	0.96
13	0.86	0.91	0.88	0.94
14	0.87	0.97	0.96	0.99
15	0.86	0.95	0.93	0.97
16	0.86	0.95	0.93	0.97

Table 4. Reliability indices and internal consistency of the Yoruba Fear Avoidance Beliefs Questionnaire.

	Yoruba FABQ	Work subscale of the Yoruba FABQ	Physical activity subscale of the Yoruba FABQ
Test, median (25th, 75th percentiles)	37.0 (27.0, 45.0)	15.0 (12.0, 19.9)	22.0 (13.0, 27.0)
Retest, median (25th, 75th percentiles)	37.0 (27.0, 47.0)	21.0 (12.0, 19.0)	16.0 (13.0, 27.0)
Median difference (25th, 75th percentiles)	1.0 (−1.0, 4.0)	7.0 (0.0, 11.0)	−7.0 (−11.0, 0.0)
ICC (95% CI)	0.97 (0.95, 0.98)	0.93 (90.91, 0.95)	0.91 (0.88, 0.94)
Standard error of measurement	2.5	1.8	2.6
Minimal detectable change	7.0	5.0	7.2
Cronbach's alpha	0.90	0.8	0.8

FABQ: Fear Avoidance Beliefs Questionnaire; ICC: intra-class correlation.

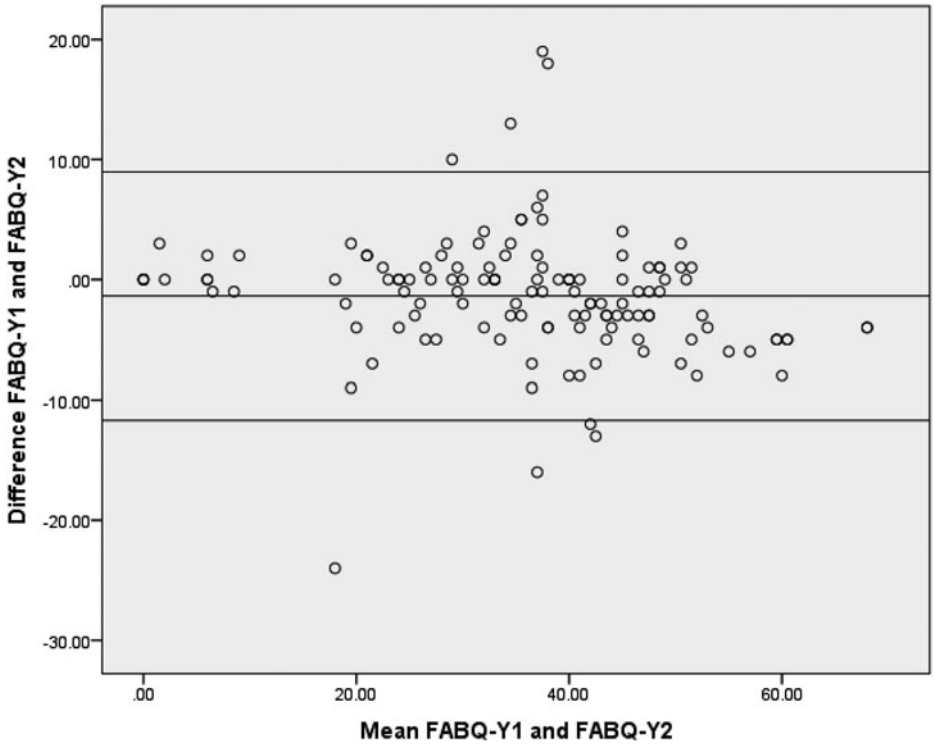

Figure 1. Bland–Altman plot for fear-avoidance beliefs as assessed by a 7-day interval test–retest of the Yoruba fear avoidance beliefs questionnaire. Mean difference: −1.35 ± 2 SD.

consequence of working conditions, while the remaining items 15 and 16 views the possibility of return to work. The influence of this subscale in perpetuating fear avoidance behavior may however be slight. On the other hand, we postulate that the work subscale 2, describing beliefs related to being able to work with the present pain, may significantly help in identifying individuals with maladaptive beliefs and thus strongly influence behavior change. The two work subscales (work and beliefs related to work) found in our study are comparable to other FABQ translations (German [26], Italian [19], and Finnish [36]). Thus, it is

suggested that holistic reevaluation of the FABQ be done as there seems to be evidence for three factor structure for the FABQ.

The reliability of the test–retest fell within excellent reliability band of 0.88–0.97 using the intra-class correlation. The reliability results of the Yoruba FABQ are comparable to those of other translated versions: Persian (0.81) [35], Chinese (0.85) [34], and Brazilian-Portuguese (0.98) [37]. Variations in the intra-class correlation obtained for the reliability tests of the different FABQ translations can be attributed to the different times at which the retests of the translations were conducted. The shorter the retest period is, the higher the likelihood for respondents to remember or be influenced by their first set of responses. Further, the longer the retest period is, there is the possibility that genuine differences might have occurred. In the present study, the 7-day interval test–retest reliability of the Yoruba FABQ consistently demonstrated better results for the work subscale than for the physical activity subscale. These results are analogous to the results of other studies [14,18,22]. Further, the minimal detectable change of the Yoruba FABQ-Y was satisfactory. Minimal detectable change can be used as a threshold to identify significant change in an individual patient. The proportion of persons that exceeds the minimal detectable change represents individuals who have had significant changes between two successive measurements [38]. For instance, in our study with a minimal detectable change of 7 for the Yoruba FABQ, only 8% of the persons with LBP showed an improvement of more than 7 points.

The Yoruba FABQ and its subscales showed little or no relationship with either of the Roland–Morris disability questionnaire and visual analog scale scores. This result is similar to reports of previous translations of the FABQ [19,22,32,35]. For instance, Ibrahim et al. [22] reported that the Hausa version of the FABQ had weak correlations with the visual analog scale and the Roland–Morris disability questionnaire. This result is anticipated since the FABQ assesses dissimilar conceptual constructs as visual analog scale and Roland Morris disability questionnaire. The unavailability of a gold standard measure for the FABQ makes the assessment of its criterion validity evasive [22,34]. However, non-correlation between the visual analog scale, Roland Morris disability questionnaire and the Yoruba FABQ, indicating that the latter questionnaire measures different constructs from the previous two, provide evidence for the discriminant validity of the measure. As the Yoruba FABQ had no ceiling or floor effects, it can be reasonably deduced that it can be used to successfully assess the full range of fear avoidance beliefs related to chronic LBP. This result is in tandem with those obtained in previous studies of Spanish [17], Brazillian-Portuguese [37], and Chinese [34] translations.

The results of this study indicate that the FABQ is a reliable and valid instrument for the measurement of fear-avoidance beliefs among Yoruba speaking patients with LBP. It is also comprehensible and fast to fill out, making it suitable for use in routine healthcare. Comprehensibility, reliability, and discriminant validity of the Yoruba FABQ are similar to those of the original British version [14]. The high rate of data completion, good quality data and also a response rate of 81% obtained upon the administration of the Yoruba FABQ suggests its acceptability as a LBP outcome measure in the Yoruba-speaking population. The Yoruba FABQ is adequate and maybe an appropriate outcome measurement tool for clinical use in patients with LBP among the Yoruba-speaking population.

This study is however not without limitations. First, a Rasch analysis was not done for the Yoruba FABQ. Rasch analysis helps to address issues relating to the fitting of single items, ordering of the response categories and converting the ordinal raw score of the FABQ to a linear model [39,40]. Using the Rasch analysis, a previous study however showed that the total item score as well as the subscale scores of the FABQ (Italian version) did not satisfy the criteria for it to be regarded as a unilateral construct in patients with chronic LBP [41]. Rather, the authors suggested that the FABQ be viewed as a multiple psychological constructs-describing scale and that the raw score of the FABQ and changes in scores must be interpreted with caution [41]. Another limitation of this study was the dependence on self-report measures only and the absence of objective clinical or performance tests results. This is because self-report can be influenced by placebo effects and outcome expectations. Translation and cultural validation of other LBP psychosocial outcome measures in the Yoruba language are also warranted to make these instruments available for the Yoruba speaking patient.

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Disclosure statement

The authors report no declarations of interest.

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