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Mbada, CE, Adeulure, TG, Idowu, OA, Oyewole, OO, Odole, AC, Afolabi, TO, Afolabi, AD, Johnson, OE, Akindele-Agbeja, OB and Fatoye, F (2021) Translation and psychometric evaluation of the Yoruba version of the STarT Back tool among persons with longterm non-specific low-back pain. Annali di igiene : medicina preventiva e di comunita, 33 (5). pp. 443-455. ISSN 1120-9135

DOI: https://doi.org/10.7416/ai.2021.2448

Publisher: Societa Editrice Universo

Version: Published Version

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Ann Ig 2021 Sep-Oct; 33(5): 443-455. doi: 10.7416/ai.2021.2448

Translation and psychometric evaluation of the Yoruba version of the STarT Back tool among persons with long-term non-specific low-back pain

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Key words: STarT Back Tool, Low Back Pain, Yoruba Language
Parole chiave: Strumento STarRT Back, dolore lombare, linfguaggio Yoruba

Abstract

Background. *Translating questionnaires into local languages is essential as it aids easy accessibility and understanding of such questionnaires by patients and their health caregivers. The STarT Back Tool (SBT), validated tool used to classify subgroups of persons with Low-Back Pain, has few translated versions. We translated the STarT Back Tool into the Yoruba language and established its psychometric properties among patients with long-term non-specific Low-Back Pain.*

Methods. *Following the Lenz protocol, the SBT was successfully cross-culturally adapted into the Yoruba language. One hundred consenting patients (mean age = 57.0±11.43 years, 55% females) took part in the validation phase, while 53 of them participated in the test-retest phase. Psychometric indices of the Y-SBT assessed showed internal consistency, intraclass correlation coefficient (ICC), ceiling and floor effects and divergent validity.*

Results. *The sub- and total Cronbach's α score for Y-SBT was 0.704 and 0.857, respectively. The test-retest reliability of the sub- and total scores of the Y-SBT yielded an ICC of 0.82 (95% CI: 0.74 - 0.87) and 0.89 (95% CI: 0.84 - 0.93), respectively. The divergent validity for sub- and total-scores of the Y-SBT based on Quadruple Visual Analogue Scale score for on-going pain was r = 0.374 (p = 0.001) and r = 0.432 (p = 0.001), respectively. The Y-SBT had no ceiling or floor effects.*

Conclusion. *The Y-SBT have acceptable psychometric properties. It is recommended for use among Yoruba speaking patients with LBP.*

Introduction

Low-back pain (LBP) is a global health burden which results in more global disability than any other health condition (1). Most people will experience LBP at one or more points during their lifetime (2). As ageing population increases, the encumbrance associated with LBP will increase (3). Patients' response to LBP treatments

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Annali di Igiene : Medicina Preventiva e di Comunità (Ann Ig)
ISSN 1120-9135 https://www.annali-igiene.it
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becomes unpredictable, with a significant rate of LBP recurrence (4). For example, while only 6-17% of cases of acute LBP develop into chronic LBP (2, 5, 6), recurrence of LBP in the following 12 months is reported to range between 25% and 80% (4). Most LBP cases are self-limiting and resolve within a few weeks (7). Chronic LBP, which interfaces with both psychological and physical deconditioning manifests through a myriad of impairments (8, 9). Evidence-based primary care guidelines for non-specific LBP emphasized the need to identify factors suggestive of poor prognosis to aid appropriate and focussed treatment (10,11). Several authors have established that proper recognition of prognostic indicators gives rise to effective early prevention strategies for LBP in primary care (12, 13). Hence, determining patient subgroups who are at risk of persistent pain and disability is a high research priority (14, 15).

Translating patient reported outcome measures into local languages is necessary as it aids easy accessibility and understanding of such outcome measures/questionnaires by the patient and their health caregivers. Thus, the original English version of the "Subgroups for Targeted Treatment Back Tool" (16) (see below) has been translated into other languages such as Italian, French, Spanish, German, isiZulu and Persian (17-22). However, there is no validated translation of such tool into Yoruba language, an indigenous Nigerian language. Although English is the official language in Nigeria, a considerable number of patients in Nigeria do not communicate in English. This inability to communicate in the English language is associated with the nation's vast diversity in ethnic groups and languages (23). The Yoruba language is spoken in Nigeria, representing about 21% of the total Nigerian population of 180 million. The Yoruba language is likewise spoken in other parts of the African continent such as Togo, the Republic of Benin, Ghana, and Ivory-Coast, making the Yoruba ethnic group one of the largest ethnic groups in Africa, with over 45 million people (24). Despite the large population of native Yorubas, only a simple, informal adaptation of the Tool into the Yoruba language exists (25); hence the need for a Yoruba translated, reliable and validated version of the Tool. Thus, this study aimed to cross-culturally adapt and validate the Yoruba version of the Tool.

Methods

Instruments

English version of the "Subgroups for Targeted Treatment Back Tool"

The Subgroups for Targeted Treatment (STarT) Back Tool (SBT) is a validated brief screening tool designed to identify subgroups of patients, to stratify LBP patients based on prognosis, and to guide initial decision making on early secondary prevention of LBP in primary care (16). The SBT identifies treatment-modifiable prognostic physical and psychological indicators for persistent, debilitating symptoms using nine questions. The SBT has equivalent excellent psychometric properties as the Orebro Musculoskeletal Pain Screening Questionnaire, a popular, validated tool, besides being simpler and shorter (26, 27). The total score of the SBT is computed by summing up questions one to nine, while the sub-score (psychosocial scale) is calculated by adding scores from questions five to nine. Agreement to statement of question of an item is scored 'one', while a disagreement to the statement of question is scored 'zero'. The original SBT developed in the United Kingdom has over twenty-three translated language forms, with fifteen reporting the psychometric properties of some of the translations (28).

Quadruple Visual Analogue Scale (QVAS)

QVAS is a pain assessment tool that measure pain intensity at four level: "current

pain level", "average pain", "pain level at mildest" and "worst pain". Each level of measurement consist of a line 10 cm long with ends marked with extreme states [zero (no pain) to 10 (worst pain)]. It showed high reliability with r of 0.60-0.77 (29).

Phase 1- Translation

The original developers of the SBT permitted the authors to translate the SBT into the Yoruba language. The translation process of the SBT into the Yoruba language was based on established protocols for instrument translation (30). The translation procedure adopted a five-step process.

Step 1: Initial translations - Forward translation of the items and response options of the SBT into the Yoruba language by two native Yoruba speakers (a physiotherapist and a Yoruba linguist) who were proficient in the English language was carried out. Hence, two separate forward translations (T1 and T2) were produced.

Step 2: Synthesis - A synthesised Yoruba version (T3) was produced by two bilingual (Yoruba and English) translators who did not take part in the forward translation. Clarity rating, difficulty, conceptual equivalence, and common language usage of the synthesized translation (T3) of the synthesized version was assessed by two native Yoruba speakers. Clarity rating was based on a scale of 0 to 100 (with 0 meaning "extremely poor", and 100 "perfect"). Likewise, difficulty was evaluated using a scale of 0 to 100 (where 0 meant "not difficult at all" and 100 meant "extremely difficult"). Both difficulty and clarity were rated 80 by the first assessor, while the 2nd assessor rated them as 90 and 80, respectively.

Step 3: Back translation - The synthesised version (T3) was back-translated into English by a professional bilingual (Yoruba and English) translator to identify discrepancies in the words and concepts of the synthesized version. This back-translation was referred to as BT1.

Step 4: Expert panel review - An expert panel comprising four translators, and two physiotherapists met to discuss issues of cultural adaptations and linguistic equivalence with the original English version of the SBT. The outcome of this stage (BT2) was used as the pre-final version of the Yoruba SBT translation.

Step 5: Pilot testing - To check for comprehension and acceptability, the BT2 was administered to 20 native Yoruba speaking patients with non-specific LBP. Eligibility criteria included being able to read and write in Yoruba language, having no cognitive impairment and being above the age of 30 years. A cognitive debriefing was done individually; observations on comprehension and hesitations were made, participant's interpretation of items was investigated to evaluate whether the pre-final version retained equivalence to the items of the English version. Reports were prepared at each stage to cover the issues encountered and how they were resolved. After the interview process, the findings were discussed, and the final version was produced (Y-SBT, see appendix).

Phase 2 - Psychometric evaluation

The psychometric evaluation phase of this study involved 100 (45% males and 55% females) consenting patients with long-term non-specific LBP who volunteered, to take part in the validation phase and 53 patients for reliability testing phase of the Y-SBT. A sample size of a minimum of 50 patients was suggested as sufficient for validation studies (31). The patients in this study were those that have received treatment from five selected outpatient departments of physiotherapy and orthopaedic units of hospitals in south-western Nigeria, and who met the following inclusion criteria: must be literate in Yoruba languages, having pain duration ≥3 months, having no cognitive impairment and being above the age of 30 years. While patients with LBP, who had previous acute

trauma to the spine, previous spinal surgical interventions, and those who were pregnant, had tumours, osteoporosis, and cauda equina syndrome were excluded.

The Y-SBT was administered to the participants to fill. No assistance was given to participants in answering the questions of the tool. The Y-SBT was correlated against pain intensity of the participants to establish its divergent validity. We speculated that Y-SBT scores will be positively correlated with pain intensity. Pain intensity was assessed using the Quadruple Visual Analogue Scale (QVAS). Besides, age, sex, height, weight and BMI were also obtained. The Y-SBT was re-administered for a retest seven days after the initial administration. The study was approved by the Health Research and Ethics Committee of the Obafemi Awolowo University Teaching Hospital Complex, Ile-Ife, Nigeria.

Data analysis

Data were analysed using descriptive statistics of mean, standard deviation and percentages. Inferential statistics of Cronbach - α was used to test internal consistency while two-way random, average measures, absolute agreement intraclass correlation coefficient (ICC) was used to assess test-retest reliability of Y-SBT. Divergent validity of Y-SBT with QVAS was assessed using Spearmans rank correlation. Confirmatory factor analysis was also performed to confirm two subscales of the Y-SBT and Maximum Likelihood was used for parameter estimation. ICC and $\alpha \geq 0.70$ was considered as good test-retest reliability and internal consistency (31). To evaluate the fitness of the model, fit indices: "standardized" factor loadings, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and the Root Mean Square Error of Approximation (RMSEA) were applied. For the RMSEA, a value of ≤ 0.05 was interpreted as close fit, while values of ≤ 0.08 were interpreted as acceptable fit and for both TLI and CFI, a cut-off value of ≥ 0.95 was applied (32). Data were analysed using Statistical Package for Social Sciences (SPSS) Version 23.0 and AMOS Version 23.0 with the alpha level set at 0.05.

Results

The participants in this study were 45 males and 55 females. The mean age, weight, height and BMI of the respondents was 57.0±11.43 years, 69.5±9.33 Kg, 1.64±0.07 metres and 29.57±3.72 Kg/m^2, respectively. The internal consistency (Cronbach's α) for sub- and total scores of the Y-SBT were 0.704 and 0.857, which were greater than 0.70 (Table 1). The two subscales were confirmed with factors loading ranging from 0.13 to 0.72. The two-factor model was satisfactory, having fulfilled all necessary requirements after model modification. The model modifications include two correlation residuals and a cross-loading (Figure 1). The model fit values of RMSEA, TLI and CFI were 0.06, 0.92 and 0.95, respectively.

Table 1 - The Reliability of Yoruba version of the STarT Back Tool (n=53)

	Cronbach's α	ICC	95%CI of ICC
Sub-score	0.704	0.817	0.739 - 0.873
Total Score	0.857	0.892	0.844 - 0.926
Cronbach's alpha of the Y-SBT if one item is deleted			
Y-SBT items			
1	0.655		
2	0.757		
3	0.615		
4	0.597		
5	0.582		
6	0.648		
7	0.678		
8	0.621		
9	0.631		

CI = Confidece interval; ICC = intraclass correlation coefficient

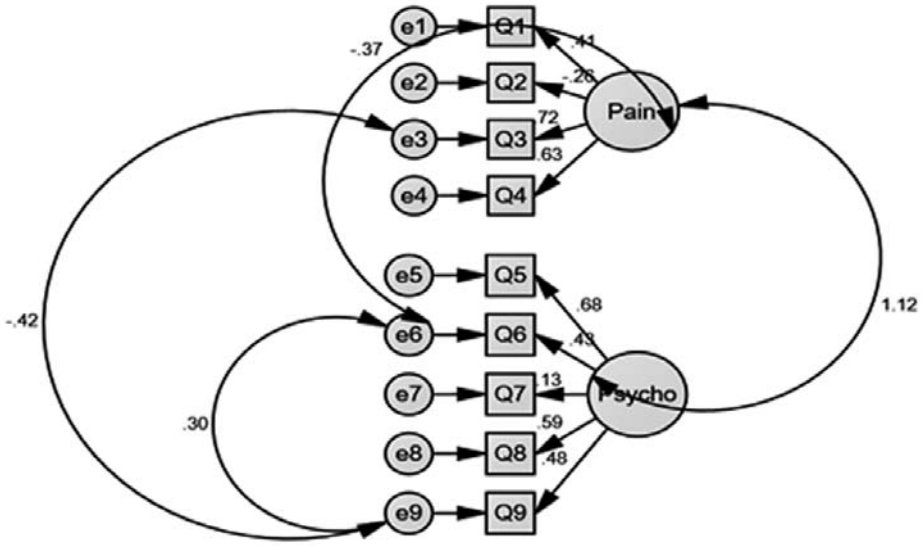

Figure 1 - Two-factor model of Y-SBT.
Chi-square = 32.2; df = 23; P = 0.097; RMSEA = 0.95; CFI = 0.06; TLI = 0.92

The divergent validity of the Y-SBT using pain intensity is presented in Table 2. It shows a correlation coefficient (r) that ranges from 0.241 to 0.432 for the total score and 0.249 to 0.374 for sub-score, respectively. None of the patients achieved either the maximum or the minimum possible scores of Y-SBT, suggesting absence of floor or ceiling effects.

Table 2 - Divergent validity of the Yoruba version of the STarT Back Tool with pain intensity (n=100)

	Total SBT score		Sub-SBT score	
	r	p-value	r	p-value
Current Pain	0.432	0.001	0.374	0.001
Average Pain	0.241	0.016	0.283	0.004
Least Pain	0.306	0.002	0.303	0.002
Worst Pain	0.266	0.008	0.249	0.013

Discussion and Conclusions

To the best of our knowledge no previous study has translated and evaluated the psychometric properties of Y-SBT. With the written permission of the original developers of the SBT at Keele University, United Kingdom, we translated and evaluated the psychometric properties of the Y-SBT among adult patients with long-term non-specific LBP. From this study, the Y-SBT has acceptable validity, and the values obtained are comparable with those reported for the original SBT validation study. Sub- and Total Cronbach's α scores for Y-SBT were 0.704 and 0.857, while the original SBT has a Cronbach's α of 0.74 and 0.79, respectively (16). Furthermore, the scores obtained in this study is comparable with values obtained in other translations such as the Iranian (total score 0.82; subscale: 0.79) (33) and French (Subscore: 0.74) versions (18). From this study, the internal consistency and the item

redundancy for the subscale and total score were high, even as poor internal consistency was defined as $\alpha < 0.70$, and item redundancy was defined as $\alpha > 0.90$ (34). Results of item-by-item reliability in other studies vary markedly. For example, the French version had Kappa = 0.67/0.68 on test-retest reliability (27).

The divergent validity for the sub- and total scores of the Y-SBT based on pain intensity range from poor to moderate (ranging from 0.266 to 0.432 for the total score and 0.249 to 0.374 for sub-score). It is noteworthy to state that the different studies utilized different tools for external validation. Similar to this study, the Japanese version has a divergent validity of 0.30 to 0.59 using pain intensity (35), while the French SBT shows a correlation coefficient of 0.66 (18). However, comparing the external validation result of the Y-SBT with other translations is hamstrung by methodological variations concerning the choice of comparator tool. For example, the German version made use of the Roland Morris Disability Questionnaire (20, 36) while the Swedish version used Örebro Musculoskeletal Pain Screening Questionnaire (37). Furthermore, Y-SBT had no floor or ceiling effects, as none of the patients achieved either the maximum or the minimum possible scores. Floor and ceiling effect occurs when the respondents that attain the lowest or highest possible score are greater than 15%. Terwee et al (31) surmised that floor or ceiling effects in outcome measures make them typically incapable of detecting extreme scores in their upper or lower ends, thereby compromising the reliability of the scale. Therefore, this suggests uncompromising reliability of Y-SBT tool.

Availability and use of Y-SBT may lead to great impact on public health in Nigeria through guiding initial decision making on early secondary prevention of LBP in primary care among Yoruba-speaking populations. The tool, a prognostic tool categorising patients to low, mediun or high risk disabling LBP, will aid in stratified care for low back pain. Previous study has shown that stratified care in which prognostic screening is combined with matched treatment was effective and resulted in improved patient outcomes, reductions in LBP-related work absence and lower healthcare costs compared to current best practice (38).

This study have some limitations which must be considered while interpreting the results. The data represent only long-term non-specific LBP participants. Psychosocial influence of pain may vary from acute, sub-acute and chronic phase of LBP. Since the Y-SBT included psychosocial domain, the results may not be generalised for acute and sub-acute non-specific LBP. Validating the Y-SBT for prognosing pain and disability should be ideal but we only validated for prognosing pain. Another limitation of this study is some of the participants that participated in test-retest phase received treatment during a week interval between the retest. This may influence the clinical stability which is necessary for test-retest reliability. Despite these limitations, this is the first study in Nigeria to provide cultural translation and evaluated psychometric properties of Y-SBT. This preliminary results can be useful for prognosing pain by the rehabilitation professionals.

In conclusion, the Yoruba version of the SBT has acceptable validity and reliability, and it may be a useful tool for research and clinical purposes among Yoruba speaking patients with low-back pain, and may help improve access to physiotherapy interventions for these patients, thereby improving their health outcomes.

The Keele STarT Back Screening Tool

Patient name: _____ Date: _____

Thinking about the **last 2 weeks** tick your response to the following questions:

		Disagree 0	**Agree** 1
1	My back pain has **spread down my leg(s)** at some time in the last 2 weeks	☐	☐
2	I have had pain in the **shoulder** or **neck** at some time in the last 2 weeks	☐	☐
3	I have only **walked short distances** because of my back pain	☐	☐
4	In the last 2 weeks, I have **dressed more slowly** than usual because of back pain	☐	☐
5	It's not really safe for a person with a condition like mine to be physically active	☐	☐
6	**Worrying thoughts** have been going through my mind a lot of the time	☐	☐
7	I feel that **my back pain is terrible** and **it's never going to get any better**	☐	☐
8	In general I have **not enjoyed** all the things I used to enjoy	☐	☐

9. Overall, how **bothersome** has your back pain been in the **last 2 weeks**?

Not at all	Slightly	Moderately	Very much	Extremely
☐ 0	☐ 0	☐ 0	☐ 1	☐ 1

Total score (all 9): _____ Sub Score (Q5-9):_____

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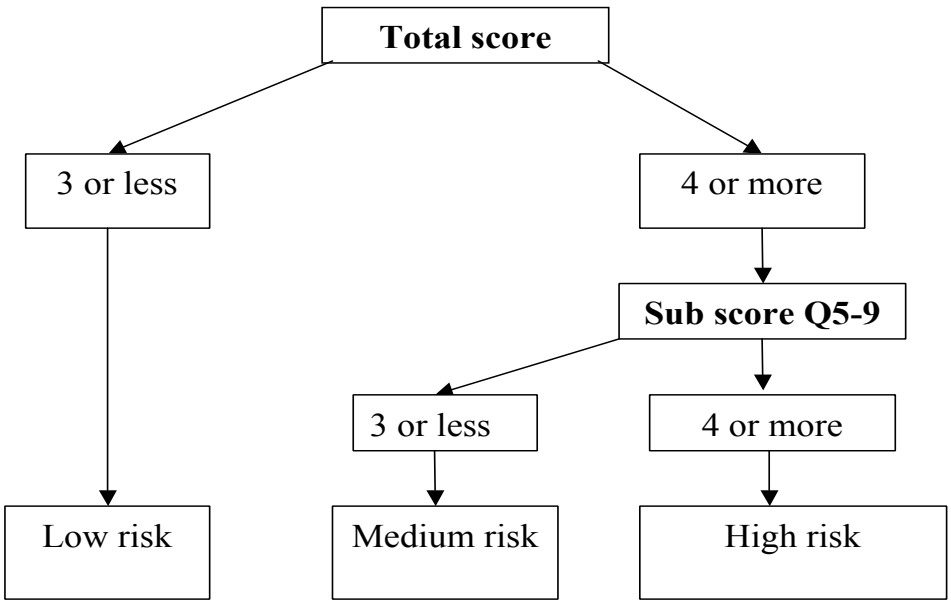
The STarT Back Tool Scoring System



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IRIN-IṢẸ́ FÚN ÌBẸ̀RẸ̀ ÀYẸ̀WÒ ẸỌ̀YÌN TI KEELE (Yoruba version of the STarT Back tool)

Orúkọ Olùgbàtójú _____ Déétí _____

Ríronú nípa ọ̀sẹ̀ méjì tí ó kọjá sẹ́yìn, fa ìlà sí ìdáhùn rẹ̀ lórí àwọn ìbéèrè wọ̀nyí:

		Mo gbà	N kò gbà
1	Ẹ̀yìn dídùn mi ti **ràn dé ẹsẹ̀ mi** ní ìgbà kan rí láàrin ọ̀sẹ̀ méjì tó kọjá	☐	☐
2	Mo ti ní ìrora níbi **èjìka tàbí ọrùn** ní ìgbà kan rí láàrin ọ̀sẹ̀ méjì tó kọjá	☐	☐
3	Àwọn **ibi tí kò jìnnà** ni mo rìn lọ nítorí ẹ̀yìn tó ń dùn mí	☐	☐
4	Láti bí ọ̀sẹ̀ méjì sẹ́yìn, ìmúra mi lọ́ra sí i, nítorí ẹ̀yìn dídùn, léyìí ti kì í ri bẹ́ẹ̀ tẹ́lẹ̀	☐	☐
5	O léwu fún irúfẹ́ ẹni tí ó bá wà ní irú ipò tí mo wà yìí láti máa ṣiṣẹ́ pẹ̀lú àgó ara	☐	☐
6	**Ìrònú** ti n dọkàn láàmú, ti n gba ọkàn mi ní ọ̀pọ̀lọpọ̀ ìgbà	☐	☐
7	Mò n mọ̀ lára pé ẹ̀yìn dídùn mi burú jáì, **kò sì lé padà bọ́ sípò mọ́**	☐	☐
8	Lápapọ̀, n **kò jẹ ìgbádùn** àwọn nǹkan tí mo ti máa ń jẹ̀gbádùn tẹ́lẹ̀	☐	☐

9. Olúborí gbogbo rẹ̀, báwo ni ẹ̀yìn dídùn rẹ ṣe ń **kọ ọ́ lóminú** tó **láàrìn ọ̀sẹ̀ méjì** tó kọjá?

rárá	ṣẹ́pẹ́rẹ́	Níwọ̀ntunwọ̀nsí	Gidigan	Burú jáì
☐	☐	☐	☐	☐

Àropọ̀ iye tó jẹ (méṣàn-án) _____ Àropọ̀ ẹ̀ka iye (5-9) _____

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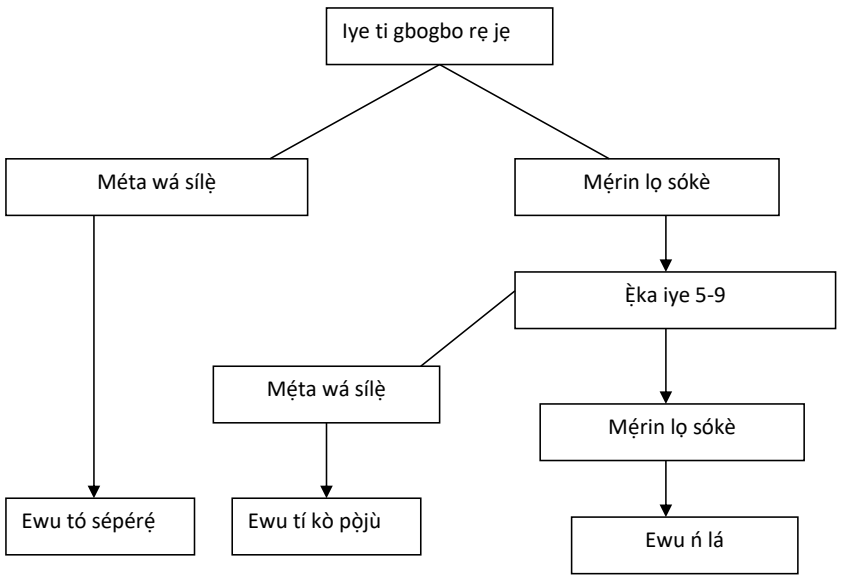
Ọ̀nà Isirò Iye Gbèdéke Ẹ̀yìn



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Funded by Arthritus Research U.K.

Acknowledgements

Funding: None
Competing interests: None declared
Authorization to translate the STarT Back Tool intoYoruba languge and to employ it for research purposes: granted by Prof Jonathan Hill (<j.hill@keele.ac.uk>) via an email on Feb 22 2017 to the Authors.
Ethical approval: Approval was obtained from the Health Research and Ethics Committee of the Obafemi Awolowo University Teaching Hospital Complex, Ile-Ife, Nigeria. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.
Competing interests: The authors declare no conflict of interest
Authors contribution: Conceptually and design - Mbada, Fatoye, Odole, Oyewole; Acquisition of data - Adeulure, Afolabi T, Afolabi A, Akindele-Agbeja; Analysis and interpretation - Mbada, Idowu; Drafting - Mbada, Idowu, Afolabi, Afolabi, Oyewole, Akindele-Agbeja; Revision - All authors; Approval - All authors

Riassunto

Translazione e valutazione psicometrica della versione in lingua Yoruba dello strumento STarT Back nelle persone con dolore lombare cronico aspecifico

Premessa. La traduzione dei questionari nei linguaggi locali è essenziale in quanto rende agevole ai pazienti ed al personale sanitario capirli ed utilizzarli. Lo strumento STarT Back, validato per classificare i sottogruppi di soggetti affetti da dolore lombare, è già stato tradotto in più lingue. Noi lo abbiamo tradotto in lingua Yoruba e definito le sue proprietà psicometriche nei pazienti con dolore lombare e cronico non specifico.

Metodi. Sulla base del protocollo di Lenz, lo strumento STarT Back è stato transculturamente adattato con successo al linguaggio Yoruba. Cento pazienti che avevano firmato il consenso informato (età media = 57.0±11.43 anni, al 55% di sesso femminile) hanno partecipato alla fase di validazione, mentree 53 di essi hanno partecipato alla fase test-retest. Gli indici psicometrici dello strumento StarT Back versione Yoruba misurati hanno dimostrato coerenza intrinseca, un coefficiente di correlazione interclasse, effetti ceiling e floor e validità divergente.

Risultati. I punteggi subtotale e totale di Cronbach α per lo strumento STarT Back in versione Yoruba hanno dato un ICC, rispettivamente, di 0,82 (95% CI: 0,74 – 0,87) e 0,89 (95% CI: 0,84 – 0,93). La validità divergente per i punteggi subtotale e totale dello strumento STarT Back in versione Yoruba, basati sulla scala Casuale Analogica Quadrupla per il dolore in corso, ha dato il risultato di r = 0,374 (p = 0,001) e r = 0,432 (p = 0,001), rispettivamente. Lo strumento STarT Back versione Yoruba non ha mostrato nè effetto ceiling nè effetto floor.

Conclusioni. Lo strumento STarT Back versione Yoruba possiede accettabili proprietà psicometriche, e ne è raccomandato l'uso per i pazienti di lingua Yoruba con dolore lombare.

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