Original Article

Translation and Psychometric Evaluation of the Yoruba version of Quadruple Visual Analogue Scale

Mbada CE[1], Akindele FF[1], Fatoye CT[2], Ademoyegun AB[3], Odole AC[4], Ogunlana MO[5], Idowu AO[6], Adegbemigun OD[7], Fatoye F[2]

[1]Department of Medical Rehabilitation, College of Health Sciences, Obafemi Awolowo University, Ile-Ife, [3]Department of Physiotherapy, Ladoke Akintola University of Technology Teaching Hospital, Osogbo, [4]Department of Physiotherapy, College of Medicine, University of Ibadan, Ibadan, [5]Department of Physiotherapy, Federal Medical Centre, Abeokuta, [6]Department of Physiotherapy, Federal Medical Centre, Ido-Ekiti, [7]Department of Physiotherapy, Faculty of Allied Health Sciences, University of Medical Sciences, Ondo, Nigeria, [2]Department of Health Professions, Faculty of Health, Psychology and Social Care, Manchester Metropolitan University, Manchester, England, United Kingdom

ABSTRACT

Context: Wide application of the Quadruple Visual Analogue Scale (QVAS) is hamstrung by dearth or lack of its translations into other languages.
Aims: This study was aimed to translate and determine the psychometric properties of the Yoruba version of the QVAS (QVAS-Y).
Materials and Methods: The translation process involved forward-translation, synthesis, back-translation, expert review and pre-final testing. The English QVAS and QVAS-Y were administered to 100 consenting patients with chronic low back pain to determine the validity of the new translation, while 51 of the respondents completed the QVAS-Y again after 7 days for test–retest reliability. The Oswestry Disability Index was used to test its external validity. Data were analysed using descriptive and inferential statistics. Alpha level was set at $P < 0.05$.
Results: The concurrent validity score for QVAS-Y was $r = 0.896$, $P = 0.001$, and ranges between 0.465 (lowest) and 0.856 (highest) for items 4 and 1, respectively. The QVAS-Y has moderate external validity ($r = 0.341$; $P = 0.001$) and its reliability value was 0.622 and ranges between 0.465 and 0.668 per item. The Cronbach's alpha for the QVAS-Y was 0.767 and ranges between 0.635 and 0.801 per item.
Conclusion: The concurrent validity, reliability and internal consistency of the QVAS-Y are adequate to assess pain among Yoruba population.

Key words: Low back pain, psychometric properties, Quadruple Visual Analogue Scale, Quadruple Visual Analogue Scale-Yoruba, translation

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INTRODUCTION

Patients' self-reporting of pain provides the most valid measurement of pain.[1] The range of pain measurement tools is vast, and falls into unidimensional and multidimensional scales. Single-dimensional scales assess a single dimension of pain and pain intensity especially when the aetiology is clear. Multidimensional scales measure the intensity, nature and location of the pain.[2]

The Quadruple Visual Analogue Scale (QVAS), as a unidimensional pain assessment tool, consists of four scales: 1 – pain level at the time of the current office visit; 2 – usual or average pain since the last visit; 3 – peak or maximum pain level since the last visit, time of intake or since the onset of the condition; 4 – pain level at best.[3] Currently, the QVAS has limited translated versions.

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The QVAS is bound to be affected by cultural sensitivity which may limit its applicability in populations other than the English-speaking population. This is because cultural groups are reported to vary in pain expression and in their use of various healthcare systems.[4] The Afrikaans translated version of QVAS established its high reliability and validity compared to its English version.[5] Translation of tools in local languages is believed to allow for easy accessibility and understanding of the questionnaire by patients and will also bring about its effective use among researchers and in clinical settings.

Consequent to the foregoing, this study was aimed at translating the QVAS into Yoruba language. Yoruba is one of the three major languages spoken by Nigerians.[6] Yoruba

Address for correspondence: Dr. Mbada CE, Department of Medical Rehabilitation, College of Health Sciences, Obafemi Awolowo University, Ile-Ife, Nigeria.
E-Mail: doziembada@yahoo.com

is spoken by about 22 million people in Southwest Nigeria, Republic of Benin, Togo, the UK, Brazil and the USA.[7] Availability of a translated, reliable and validated Yoruba version of the QVAS (QVAS-Y) may increase its utilisation among the Yoruba population.

MATERIALS AND METHODS

Participants

This study got approval from the Health Research and Ethics Committee of the Obafemi Awolowo Teaching Hospital Complex, Ile-Ife, Nigeria. The study was conducted at the physiotherapy departments of three selected hospitals (Obafemi Awolowo University [OAU] Teaching Hospital, Ile-Ife; University College Hospital, Ibadan; and Wesley Guild Hospital, Ilesha) in the south-west zone of Nigeria. A total of 100 patients (36 males and 64 females) with non-specific low back pain (LBP) consented to participate in the study.

Inclusion criteria for this study included having non-specific LBP of not <3 months, being 35 years and older, being literate in both English and Yoruba languages and having no cognitive or mental impairment. Excluded from the study were patients with psychological disorder and those having visual impairment, systemic illness (a tumour or rheumatologic diseases) or other comorbidity.

Instrument

The tools used in this study were:

i. The English version of QVAS

The QVAS assesses pain intensity. The scale measures pain intensity at four levels: 'pain right now', 'average pain', 'best pain' and 'worst pain'. It consists of four visual analogue scales. Each scale consists of a 10-cm long horizontal line, the ends of which are marked with the extreme states of the items being measured. The ratings will be averaged and then multiplied by 10 to yield a score from 0 to 100.[3] The final score will then be categorised as 'low intensity' (pain <50) or 'high intensity' (pain >50).

ii. The translated QVAS-Y [Appendix 1]
iii. Oswestry Disability Index (ODI).

The ODI represents a ten 6-point questionnaire: the first section rates the intensity of the pain and the remaining ones cover the disabling effect of pain on typical daily activities: personal care, lifting, walking, sitting, standing, sleeping, sexual life and travelling. Each item ranges from 0 to 5 and the sum of the ten scores is expressed as percentage of the maximum scores, varying from 0 (no disability) to 100 (maximum disability).[8]

Weight, height and body mass index (BMI) were also obtained from the participants.

Procedure

The purpose and procedures of the research work were explained to each of the participants and their informed consent was obtained. The English version of QVAS was translated by an expert translator into Yoruba language using the five-step guidelines proposed by Guillemin *et al*., 1993[5] in this study. The guidelines were followed in a sequential order as follows:

i. Forward translation: Forward translation of the items of the English version of the QVAS into Yoruba language was done by two professionally qualified translators from African and Linguistics Department, OAU, who are bilingual in both Yoruba and English languages. This stage involves two forward translations, T1 and T2
ii. Synthesis: The two Yoruba versions of QVAS were assessed by the two translators for clarity, common language usage and conceptual equivalence. A harmonised Yoruba version (T-1, 2) was produced after a reconciliation meeting between the two translators and the researcher
iii. Back translation: The synthesised version (T-1, 2) was then translated back into English by two independent qualified translators to highlight inconsistencies in the words and concepts of the synthesised version. This was referred to as BT1 and BT2
iv. Expert committee review: An expert committee comprising of the researcher and all the four translators was set up to discuss issues on linguistic equivalence between the original English version and the back-translated version of QVAS. A consensus was reached and the pre-final version of the QVAS-T was developed
v. Pre-final testing: The pre-final version of the QVAS-T was administered to 15 Yoruba-speaking patients with non-specific LBP for cognitive debriefing. The pre-final testing was aimed to assess the patients' perception, understanding and interpretation of translated items and the terminology used. This was to explore both meaning of the items and responses to ensure that the adapted version still retained its equivalence to the items of the English version. Reports were prepared at each stage to cover issues that were faced and how they were resolved.

The validity of the final adapted QVAS-Y was assessed among 100 Yoruba-speaking patients with non-specific LBP. The translated version was administered through face-to-face interview with paper and pen at each clinic and was re-administered on 51 of the patients at an interval of 1 week to assess its test–retest reliability.

Data analysis

Data were analysed using descriptive statistics of mean, standard deviation and percentages. Inferential statistics of intraclass correlation (ICC) coefficient was used to assess the construct and external validity of QVAS-Y. ICC and Cronbach's alpha were used to determine the test–retest reliability and internal consistency of QVAS-Y, respectively. A scattered plot was used to depict the relationship between the English and Yoruba QVAS. Data analysis was carried out using SPSS (Statistical Package for Social Sciences) version 23.0 (IBM Corp , Armonk, NY). Level of statistical significance was set at $P < 0.05$.

RESULTS

A total of 100 patients (36 males and 64 females) participated in the construct validity study while 51 participants were involved in the test–retest reliability of the QVAS-Y. General characteristics of the participants are presented in Table I. The mean age, weight, height and BMI was 55.8 ± 10.8 years, 71.5 ± 11.5 kg, 1.64 ± 0.07 m and 26.6 ± 4.51 kg/m², respectively.

The ICC coefficient of the relationship between the English and the QVAS-Y is presented in Table II. The overall ICC score of the QVAS-Y was r = 0.896, P = 0.001. The item-by-item correlation score ranged from 0.465 to 0.896. Figure 1 shows the scatter chart of the correlation between the English version and QVAS-Y.

The internal consistency and test–retest reliability of the QVAS-Y within 1-week interval was assessed using Cronbach's alpha coefficient and ICC, as presented in Table III. The correlation value for the external validity of the QVAS-Y using ODI was r = 0.341, P = 0.001.

DISCUSSION

QVAS is a reliable and valid method for pain measurement, and it has the advantage of being brief and easy to administer, thus facilitating its use in clinical settings and research.[9] Although outcome measurement such as QVAS is essential to monitoring and improving the quality and effectiveness of intervention,[10] the use of outcome measures is limited in Nigeria[11] possibly because of high illiteracy levels, unawareness of importance of outcome measures and most importantly unavailability of measurement tools in local languages. Most outcome measures are written in foreign languages, which necessitates translation into local languages. However, direct translation of an outcome measure developed for one language or culture to another language without cultural adaptation to a local community, language or culture may not result in a valid instrument.[12,13]

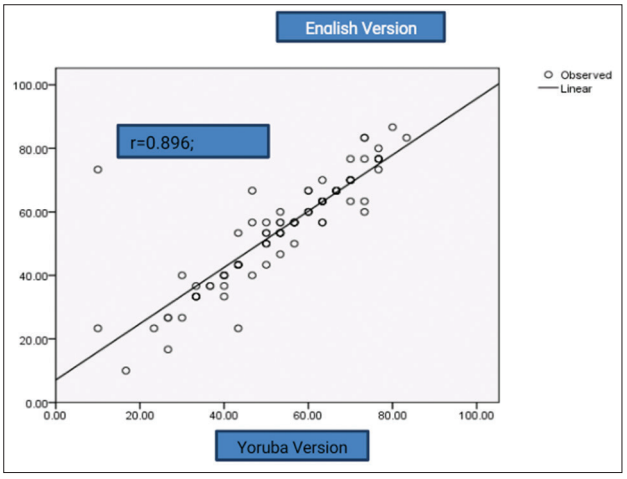

Figure 1: Scatter chart depicting a strong positive linear relationship between the English and Yoruba versions of the Quadruple Visual Analogue Scale

The objectives of this study were to cross-culturally adapt the QVAS into Yoruba language and examine its psychometric properties.

The average age of the patients in this study (55.8 ± 10.8 years) represents the age in which LBP is prevalent as earlier reported by van Tulder that LBP incidence increases with age.[14] On the other hand, the prevalence of LBP is about 10%–25% among middle-age and teenagers as LBP can occur in any age group.[15] The occurrence of LBP in individuals in this age group is as a result of their high activities of daily life, which make them more prone to various stresses.[15]

The face validity of QVAS-Y, which refers to the degree to which the questionnaire actually looks as though it is an adequate reflection of the construct to be measured,[16] was determined by analyses through a focus group, while the content validity, which assesses the degree in which the content of a questionnaire is an acceptable reflection of the construct to be measured,[16] was established by pre-testing the translated version among Yoruba population as recommended by Schellingerhout *et al*.[17] The concurrent validity of the QVAS-Y was high and comparable with the value reported in a similar study by Roux.[5] The correlation value of QVAS-Y is >0.70, which is considered an acceptable validity for a new tool.[18] The lowest item scale correlation in this study is 0.46, which is greater than the minimum value of 0.40 as recommended by Ware and Gandek[19] for a good item scale correlation. The result of the external validity of the QVAS-Y with ODI showed a moderate correlation (r = 0.341, P = 0.001). External validity of a new tool is determined in order to assess its correlation with other instruments measuring the same theoretical hypotheses of the concepts. This tool has adequate test–retest reliability and internal consistency (r = 0.66; α = 0.76) in comparable to a similar study translating and adapting QVAS to Afrikaans language.[5] In this study, participants were followed up after a week as stipulated in the literature for reliability testing, which is long enough to avoid recall bias.[20] The duration of the follow-up in this study is comparable to duration that was reported in similar studies.[5,21]

Limitations of this study may include mode of administration of questionnaire which has been shown to have effect on patient-reported outcomes,[22] so further study may be needed to assess the psychometric properties of QVAS-Y using different modes of administration apart from the face-to-face interview used in this study. In addition, further studies among population with various health conditions may be needed to validate findings of this study. The result of the external validation in this study should be treated with caution as QVAS is a multidimensional pain assessment tool, whereas ODI is a unidimensional tool for activity limitation. Notwithstanding, combining tools of different orientations or those that measure different constructs are used in external validation, in similar way as implemented in this study.

Despite these limitations, this study ensures availability of a measurement tool (QVAS-Y) that is socially and culturally

Table I: General characteristics of the participants (*n*=100)

Variables	Male (*n*=36), mean±SD	Female (*n*=64) mean±SD	*t*	*P*	All participants, mean±SD
Age (years)	57.7±11.6	54.8±10.2	1.294	0.269	55.8±10.8
Weight (kg)	73.4±11.6	70.5±11.4	1.244	0.770	71.5±11.5
Height (m)	1.67±0.07	1.62±0.06	3.540	0.013	1.64±0.07
BMI (kg/m²)	26.4±4.74	26.8±4.41	−0.0386	0.669	26.6±4.51

SD: Standard deviation, BMI: Body mass index

Table II: Concurrent validity of the Yoruba-translated version of the Quadruple Visual Analogue Scale (*n*=100)

Variable	Correlation (*r*)	95% CI		*P*
		Lower class	Upper class	
Overall	0.896	0.849	0.929	0.001*
Item 1	0.856	0.793	0.900	0.001*
Item 2	0.870	0.813	0.911	0.001*
Item 3	0.622	0.420	0.765	0.001*
Item 4	0.465	0.220	0.655	0.001*

*Significant correlation at α=0.05. CI: Confidence interval

Table III: Test-retest reliability and internal consistency of the Yoruba version of Quadruple Visual Analogue Scale (*n*=51)

Variable	Test-retest reliability (*r*) (ICC; 95% CI)	Internal consistency, A
Overall	0.622	0.767
Item 1	0.465	0.635
Item 2	0.655	0.791
Item 3	0.623	0.768
Item 4	0.668	0.801

QVAS: Quadruple Visual Analogue Scale, CI: Confidence interval; ICC: Intraclass correlation, α: Cronbach's alpha

acceptable among the Yoruba-speaking population. This, in turn, will help healthcare professionals to properly assess, manage and provide accurate indications of pain severity and evaluate patients' progress in order to direct resources and interventions appropriately in this population.

CONCLUSION

The concurrent validity, reliability and internal consistency of the QVAS-Y are adequate to assess pain among Yoruba population.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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APPENDIX

Appendix 1: The translated Yoruba version of Quadruple Visual Analogue Scale

ÌWÒN ÀFOJÚRÍ ASÒNKÀ

Ìtósónà: -Jòwó, fi àmì kan si orí ìlà tí ó bá se àpèjúwe ìdáhùn tí ó bá bá o mu jù lo. Bí ohun tó ń se ó bá ju òkan lo, jòwó dáhùn ìbéèrè kòòkan fún ohun kòòkan tó ń se ó, kí o sì fi ìwòn ìmòlára rè hàn. Fi ìwòn bí ìrora re se máa ń tó hàn; èyí tó kéré jù lo/èyí tó ga jù lo láàrin osù méta tó kojá. Bí o bá ti gba fóòmù yìí télè rí, fi bí ìwòn ìrora rè se máa ń tó láti ìgbà náà hàn. Fún àpeere:

Orí fífó orùn ríro èyìn dídùn

Kò sí ìrora _____ Ìrora tó burú jù lo

##########

1. Kí ló jé ìrora re báyìí?

Kò sí ìrora _____ ìrora tó burú ju lo

2. Irúfé ìrora wo gan-an ní pàtó tàbí díè lo sábà máa ń ní?

Kò sí ìrora _____ ìrora tó burú ju lo

3. Báwo ni ìrora re se máa ń tó bóbá burú tán?

Kòsí ìrora _____ ìrora tó burú ju lo

Ìdá mélòó nínú ogórùn-ún niìwòn ìrora re tó máa ń ga die ní àwon wákàtí tí o kò bá sùn? %

4. Kíni ìwòn ìrora re tó BURÚ JÙ LO?

Kò sí rora _____ ìrora tó burú ju lo

Ìdá mélòó nínú ogórùn-un ni ìwòn ìrora re tó máa ń ga jù lo ní àwon wákàtí tí o kò bá sùn?

Fi àmì sí àwòrán yìí báyìí:

A - ara ríro

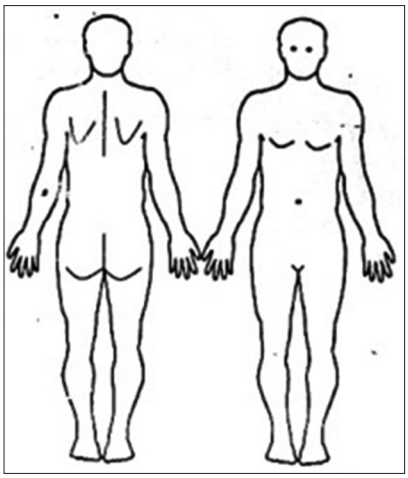
B - ara títa

N - kí a má mò bóyá nnkan kan gún ènìyàn

P - àìtórí-abéré

S - gígúnra eni lobe

O - àwon mìíràn se àpèjúwe won



ORÚKO _____OJÓ ORÍ_____ DÉÈTÌ _____MÁÀKÌ_____

Ìwòn: #1 _____ +#2 _____+#4 _____ = _____/3 x 10 _____

(Ìwòn kékeré = < 50; ìwòn gíga = > 50).

QUADRUPLE VISUAL ANALOGUE SCALE-ENGLISH VERSION

Instructions: Please circle the number that best describes the question being asked.

Note: If you have more than one complaint, please answer each question for each individual complaint and indicate the score for each complaint. Please indicate your pain level right now, average pain and pain at its best and worst.

Example:

Headache Neck Low back

No pain _____ worst possible pain

1 – What is your pain RIGHT NOW?

No pain _____worst possible pain

2 – What is your TYPICAL or AVERAGE pain?

No pain _____ worst possible pain

3 – What is your pain level AT ITS BEST (how close to '0' does your pain get at its best)?

No pain _____ worst possible pain

What percentage of your awake hours is your pain at its best? _____%

4 – What is your pain level AT ITS WORST (how close to '10' does your pain get at its worst)?

No pain _____worst possible pain

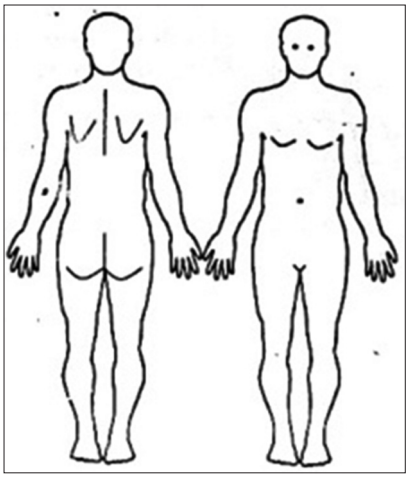
What percentage of your awake hours is your pain at its worst? _____%

Please indicate by using the terms below what type and where your pain is.

B = Burning P = Sharp

A = Achy N = Numbness

S = Stiffness T = Tingling



Name _____ Age _____ Date _____ Mark _____

Score: #1 _____ +#2 _____ +#4_____ = _____/3 × 10 _____

(Low intensity = <50; high intensity = >50)