



The Internet Journal of Allied Health Sciences and Practice

<http://ijahsp.nova.edu>

A Peer Reviewed Publication of the College of Allied Health & Nursing at Nova Southeastern University

Dedicated to allied health professional practice and education

<http://ijahsp.nova.edu> Vol. 7 No. 3 ISSN 1540-580X

Translation and Alternate Forms Reliability of the Visual Analogue Scale in the Three Major Nigerian Languages

Adesola C. Odole, BMR, MSc, PhD¹
Aderonke O. Akinpelu, BSc, MEd, PhD²

1. Lecturer, Department of Physiotherapy, College of Medicine, University of Ibadan
2. Senior Lecturer, Department of Physiotherapy, College of Medicine, University of Ibadan

Nigeria

CITATION: Odole, AC., Akinpelu, AO. Translation and Alternate Forms Reliability of the Visual Analogue Scale in the Three Major Nigerian Languages. *The Internet Journal of Allied Health Sciences and Practice*. July 2009, Volume 7 Number 3.

ABSTRACT

Purpose: Our aims were to translate the anchors on the Visual Analogue Scale (VAS) into the three major Nigerian Languages and determine the adequacy of the alternate forms reliability of the VAS in these translations. **Methods:** The anchors on the VAS were translated into Yoruba, Igbo, and Hausa languages by linguistic experts and taken through back translation, clinical committee review, and pre-testing. Sixty-seven Hausa, 54 Igbo, and 165 Yoruba Knee/Hip OA patients were assessed on the original and translated versions of VAS. Scores on each translated anchor of the VAS were correlated with scores on the original VAS (anchors in English language) to assess the alternate forms reliability of the VAS in these translations. **Results:** The subjects 31 males, 134 females [Yoruba]; 17 males, 50 females [Hausa]; and 20 males, 34 females [Igbo] were aged 56.1 + 10.1, 54.3 + 6.4 and 52.8 + 13.9 years respectively. Significant positive correlations existed between each of the translated anchors and the original English Version [$r = 0.63$; $P < 0.05$ [Yoruba]; $r = 0.98$, $P < 0.05$ [Hausa]; $r = 0.93$; $P < 0.05$ [Igbo]. **Conclusion:** The VAS, when its anchors are translated into Yoruba, Hausa, and Igbo languages, is reliable and therefore recommended for use in the Nigerian clinical settings.

INTRODUCTION

Pain is a complex, subjective, personal experience.¹ The International Association for the Study of Pain has defined pain as an unpleasant and emotional experience associated with actual potential tissue damage or described in such damage.² Pain is a highly subjective experience, and the response to noxious stimuli will be modified by psychological factors such as state of mind, past experience and conditioning influences, and sociological factors such as gender and culture.³

Pain is the most important symptom of OA (a prevalent musculoskeletal condition) and the reason why sufferers from the disease seek treatment.⁴ Despite the subjective nature of the pain experience, there is the need to assess and measure pain intensity so as to objectively evaluate the course of disease and the effectiveness of therapeutic interventions. The quantification of this pain experience by physiotherapists remains an important component of outcome measures in physiotherapy.^{5,6}

Many scales have been developed to provide a quantifiable measure of pain.⁷ Measures of pain are primarily classified as behavioral and subjective. Other measures include the biological and non-subjective measures. Essentially, they are used to quantify the pain perception of individuals experiencing pain. The accuracy of the assessment is dependent on the efforts of the health care provider and the person experiencing pain.⁸ These measures of pain include the Visual Analogue Scale, the Numerical Pain Scale and the McGill Pain Questionnaire.⁹⁻¹² The Visual Analogue Scale (VAS) is the most common simple scale used in pain research.¹ It represents the intensity dimension by a 10 cm plain line with two anchor points of "no pain" and "worst

pain I ever felt." The patient is requested to draw a line at the point that best describes his or her pain level. It is the most widely used scale in the assessment of pain in the clinical setting and has been reported to be sensitive and reliable.¹³⁻¹⁵ Many studies have been carried out on the VAS in various populations.¹⁶⁻²¹

Unfortunately, there are not many of such published studies from the Nigerian environment. Soyawo et al has reported that the VAS is comprehended by Nigerians, irrespective of their educational status.¹⁷ Nigeria is a multi-ethnic country with over 500 indigenous languages. The three major Nigerian indigenous languages are Hausa, Igbo, and Yoruba.²² Although the VAS has been clinically utilized within the Nigerian context, there have been few published studies on the translation and the alternate forms reliability of this scale into major Nigerian languages in order to further encourage its use within the Nigerian context. The aims of this study were to translate the anchors on the VAS into Yoruba, Hausa, and Igbo languages [major Nigerian languages] and determine the adequacy of the alternate forms' reliability of the VAS in these translations as applied to the Nigerian patients. We hypothesized that there would be no significant correlation between the participants' scores on each of the Yoruba, Hausa, Igbo, and English version of VAS.

MATERIALS AND METHODS

The University of Ibadan/University College Hospital Institutional Review Committee approved the study and informed consent of all the participants was sought and obtained.

Translation of anchors on the VAS into Yoruba, Hausa, and Igbo

We followed the recommended guidelines for the process of translation of self-report measures by Beaton et al²³ to translate the anchors on the VAS into Yoruba, Hausa, and Igbo languages. The VAS [English, appendix 1] was translated into Yoruba, Hausa, and Igbo by linguistic experts who were knowledgeable on the construct of pain assessment. The English VAS was given to Yoruba and Igbo linguistics experts from the Department of Linguistics and African Studies, University of Ibadan, Nigeria, to translate the anchors into Yoruba and Igbo languages and a Hausa linguistic expert from the Ahmadu Bello University, Nigeria to translate the anchors into Hausa language. Copies of the Yoruba, Hausa, and Igbo translated anchors of the VAS were given to ten bilingual persons [five for Yoruba, two for Igbo, and three for Hausa] who were not associated with the forward-translation process to back translate the translated anchors into English. Copies of the back-translated versions were reviewed by a clinical committee of two bilingual physical therapists and three OA Knee/Hip patients for each of the translated anchors. It was discovered that the meanings of the anchors were unaltered. Each of the translated anchors was pre-tested on 5 patients with OA Knee/Hip to test for clarity of the languages. The translations are as presented in appendix 2.

Alternate forms reliability of VAS in the Yoruba, Hausa and Igbo translated versions

Two hundred and eighty-six outpatients with symptomatic OA of the Knee/Hip with no evidence of cardiovascular disease or concurrent neuromuscular and musculoskeletal diseases who attended the outpatient unit of the physiotherapy departments in eleven different hospitals representing three tertiary hospitals and two secondary hospitals located in the Southwestern region of Nigeria, one tertiary hospital and two secondary hospitals located in the Eastern region of Nigeria, and one tertiary hospital and two secondary hospitals located in the Northern region of Nigeria participated in this correlational study. The patients were 67 Hausa, 165 Yoruba, and 54 Igbo speaking individuals with Knee/Hip OA. They were bilingual persons who could speak and read English plus at least one of Yoruba, Igbo, and Hausa languages. They were recruited through a purposive sampling technique. Both English and each of the translated anchors of VAS were assessed by the participants. The fish-bowl technique was used to determine the order of assessment of the English and each of the translated versions of VAS.

DATA ANALYSIS

Correlation between VAS scores on the original [English] and each of the translated anchors were analyzed using the Spearman Rank order correlation. Level of significance was set at $p < 0.05$.

RESULTS

The subjects, 31 males, 134 females [Yoruba]; 17 males, 50 females [Hausa]; and 20 males, 34 females [Igbo] were aged 56.1 ± 10.1 , 54.3 ± 6.4 and 52.8 ± 13.9 years respectively [Table 1].

There were significant positive correlations between each of the translated anchors and the original English Version [$r = 0.63$ (CI 0.49 – 0.69); $P < 0.05$ [Yoruba]; $r = 0.98$ (CI 0.98 – 0.99), $P < 0.05$ [Hausa]; $r = 0.93$ (CI 0.87 – 0.95); $P < 0.05$ [Igbo].

Table 1: Age and Gender of Participants

Subjects	Gender		n	\bar{x}	Age	SD
	Male	Female				
Yoruba	31	134	165	56.1		10.1
Hausa	17	50	67	54.3		6.4
Igbo	20	34	54	52.8		13.9

DISCUSSION

The usefulness of the VAS for pain assessment has been confirmed in research studies and in clinical practice based on extensive analysis of its measurement properties.^{6,14-17} Thus, its translation into the 3 major Nigerian languages should contribute to the effectiveness of its use in Nigeria and similar clinical settings. During the process of translating the anchors in the English version of the VAS into Yoruba, Hausa, and Igbo languages, the meanings of all items were retained in the back translation of the reconciled translated versions, and all the patients involved in the pre-testing reported no difficulty in clarity of the language and ease of understanding of all the items. This could be because there are only two items on the VAS (no pain, worst pain I ever felt). However, the reading level of the patients was not considered while embarking on this study; this could be regarded as a limitation of this study.

The VAS in itself cannot be translated since it is a continuum; however, the anchors can be translated and such translations can then be assessed for equivalence. According to Beyer et al, 2005, the alternate forms reliability is a measure of such equivalence for translations. Alternate forms reliability is classified as a measure of "equivalence" in reliability testing.²⁶ It is a measure of the consistency of scores obtained when two seemingly similar instruments are administered on the same set of individuals concurrently, and scores obtained are hitherto compared. A strong positive coefficient of correlation between the participants' scores provides evidence of the alternate forms reliability. In this study, the VAS in each of the translated versions was assessed for measurement equivalence with the English version. This is a measure of the alternate forms reliability of the VAS.²⁶ On a multi-item scale, alternate forms reliability involves the development of a second equivalent form of a tool to estimate consistency. Correlation of participants score on both forms of the tool is indicative of the reliability estimate. If the second tool is truly an equivalent form of the original tool, it would be expected that the alternate forms reliability would be high as indicated by a strong positive coefficient of correlation between the participant's scores on the two tools.²⁴⁻²⁸

According to the guidelines of Beaton et al on translation of measuring instruments, the psychometric property of validity of these translated versions has to be proven before such can be used for outcomes assessment.²³ The moderate/ relatively high correlation coefficients between the Yoruba, Hausa, and Igbo translated anchors of the VAS and the English VAS was expected because they all assessed the same construct of pain intensity. The scores obtained on the Yoruba, Hausa, and Igbo versions correlated significantly with those on the English version. This rejects the hypothesis that there would be no significant correlation between each of the translations and the English (original) VAS. The moderate/ strong correlation between the three translated versions and the English version further confirmed that the conceptual equivalence of the items in each of the translated versions and English are similar.

The correlation coefficients of 0.63 between the Yoruba translation and English version of VAS found in this study does not fall within acceptable values (>0.7) for strong correlations of alternate forms reliability; however, the value indicates a moderate correlation between the two versions.²⁴⁻²⁸ This can be explained considering the confidence interval of 55.30-61.75 on a sample size of 134 patients. A *p* value of .05 or less was considered statistically significant. Correlations of 0.3 or less were considered weak or low, correlations between 0.31 and 0.69 were considered moderate, and correlations of 0.7 or greater were considered strong.²⁶ According to many sources a coefficient of 0.7 is adequate for reliability and 0.8 or greater is highly desirable.²⁴⁻²⁸ If the tool is to be used to make clinical decisions, such as in the treatment of pain, the reliability coefficient should be 0.9 or greater.²⁷ The correlation coefficients of 0.98 and 0.93 for the Hausa and Igbo versions respectively indicates a strong correlation between each of these versions and the English version of VAS.²⁴⁻²⁹

Very few studies have been carried out on alternate forms reliability of outcome measures. In a study on the alternate forms reliability of the Oucher pain scale, Beyer et al found a correlation coefficient of 0.88 – 0.99.²⁶ This result is similar to the findings of McCallum and Bracken in their study on alternate form reliability of the PPVT-R for white and black preschool children.²⁸ In that study, 72 preschool children were assessed on the PPVT-R, and the correlation coefficients ranged between 0.74 to 0.86. Schmidt et al reported a strong correlation between the Dementia rating scale-2 (DRS-2) and the alternate form (DRS-2AF) while assessing the alternate form reliability of the DRS-2.²⁹

The usefulness of the VAS is evident among patients with OA who speak different languages in the Nigeria clinical setting. Other aspects of measurement properties are important to establish further evidence of psychometric properties of these translations but were not tested in this cross-sectional study. These include predictive validity, divergent and convergent construct validity, and psychometric property of test-retest reliability and responsiveness to change.

CONCLUSION

The Yoruba, Hausa and Igbo translated anchors of the VAS demonstrate adequate alternate forms reliability. These translations can be considered for use in the Southwestern, Northern and Eastern regions of Nigeria to encourage the use of VAS in the Nigerian and similar clinical settings. Further studies should be carried out to assess the alternate forms reliability of the VAS in other translations in different populations to further encourage its use in such populations.

REFERENCES

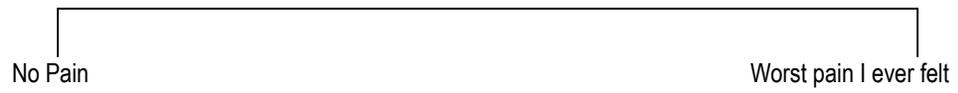
1. Conn DA. Assessment of acute and chronic pain. *Anaesthesia int care med*. 2005; 6(1): 14 – 15.
2. Readyard IB, Edwards WT. Management of acute pain: a practical guide. *Int Assc stud pain publication*. 1992; Seattle: 2.
3. French S. Some physiological and sociological aspects of pain. *Physio*. 1989; 75: 255 – 259.
4. Creamer P. Osteoarthritis pain and its treatment. *Current Op Rheumatology*. 2000;12, 450 – 455.
5. Akinpelu AO, Olowe OO. Correlative study of 3 pain rating scales among obstetric patients. *Af J Med Med Sci*. 2002; 31: 123 – 126.
6. Olaogun MOB, Adedoyin RA, Ikem IC et al. Reliability of rating lowback pain with a visual analogue scale and a semantic differential scale. *Physio Theory Prac*. 2004; 20:135-142.
7. Wee HL, Fong KY, Tse C et al. Optimizing the design of the visual analogue scales for assessing quality of life: a semi-qualitative study among Chinese speaking Singaporeans. *J of Eval Clin Practice*. 2008;14(1) 121-125
8. Price DD, Bush FM, Long S et al. A Comparison of pain measurement characteristics of mechanical visual analogue and single numerical rating scales. *Pain*. 1994; 56: 217 – 226.
9. Vonkoff M, Deyo RA, Cherkn D et al. Back pain in primary care: Outcomes at one year. *Spine*. 1993;18: 855 – 862.
10. Chapman-Smith D. Measuring results – The new importance of patient questionnaires. *Chiro Report*. 1992; 7 (1): 1 – 6.
11. Melzack R. The Short – form McGill pain Questionnaire. 1987; 30: 191 – 197.
12. Melzack R. *Pain Measurement and Assessment*. 1982; New York, NY: Raven press.
13. Scott J, Huskisson EC. Graphic representation of pain. *Pain*. 1976; 2: 175 – 84.
14. Price DD, McGrath PA, Raffii A. The validation of Visual analogue scales as ratio scale measures for chronic and experimental pain. *Pain*, 1983; 17, 45 – 46.
15. Sloman R, Rosen G, Rom M et al. Nurses' assessment of pain in surgical patients. *J Adv Nursing*. 2005; 52 (2) : 125 – 132.
16. Nusbaum L, Natour J, Ferraz MB et al. Translations, adaptation and validation of the Roland-Morris questionnaire – Brazil Roland-Morris. *J Med Bio Res*. 2001; 34: 203-210.
17. Soyawo OA, Amanor – Boadu SD, Sanya AO et al. Pain assessment in Nigerians – Visual Analogue Scale and Verbal Rating Scale Compared. *W Afr J Med*. 2000; 19(4) 242-245.
18. Jelsma J, Fergusson G. The determinants of self-reported health-related Quality of Life in a culturally and socially diverse South African community. *Bull World Health Organ*. 2004; 82 (3): 206 – 212.
19. Mannon AF, Junge A, Fairbank JC et al. Development of a German Version of the Oswestry Disability index part 1 : Cross-Cultural adaptation, reliability and validity. *Euro Spine J*. 2006; 15 (1) 55 – 65.
20. Xie F, Thumboo J, Lo NW, Yeo SJ et al. Cross Cultural Adaptation and Validation of Singapore English and Chinese Versions of the Lequesne Algofunctional Index of Knee in Asians with Knee Osteoarthritis in Singapore. *Osteoarthritis and Cartilage*. 2007; 15: 1019-1024.
21. Aratake Y, Tanaka K, Wada K. et al. Development of Japanese Version of the Checklist individual strength questionnaire in a working population. *J Occ Health*. 2007; 49 (6):453 –460.
22. Babajide OA. *Language attitude patterns of Nigeria in Language attitude and language conflict in West Africa Igboanusi H*. 2001; Eni crownfit publisher: S. Ibadan: 1 – 13.
23. Beaton DE, Bombardier C, Guilleman F, Ferraz MB. Guidelines for the process of Cross-Cultural adaptation of Self-Report Measures *Spine*. 2000; 25: 3156-3191.
24. Carmines EG, Zeller RA. *Reliability and validity assessment*, Newbury Park, CA; 1979: Sage.
25. Nunnally JC, Bernstein IH. *Psychometric theory* (3rd Ed). 1994;. New York: McGraw Hill.
26. Beyer JE, Turner SB, Jones L, Young L, Onikul R, Bohaty B. Alternate forms reliability of the Oucher pain scale. *Pain Manag Nurs*. 2005; 6 (1):10-17
27. Polit D, Beck C. *Nursing research: principles and methods* (7th Ed).2004; Philadelphia: Lipponcott Williams and Wilkins.
28. McCallum RS, Bracken BA. Alternate form reliability of the PPVT-R for white and black pre school children. *Psych in Schools*. 2006; 18 (4) 422-425.

-
29. Schmidt KS, Mattis PJ, Adams J. Alternate-form reliability of the Dementia Rating Scale-2 (DRS-2). *Archives Clin Neuropsych.* 2005; 20 (4) 435-441.

Appendix 1

VISUAL ANALOGUE SCALE

English

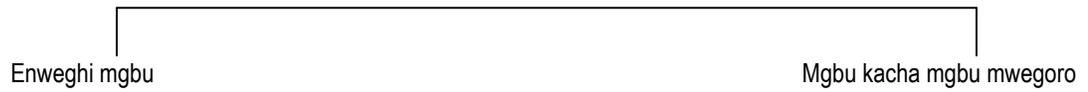


Appendix 2

Yoruba



Igbo



Hausa

