

Full Length Research Paper

Cross-Cultural Adaptation of Activity-Specific Balance Confidence (ABC) Scale for Igbo Stroke Survivors

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Individuals post stroke are at high risk for devastating consequences from falls especially while performing their activities of daily living. This is due to postural instability and abnormal gait pattern resulting from balance impairment acquired post injury. The Activity-Specific Balance Confidence (ABC) scale is an instrument used to measure confidence in balance that hitherto was not available in Igbo language. Hence this study was designed to psychometrically test a cross-culturally adapted ABC scale for Igbo stroke survivors (SS). A total of 40 participants, involving 20 SS and 20 age- and sex-matched normal subjects completed an Igbo version of the ABC scale. The internal consistency and test-retest reliability of the Igbo translated ABC tool were assessed using cronbach- α and Spearman correlation respectively while the construct and criterion-related validities were evaluated using independent t-test and Spearman correlation respectively. Level of significance was set at $\alpha = 0.05$. The items of the ABC instruments, demonstrated an excellent internal consistency with a Cronbach's alpha of 0.90. The ABC Igbo version had an excellent test-retest reliability ($r = 0.003$, $p = 0.001$), criterion-related validity ($r = 0.948$, $p = 0.001$) and construct validity ($t = 17.643$, $p < 0.001$). Igbo translated version of the ABC scale is a reliable and valid tool for assessing balance confidence among stroke survivors.

Keywords: Balance Confidence, Igbo, Activity-Specific Balance Confidence Scale, Psychometric Testing, Stroke Survivors.

INTRODUCTION

Balance refers to the condition in which all forces acting on the body are balanced in a way that the Centre of mass falls within stability limits (Hamzat and Ekechukwu, 2015; Karishma, et al., 2019). Balance

emerges from a complex interaction of sensory/perceptual systems responsible for detection of body position and motion, motor systems responsible for organization of and execution of motor synergies,

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and higher-level CNS processes responsible for integration and action plans (Susan, et al., 2014; Hamzat et al, 2014). Balance deficits are common with individuals post stroke and thus contribute to reduced ambulatory activities (Michael, et al., 2005). Regaining ambulatory capacity after stroke requires confidence in gait and balance as well as in handling near-fall events (Annette and Ylva, 2013). Balance confidence has been defined as a cognitive component of fear of falling where older adults subjectively estimate their ability to avoid a fall or maintain their balance (Ekechukwu et al, 2017; Karishma, et al., 2019). Because falls are associated with fear of falling and balance confidence, Friedman, et al. (2002) measurement of an individual's confidence in their balance is an important component of clinical practice for physical therapists in stroke rehabilitation.

The Activities-specific Balance Confidence (ABC) scale was designed to measure balance confidence and takes approximately 20 minutes to complete (Powell and Myers, 1995). The ABC scale is a standardized 16-item questionnaire in which respondents are asked to rate their level of confidence in maintaining balance and remaining steady while performing specific activities in the home and outside it (Streiner and Norman, 2003). These activities vary in difficulty and are performed during position changes, standing, or walking (Solveig, et al., 2010). Individuals rate their confidence that they "will not lose their balance or become unsteady" when performing each daily task (item) on the scale from 0% (low confidence) to 100% (high confidence) (Bryant and Craig, 2019). A total score is calculated by averaging scores from all 16 items. The ABC scale has been adopted in clinical practice and in research, although cross-cultural differences may impose difficulties when using it in different countries as is recommended that a self-reported measure be translated and adapted to the appropriate culture before it is used with subjects whose first language is not English (Guillemin, et al., 1993). Furthermore, while culturally adapting the scale is necessary, it is important that changes do not alter the original intent, which requires it to be broad, comprehensible and applicable to the entire population (Amelia, et al., 2013). Apart from the English version, Powell (1995), the ABC scale has been translated and adapted into French-Canadian, Salbach et al. (2006), Chinese, Mak et al. (2007), German, Schott, (2008), Turkish, Ayhan et al. (2014), British English, Parry, et al. (2001), and Brazilian Portuguese, Marques, et al. (2013). Availability of self-administered scale in a native language would make research and the clinical management more effective. Igbo is the principal native language of the Igbo people, an ethnic group of south-eastern Nigeria (Marufat, et al., 2020). It is spoken by about 27 million speakers mostly from eastern Nigeria and minority language in Equatorial Guinea (Eberhard,

et al., 2019; Slattery, 2010). Igbo is one of the most widely spoken languages of West Africa and belongs to the Benue-Congo group of the Niger-Congo language family (Eberhard,et al., 2019). There are approximately thirty Igbo dialects which vary considerably with the standard literary form that is based on the Owerri and Umuahia dialects (Eberhard, et al., 2019). The primary Igbo States in Nigeria are Anambra, Abia, Ebonyi, Enugu and Imo States. As Igbo is the most-spoken languages in the Eastern Nigeria, translating and adapting the ABC scale to the Igbo population while accounting for its psychometric properties is an important task so as to make clinical management more effective. Hence, this study was designed to psychometrically test a cross-culturally adapted ABC scale for Igbo stroke survivors.

METHODS

Participants

In total, the study involved 40 participants, 20 community-dwelling stroke survivors recruited from tertiary hospitals in Enugu, South-east, Nigeria, and 20 community-dwelling age- and sex-matched normal individuals as control. The subjects were only recruited if (i) they have no other neurological condition that could influence reintegration other than stroke (for the stroke survivors only) (ii) they were able to communicate in English and Igbo languages conveniently and (iii) were community-dwelling adults.

Activity-Specific Balance Scale

The Activities-specific Balance Confidence (ABC) scale is an instrument developed to numerically quantify the level of confidence in performing specific activities without losing balance or becoming unsteady (Powell and Myers, 1995; Myers, et al., 1998; Lajoje, et al., 2002; Lajoje and Gallagher, 2004). The scale was originally devised in English by Powell and Myers in 1995 for the population of Canada. It is a subjective measure of balance confidence in performing various ambulatory activities without falling or experiencing a sense of unsteadiness. The activity-specific balance confidence scale is a 16-item, self-reporting measure, in which patients rate their confidence of balance in performing certain activities. The items are rated on a linear scale that ranges from 0 to 100. A score of 0 represents no confidence and a score of 100 represents complete confidence. The overall score is calculated by adding individual item scores and then dividing by the total number of items (Powell and Myers, 1995).

Procedure

Ethical clearance was sought and obtained from Health and Research Ethics committee of the University of Nigeria Teaching Hospital, Enugu. Informed consents of all the participants were duly sought and obtained. Forward and back translations were done by two linguists from the department of Nigeria and African Languages, University of Nigeria. The consensus back translation into the original language was done by two independent translators who were blinded to the forward translation.

Data analysis

The data were analyzed using version version 20 of the SPSS

software suit. Descriptive statistics of frequency and percentages were used to summarize the demographic and clinical variables of the participants. Internal consistency and test-retest reliability were evaluated using Cronbach's alpha coefficient and Spearman's correlation coefficients respectively. Also, Spearman's correlation coefficient and independent t-test were used to establish the criterion-related and construct validities of the Igbo translated version of the ABC scale. The level of significance was set at 0.05.

RESULTS

Characteristics of the subjects

In this study, majority of the participants were male (60%), and between 55-69 years (70%). Among the stroke survivors, most of them had ischaemic type of stroke (70%) predominantly on the left sides of their bodies (60%), most of them have had the condition for 3-4 years (45%) and received physiotherapy for 4–7 months (40%) as shown in Table 1.

Test-retest Reliability

The Igbo translated version of the ABC instruments test-retest reliability were established by correlating the scores obtained on two consecutive administrations of the instruments using spearman correlation. There was a strong correlation between the tests of the translated instruments ($r = 0.910$, $p = 0.001$) as shown in Table 2.

Criterion-related validity

There was a strong correlation coefficient between the English version (gold standard) and the Igbo translated version (test scale) of the ABC instrument ($r = 0.948$, $p = 0.001$) as shown in Table 3.

Construct validity

The construct validity of the Igbo translated version of the ABC scale was confirmed by comparing the scores of stroke survivors and the apparently normal control on the scale. The control had a significantly higher scores than stroke survivors ($t = 17.643$, $p < 0.001$) as shown in Table 4.

DISCUSSION

The correct performance of daily life activities, such as walking and manipulating objects, requires good postural control and self-confidence in executing them (Amelia, et al., 2013; Ekechukwu et al, 2020). Stroke survivors experience balance deficits and reduced confidence levels during activities of daily living. This is as a result of physical limitations such as paresis, spasticity and affected sensory functions (Annette and

Ylva, 2013). A commonly used measure of balance self-confidence is the Activities-specific Balance Confidence (ABC) scale (Powell and Myers, 1995). The ABC scale is widely used in stroke rehabilitation (Sullivan et al., 2013) and has psychometric evidence to support its use for quantifying balance confidence in stroke survivors (Beninato, et al., 2009; Botner, et al., 2005; Salbach, et al., 2006; An, et al., 2017; Forsberg and Nilsagard, 2013; Ylva and Annette, 2013). Apart from the English version, this scale has been translated and adapted into Canadian French, Chinese, German, Turkish, British English, and Brazilian Portuguese, Hindi, Gujarat and Swedish (Salbach, et al., 2006; Mak, et al., 2006; Schott, 2008; Ayhan, et al., 2014; Parry, et al., 2001; Amelia, et al., 2013; Jamal, et al., 2016; Karishma, et al., 2019; Annette and Ylva, 2013).

Currently, no measure is available for assessing balance confidence in Stroke patient and older adults whose primary language is Igbo. Igbo language is one of the three major Nigerian native languages spoken by 21% of the population (National Population Commission, 2006a). It is spoken mainly in south-eastern states and in the north-east of Delta State and in the south-east of Rivers State by a total of about 18 million people of the Nigerian population aside other parts of the world (National Population Commission, 2006b). When self-administered scales are not available in the native language of the patient, the therapist is expected to self-translate or interpret the scale to the patient, which may affect the essential construct of the measurement (Karishma, et al., 2019). Additionally, each time a test is translated and applied to a new cultural context, the validity and reliability of the translated version need to be examined (Myers, 1999). The Activities-specific Balance Confidence (ABC) scale is a reliable and valid tool for quantifying balance confidence and fall risk among older adults, stroke, Parkinsons disease, brain injury, vestibular disorder and non-specific patient population (Karishma, et al., 2019).

The study reported a greater distribution of male than female stroke survivors. This could imply that stroke affects more men than women. This is in line with other stroke related studies (Lin et al, 2010; Lin et al, 2011; Akinpelu et al, 2012; Chen et al, 2012). Also, majority of the stroke survivors in this study were above 54years. Age is known to be an important risk factor for all stroke types (Sacco, et al., 1997a). It could equally be said that the chances of stroke likely increases with age. This is similar to the findings of other studies that reported stroke as affecting people in their middle age (Bhatta, 2005b; Pathak, et al., 2006b; Devota, et al., 2006b; Naik, et al., 2006b; Pandit, et al., 2006b; Lima, et al, 2008; Lynch et al, 2008; Boosman et al, 2010; Hamzat et al, 2014). Although stroke risk increases with age as stated from these studies, stroke can occur at any age (Smajlović, 2015; Sacco, et al., 1997b) while

Table 1: Descriptive Analysis of the clinical and demographic data of participants

Variables		Frequency	Percentage
Sex	Male	24	60
	Female	16	40
Age	45-49	6	15
	50-54	2	5
	55-59	10	25
	60-64	10	25
	65-69	8	20
	70-74	4	10
Type of Stroke	Ischaemic	14	70
	Haemorrhagic	6	30
Side of Stroke	Left	12	60
	Right	8	40
Duration of Stroke	≤ 2 years	8	35
	3 -4 years	9	45
	≥ 5 years	1	5
	Unknown	2	10
Duration of PT	≤ 3 months	6	30
	4 – 7 months	8	40
	≥ 8 months	6	30

Table 2: Test-reliability of the Igbo translated version of ABC (n=40)

ABC Scale	N	Mean (Standard Deviation)		Spearman Correlation Coefficient (p-value)
		Test	Retest	
	20	20.09 (20.25)	27.79 (22.58)	0.910 (<0 .001)*

Table 3: Correlation between the Igbo translated version of ABC and the English version

ABC Scale	N	Mean (Standard Deviation)		Spearman Correlation Coefficient	p-value
		English Version	Igbo Version		
	20	20.09 (20.25)	20.09 (20.25)	0.948	< 0.001*

Table 4: Independent sample t-test for the comparison of scores of Stroke Survivors and the Control on the Igbo translated version of the ABC Scale

ABC Scale	X ± SD		t-value	p-value
	Stroke Patients	Control		
	20.09 ± 20.25	100.00 ± 0.00	17.643	P <0 .001

time from stroke varies considerably among the survivors. Duration of stroke is likely to increase with presence of co-morbidities, poor medical care and lack of awareness as in developing countries. Ischaemic type of stroke was reported to be more common than haemorrhagic stroke. This is in agreement with the report of other studies (Vijaya, et al., 2008b; Smith, et al., 2005; Bhatta, 2005c; Pathak, et al., 2006c; Devota, et al., 2006c; Naik, et al., 2006c; Pandit, et al., 2006c) and similar to the report of Andersen et al, (2009) and Ekechukwu, et al (2017), who equally reported ischemic stroke has been more common than haemorrhagic stroke. In addition, majority of the SS had left sided affectation, this is in contrast to other studies (Hedna, et al., 2013; Ahmed, et al., 2018), as they reported right sided affectation.

The result of the study further revealed an excellent internal consistency and test-retest reliability among Igbo stroke survivors since there was a strong correlation between the scores obtained on the two consecutive administration of the ABC instrument. The strong correlation and the agreement between the measurements indicate that the scale is reliable in presenting stable repeated results. This is consistent with previous studies as they reported ABC versions to that also had excellent internal consistencies and test-retest reliabilities (Amelia, et al., 2013; Annette and Ylva, 2013; Ayhan, et al., 2014; Jamal, et al., 2016; Karishma, et al., 2019;).

The study findings showed that the Igbo version of ABC scale has a strong criterion-related validity as there was an excellent correlation between the English version and the Igbo translated version of the ABC. This implies that this Igbo version would be useful and practical when used in a different cultural context for the assessment of balance confidence among Igbo speaking stroke survivors. This support previous studies carried out on psychometric properties of a cross-culturally adapted ABC scale on different groups of individuals (Forsberg and Ylva, 2013; Buyukturan, et al., 2014; Vishal, et al., 2016; Karishma, et al., 2019).

The construct validity of the Igbo version of ABC scale was confirmed by comparing the between scores stroke survivors and their age/sex matched controls. The study revealed that the participants with stroke had significantly lower scores than their age- and sex-matched control. These results therefore revealed that the Igbo ABC version has an excellent construct validity and is therefore useful for assessing balance confidence among Igbo-speaking stroke survivors during activities of daily living given that it can distinguish participation restriction between stroke from

non-stroke survivors. An equally excellent construct validity has been reported for other versions of the ABC scale for use of balance confidence assessment in different languages (Annette and Ylva, 2013; Ayhan, et al., 2014; Jamal, et al., 2016; Karishma, et al., 2019).

CONCLUSION

This study showed evidence that ABC Scale is a reliable and valid tool in assessing balance confidence among Igbo-speaking stroke survivors. It is therefore recommended that this version of ABC scale be used when assessing balance confidence among Igbo-speaking stroke survivors at any stage of their rehabilitation so as to encourage a better and effective management.

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