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Proposing a new stroke-specific screening tool for depression: Examination of construct validity and reliability

Akin Ojagbemi[a,*], Mayowa Owolabi[a], Joshua Akinyemi[a], Bruce Ovbiagele[b]

[a] College of Medicine University of Ibadan, Nigeria
[b] Medical University of South Carolina, United States

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ABSTRACT

Objectives: The optimal tool for identifying depression after stroke is yet to be identified. In the present study, we propose a new context-specific screening tool for PSD and examined its construct validity and reliability within existing data on recent stroke survivors.

Methods: We assessed baseline data being collected as part of an intervention to improve one-year blood pressure control among recent (≤ one month) stroke survivors. Depression was measured using the Hospital Anxiety and Depression Scale (HADS-D). We also independently administered the 26-items Health Related Quality of Life in Stroke Patients (HRQOLISP-26), a stroke-specific measure developed from a large cross-cultural sample. Using standard protocol, we identified 6 psychoemotional-domain items of the HRQOLISP-26 fitting a single dimensional model with phenomenological and conceptual overlap with the depression framework in the 10th revision of the International Classification of Diseases (ICD-10). We examined construct validity by comparing HRQOLISP-E with the HADS-D, and known group validity by comparing with age, gender, and stroke severity using both the Pearson product moment coefficient and multivariate regression analyses. Internal consistency and split-half reliability were also determined.

Results: Each HRQOLISP-E item ($r = -0.40$ to -0.53, all $p < 0.001$), as well as the total HRQOLISP-E score (-0.53, $p < 0.001$) showed significant correlation with the HADS-D. The HRQOLISP-E scores also correlated significantly with age and stroke severity. Depression assessed using the HRQOLIPS-E was independently associated with older age and stroke severity. All HRQOLISP-E items scale correlations were > 0.8 (0.81–0.93) compared with 0.56–0.68 for the HADS-D (Cronbach's alpha = 0.939, versus 0.742 for the HADS-D, Split-half reliability = 0.899, versus 0.739 for HADS-D).

Conclusion: These results provides preliminary support for further development of the HRQOLISP-E as a context-specific screening tool for PSD through an investigation comparing the proposed measure against a referent-standard clinical diagnostic criteria such as the ICD 10 or Diagnostic and Statistical Manual of Fourth Edition of the Diagnostic and Statistical Manual of Mental Disorders.

1. Introduction

Stroke-burden is increasing rapidly [4] due to the rising morbidity and disability [12]. Most of poststroke morbidity is due to depression [9], which though treatable [7], is mostly unidentified and untreated [6]. Consequently, improvement in recognition and access to effective treatment has become a priority, and routine screening for poststroke depression (PSD) is now increasingly recommended [20].

The standard recommendation for a diagnosis of PSD suggests that depression diagnoses should most appropriately be based on a semi-structured mental state examination and clinical criteria such as the Diagnostic and Statistical Manual of Mental Disorders (DSM IV/V) or the 10th Revision of the International Classification of Diseases (ICD 10) for depression due to stroke with major depressive-like episode or depressive features [16]. Currently, it remains very difficult to identify the most appropriate screening tool for PSD out of the wide variety available [3].

The experience of depression may vary across socio-economic and clinical circumstances [5]. As such, it is desirable for assessment tools to reflect the user-context. However, available screening tools for PSD are generic, and originally designed for use in general psychiatric populations [8]. In this way, they lack content validity for stroke.

* Corresponding author at: World Health Organization (WHO) Collaborating Centre for Research and Training in Mental health, Neuroscience, and Substance abuse, Department of Psychiatry, College of Medicine, University of Ibadan, P.M.B 5017 (G.P.O), Ibadan, Nigeria.
E-mail address: drakinjagbemi@yahoo.com (A. Ojagbemi).

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In the two systematic reviews of the psychometric properties of all tools (N = 27) that were used for PSD screening up to February 2014 [3,8], none of the measures identified was sufficient in 'ruling-in' depression in stroke survivors because of many false-positives [8]. Tools meeting psychometric and clinical utility criteria in the reviews [3,8] were either no longer in contemporary use or require specialist training and/or are time consuming to administer. The authors noted that the Hospital Anxiety and Depression rating Scale (HADS) which was psychometrically adequate in the stroke population was limited by the enormous cost of its acquisition. Therefore, the optimal tool for identifying depression after stroke is yet to be identified. Such measure should ideally be easy to interpret and acceptable to both stroke patients and healthcare professionals.

In the present study we propose a new context-specific screening tool for PSD, the 'HRQOLISP-E', which is empirically designed from the 26-items version of the Health Related Quality of Life in Stroke patients (HRQOLISP-26) [10]. The HRQOLISP-26 is a stroke-specific measure developed from a large cross-cultural, transnational, patient-controlled sample, and based on a comprehensive model [11]. We aim to examine construct validity and reliability of the HRQOLISP-E within existing data on recent stroke survivors.

2. Methods

2.1. Sites

We evaluated a dataset comprising baseline information collected as part of a ongoing study of an intervention to improve one-year blood pressure control among recent (< 1 month) stroke survivors who were discharged from four hospitals in Nigeria. Ethical approval was obtained from the institutional review boards covering the four hospital sites; the University of Ibadan/University College Hospital joint ethics committees (which cover the World Federation of Neurorehabilitation-Blossom Specialist Medical Center), Federal Medical Center, Abeokuta, and Sacred Heart Hospital. Participants provided written, informed consent before interviews were conducted.

2.2. Subjects

2.2.1. Inclusion criteria

1); age 18 years or older, and 2), recent (≤ one month) survivors of ischaemic or haemorrhagic stroke survivors. The diagnosis of stroke was confirmed based on neuro-imaging and clinical examination criteria [17].

Included patients were informed about the study, and the procedure was explained to them in their home language.

2.2.2. Exclusion criteria

1), patients with severe communication difficulties (N = 34) or aphasia (N = 42); 2) patients with severe cognitive impairments or dementia [(Modified Community Screening Instruments for Dementia (CSID) ≤ 20)]; 3), Modified Rankin Scale (MRS) ≥ 3; and 4), significant comorbid medical illnesses (e.g., chronic kidney disease) [13].

2.3. Measures

Stroke survivors meeting study criteria underwent baseline assessments within the first month of stroke.

PSD was ascertained using the Depression subscale of the Hospital Anxiety and Depression Scale (HADS-D) [22]. The HADS is one of the most widely used screening tool for PSD, and as reported in a recent systematic review of all such instruments [3], it is one of two tools with superior psychometric properties and clinical utility indices in stroke populations. As such, it could be considered a useful referent tool for the development. It includes a total of 14 items each with a score of between 0 and 3. One half of the items are related to anxiety while the other half is specific for depression. The developers of the scale recommend a cut off ≥ 8 for the ascertainment of depression in clinical settings. The HADS has been previously validated in Nigeria [2] where the HADS-D was found to have a sensitivity ranging 89.5–92.1% and a specificity of 86.6–91.1%. Given the acclaimed properties of the HADS-D, we used depression ascertained using the measure as a referent standard for the purpose of the present study.

The HRQOLISP-26 was also independently administered within 15–20 min of the HADS. The HRQOLISP-26 is a flexible and valid shortened version of the comprehensive HRQOLISP suitable for regular assessment of all domains of health related quality of life. It has been found to demonstrate excellent psychometric properties and is valid for routine use in stroke survivors. The instrument has been tested and validated for use in Ibadan and is applicable multiculturally. The HRQOLISP-26 is comprised of four therapeutically relevant domains: Physical, psycho-emotional, cognitive, and eco-social. Apart from the cognitive domain with 5 items, the other domains are composed of 7 items. The items in the psycho-emotional domain are designed to assess stroke-specific emotional wellbeing.

2.4. Other data collection

The following information was obtained from all participants using a standardized questionnaire: demographic data, personal history of smoking, alcohol consumption, and physical activities, medical history of hypertension, diabetes, hyperlipidaemia and heart disease, the use of medications for these conditions, and family history. Information on dietary patterns was obtained using the food frequency questionnaire. The severity of stroke was ascertained using the National Institute of Health Stroke Scale and Stroke Levity Scale [14].The average of two blood pressure (B·P) measurements was recorded. Each B·P measurement was obtained using an Omron HEM-907 XL 26 blood pressure monitor and the readings recorded according to standardized protocol provided by the manufacturers. Along with the blood pressure and pulse rates, anthropometric measurements of weight, height, waist and hip circumferences were also undertaking. Records of other relevant risk factors for stroke were also made. This includes fasting blood sugar, lipid profile, electrocardiogram, carotid Doppler and echocardiography.

2.5. Statistical analyses

Descriptive statistics such as means and standard deviations were used to summarize quantitative variables, while frequencies and proportions were used for discrete variables. Stroke survivors with clinical depression where those who had a score ≥ 8 on the HADS-D.

We explored dimensionality of the *Psycho-emotional items of HRQOLISP-26* by examining whether the domain could best serve as a single independent scale. For this, we conducted exploratory factor analysis (EFA) on all 7 items in the *Psycho-emotional domain of HRQOLISP-26*. Factors obtained following initial maximum likelihood exploration were further rotated using the varimax procedure. Factors were recorded when they have eigenvalues greater than unity. For the factor extraction, loadings of ≥ 0.5 were considered meaningful.

We then examined content validity. For this, a consultant psychiatrist independently examined each of the *Psycho-emotional items* and determined whether the scale contained the minimum number of items required for the diagnostic assessment of depression specified in the ICD 10.

Next, we investigated the phenomena of screening positive for depression in the HADS-D versus the empirically-determined *depression scale* (*HRQOLISP-E*). Further exploration of criterion validity was then conducted by examining the correlation of the scores of each items of HRQOLISP-E with the total HADS-D score using the Pearson product moment correlation (r) [15]. The same method was used for the total HRQOLISP-E scores, and for the investigation of additional evidence of construct validity, by examining the correlation of the HRQOLISP-E