

A core outcome set for aphasia treatment research: the ROMA consensus statement

Wallace, Sarah J.; Worrall, Linda; Rose, Tanya; LeDorze, Guylaine; Breitenstein, Caterina; Hilari, Katerina; Babbitt, Edna; Bose, Arpita; Brady, Marian; Cherney, Leora R.; Copland, David; Cruice, Madeline; Enderby, Pamela ; Hersh, Deborah; Howe, Tami; Kelly, Helen; Kiran, Swathi; Laska, Ann-Charlotte ; Marshall, Jane; Nicholas, Marjorie ; Patterson, Janet; Pearl, Gill; Rochon, Elizabeth; Rose, Miranda; Sage, Karen ; Small, Steven; Webster, Janet

Published in:

International Journal of Stroke

DOI:

[10.1177/1747493018806200](https://doi.org/10.1177/1747493018806200)

Publication date:

2019

[Link to publication in ResearchOnline](#)

Citation for published version (Harvard):

Wallace, SJ, Worrall, L, Rose, T, LeDorze, G, Breitenstein, C, Hilari, K, Babbitt, E, Bose, A, Brady, M, Cherney, LR, Copland, D, Cruice, M, Enderby, P, Hersh, D, Howe, T, Kelly, H, Kiran, S, Laska, A-C, Marshall, J, Nicholas, M, Patterson, J, Pearl, G, Rochon, E, Rose, M, Sage, K, Small, S & Webster, J 2019, 'A core outcome set for aphasia treatment research: the ROMA consensus statement', *International Journal of Stroke*, vol. 14, no. 2, pp. 180-185. <https://doi.org/10.1177/1747493018806200>

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

If you believe that this document breaches copyright please view our takedown policy at <https://edshare.gcu.ac.uk/id/eprint/5179> for details of how to contact us.

Supplementary Table 1

ROMA consensus meeting facilitators

<p>Sarah J. Wallace PhD BSpPath(Hons) GradCert Gerontology CPSP Certified Practising Speech Pathologist and Teaching and Research Academic, School of Health and Rehabilitation Sciences, The University of Queensland. <i>Expertise: post-stroke aphasia rehabilitation, core outcome set development, stakeholder perspectives, consensus processes, ICF.</i></p>	<p>Linda Worrall PhD BSpThy FSPA Speech Pathologist, Teaching and Research Academic, School of Health and Rehabilitation Sciences, The University of Queensland, Australia. <i>Expertise: post-stroke aphasia rehabilitation, ICF, aphasia trial design and conduct, consumer perspective, aphasia rehabilitation guideline development.</i></p>	<p>Guylaine Le Dorze Ph.D MSc (A) Teaching and Research Academic, Speech-Language Pathologist, School of Speech-Language Pathology and Audiology, Faculty of Medicine, Université de Montréal. <i>Expertise: post-stroke aphasia rehabilitation, participation, single-subject designs, qualitative methods.</i></p>	<p>Tanya Rose PhD BSpPath(Hons) GradCert Higher Ed CPSP Certified Practising Speech Pathologist and Teaching and Research Academic, School of Health and Rehabilitation Sciences, The University of Queensland. <i>Expertise: Post-stroke aphasia rehabilitation, paediatric and adult language, accessible health information, mixed-methods research.</i></p>
--	---	---	--

ROMA consensus panel

<p>Edna Babbitt PhD CCC-SLP BC-ANCDS Research Speech-Language Pathologist Assistant Research Professor, Department of Physical Medicine and Rehabilitation, Feinberg School of Medicine, Northwestern University, Chicago, USA & Shirley Ryan AbilityLab, Chicago, USA. <i>Expertise: Post-stroke aphasia assessment and rehabilitation.</i></p>	<p>Arpita Bose PhD MSc (Speech and Hearing) BSc (Audiology and Speech Rehabilitation). Speech and Language Therapist, Teaching and Research Academic, School of Psychology and Clinical Language Sciences, University of Reading, Reading, UK. <i>Expertise: Post-stroke aphasia assessment and rehabilitation, bilingualism, single subject experimental designs, quality of life issues in aphasia, SLT training in decision-making in aphasia.</i></p>	<p>Marian Brady PhD BSc Speech and language therapist, Director Stroke Rehabilitation Research, NMAHP Research Unit, Glasgow Caledonian University, Glasgow, Scotland. <i>Expertise: Stroke rehabilitation, design, development and evaluation of complex multidisciplinary interventions, survey, mixed methods, systematic review, meta-analyses and the use of randomised controlled trial archives.</i></p>	<p>Caterina Breitenstein PhD academic degrees in Clinical Psychology and Cognitive Neuroscience. Teaching and Research Academic, Dept. of Neurology, University of Muenster, Germany. <i>Expertise: Development and national adaptations of communication outcome measures, clinical trials methodology, intervention studies in post-stroke aphasia rehabilitation.</i></p>
<p>Leora R. Cherney PhD CCC-SLP BC-ANCDS. Research Scientist and Speech and Language Pathologist. Shirley Ryan AbilityLab (formerly the Rehabilitation Institute of Chicago) and Northwestern University, Chicago, IL USA. <i>Expertise: Post-stroke aphasia</i></p>	<p>David Copland PhD BSpPath (Hons) Speech Pathologist, Principal Research Fellow, School of Health & Rehabilitation Sciences and Centre for Clinical Research, The University of Queensland, Brisbane, Australia.</p>	<p>Madeline Cruice PhD BSpPath (Hons) Registered Speech and Language Therapist, Reader, Teaching and Research Academic, School of Health Sciences, City University of London, London, UK.</p>	<p>Pam Enderby PhD MBE DSc (Hons) MSc FRCSLT Speech and Language Therapist, Professor Emeritus of Community Rehabilitation, University of Sheffield, Sheffield. UK.</p>

<p><i>assessment and rehabilitation, development and evaluation of novel aphasia treatments, single subject and RCT design, systematic reviews.</i></p>	<p><i>Expertise: Post-stroke aphasia assessment and rehabilitation, aphasia trial design and conduct, neuroimaging in aphasia.</i></p>	<p><i>Expertise: Post-stroke aphasia rehabilitation, therapeutic process and evaluation, quality of life evaluation in research and clinical practice, behaviour change.</i></p>	<p><i>Expertise: Aphasia management, Clinical Evaluation of Interventions, RCTs, Psychometric Properties of Outcome Measures.</i></p>
<p>Deborah Hersh PhD MSc BSc(Hons) GradCert Higher Ed FSPA. Speech Pathologist, Teaching and Research Academic, School of Medical and Health Sciences, Edith Cowan University, Perth, Australia. <i>Expertise: Post-stroke aphasia rehabilitation, consumer perspective, aphasia rehabilitation guideline development.</i></p>	<p>Katerina Hilari PhD MRCSLT MHPC Psychologist, Registered Speech and Language Therapist, Teaching and Research Academic, School of Health Sciences, City, University of London, UK. <i>Expertise: Outcome measurement development, validation and cultural adaptation, post-stroke aphasia rehabilitation, feasibility RCTs, clinical guideline development.</i></p>	<p>Tami Howe PhD MHSc BEd SLP(C) Speech Pathologist and Teaching and Research Academic, School of Audiology and Speech Sciences, University of British Columbia, Vancouver, Canada. <i>Expertise: Aphasia rehabilitation, ICF, accessibility, goal setting, social participation, impact of aphasia on family members.</i></p>	<p>Helen Kelly PhD MRCSLT Registered Speech and Language Therapist, Teaching and Research Academic, Department of Speech and Hearing Sciences, University College Cork, Cork, Ireland. <i>Expertise: Post-stroke aphasia assessment and management, single subject and RCT feasibility aphasia trial design and conduct, consumer perspective.</i></p>
<p>Swathi Kiran PhD CCC-SLP Speech Language pathologist, Teaching and Research Academic. Professor, Associate Dean for Research Sargent College of Health and Rehabilitation Sciences, Boston University, Boston, MA, USA. <i>Expertise: Aphasia rehabilitation, neuroimaging, bilingualism, single subject experimental design.</i></p>	<p>Ann-Charlotte Laska MD A/Professor Department of Clinical Science Karolinska Institutet Danderyd Hospital, Sweden <i>Expertise: Post-stroke aphasia, study design and conduct, RCT.</i></p>	<p>Jane Marshall PhD Post Grad Diploma in Clinical Communication Studies BA FRCSLT Registered Speech and Language Therapist, Teaching and Research Academic, School of Health Sciences, City, University of London, UK. <i>Expertise: Post-stroke aphasia rehabilitation, the development and evaluation of novel treatments.</i></p>	<p>Marjorie Nicholas PhD CCC-SLP Professor and Interim Chair Dept. of Communication Sciences and Disorders, MGH Institute of Health Professions, Boston, MA, USA. <i>Expertise: Aphasia rehabilitation, nonverbal cognition in aphasia, Life Participation Approach to Aphasia and community aphasia program design, ICAP design.</i></p>
<p>Janet Patterson PhD CCC-SLP ASHA Fellow Chief, Audiology & Speech-Language Pathology Service, VA Northern California Health Care System Practicing Speech-Language Pathologist, Teaching and Research Academic. <i>Expertise: Post-stroke aphasia</i></p>	<p>Gill Pearl MPhil Dip Hum Commun. Certified practicing speech and language therapist in role as Chief Executive Officer of Speakeasy - specialist aphasia centre, UK. <i>Expertise: Development and evaluation of novel approaches to providing long term aphasia support and therapy, facilitator of consumer involvement in</i></p>	<p>Elizabeth Rochon PhD MSc (A) Reg CASLPO SLP(c) Speech Pathologist, Teaching and Research Academic, Department of Speech-Language Pathology and Rehabilitation Sciences Institute, University of Toronto, Canada. <i>Expertise: Post-stroke aphasia assessment and rehabilitation, development of aphasia treatment</i></p>	<p>Miranda Rose PhD BSpPath FSPA Speech pathologist, Teaching and Research Academic, School of Allied Health, La Trobe University, Victoria, Australia. <i>Expertise: Post-stroke aphasia rehabilitation, aphasia trial design and conduct, single subject designs, consumer perspective, aphasia rehabilitation guideline development.</i></p>

<p><i>rehabilitation, systematic reviews of literature, single subject designs.</i></p>	<p><i>research, feasibility studies, case series studies, RCT design and conduct.</i></p>	<p><i>studies, feasibility studies, single subject and RCT design, systematic reviews.</i></p>	
<p>Karen Sage PhD Dip DisHumComm BA (Hons) HCPC Registered Speech and Language Therapist, MRCSLT; Teaching and Research Academic, Department of Allied Health Professions, Sheffield Hallam University, Sheffield, UK. <i>Expertise: Aphasia assessment and management, stroke rehabilitation, single case, case series, mixed methods.</i></p>	<p>Steven L. Small PhD MD Professor of Neurology, University of California, Irvine <i>Expertise: Neurobiology of Language, Cognitive Neurology.</i></p>	<p>Janet Webster PhD MRCSLT Registered Speech and Language Therapist, Teaching and Research Academic, Newcastle University, UK <i>Expertise: Post-stroke aphasia assessment and management, single subject design.</i></p>	

Supplementary Table 2

OMIs (n=50) identified in scoping review and retained following application of the consensus-based criteria

Construct	Outcome measurement instrument
Language	<ul style="list-style-type: none"> • The Comprehensive Aphasia Test (CAT) (1) • The Western Aphasia Battery Revised (WAB-R) (AQ+LQ) (2) • Therapy Outcome Measures (TOM) (3-5) • The Aphasia Checklist (ACL) (6) • Aachen Aphasia Test (AAT) (7) • Aphasia Language Assessment Test (ALA) (8) • The Thai Aphasia Language Performance Scales (ALPS) (9) • Bilingual Aphasia Test (BAT) (10) • The Boston Diagnostic Aphasia Examination (BDAE) (11) • Ege Aphasia Test (12) • Kentucky Aphasia Test (KAT) (13) • Montreal-Toulouse Language Assessment Battery (MTL) (14) • The Norsk Grunntest for Afasi (NGTA) (15)
Emotional well-being	<ul style="list-style-type: none"> • Communication Confidence Rating Scale for Aphasia (CCRSA) (16) • Hospital Anxiety and Depression Scale (HADS) (17) • Montgomery-Asberg Depression Rating Scale (MADRS) (18) • Geriatric Depression Scale (GDS) 15 item / 30 item (19, 20) • Warwick and Edinburgh mental well-being scale (21) • Geriatric anxiety scale (22) • Stroke and Aphasia (SAD) Scale (23) • Signs of Depression Scale (SODS) (24) • Stroke Aphasic Depression Questionnaire (SADQ) (25) • Visual Analogue Self-Esteem Scale (VASES) (26) • Centre for Epidemiology Depression Scale –Revised (27) • General Health Questionnaire (GHQ) 12 item (28) • Therapy Outcome Measures (TOM) (29-31) • Patient Health Questionnaire 2 item / 9 item (32, 33) • Visual Analogue Mood Scale (VAMS) (34)

<p style="text-align: center;">Communication</p>	<ul style="list-style-type: none"> • Aphasia Communication Outcome Measure (ACOM) (35) • American Speech-Language and Hearing Association Functional Assessment of Communication Skills for Adults (ASHA-FACS) (36) • Amsterdam-Nijmegen Everyday Language Test (ANELT) (37) • The Communication Activity Log (CAL) (38) • The Communication Outcome After Stroke (COAST) (39) • The Communicative Activities Checklist (COMACT) (40) • The Social Activities Checklist (SOCACT) (40) • The Communication Disability Profile (CDP) (41) • The Communication Effectiveness Index (CETI) (42) • Community Integration Questionnaire (CIQ-R) (43) • Communication Activities of Daily Living (CADL) (44) • The Functional Outcome Questionnaire for Aphasia (FOQ-A) (45) • Measure of participation in conversation (MPC) (46) • The Scenario Test (47) • The Speech Questionnaire (48) • Therapy Outcome Measures (TOM) (29-31) • The Communication Participation Item Bank (49)
<p style="text-align: center;">Quality of Life</p>	<ul style="list-style-type: none"> • Aachen Life Quality Inventory (ALQI) (50) • Burden of Stroke Scale (BOSS) (51) • The Newcastle Stroke-Specific Quality of Life Measure (NEWSQOL) (52) • Short Form 36 Health Survey (SF-36) (53) • Stroke and Aphasia Quality of Life Scale (SAQOL-39) (54, 55)

Supplementary Table 3

Description of recommended outcome measurement instruments

Outcome instrument and abbreviation	Development / alternate versions	Aims/instrument description	Number of items	Duration	Scoring system	Training	Cost*/availability	Language translations
Western Aphasia Battery Revised (WAB-R) (2)	<p>Developed by Kertesz in 1979 based on the original format of the Boston Diagnostic Aphasia Examination (56).</p> <p>Revisions published in 1982 and 2006 (WAB-R): Supplemental tasks, revision of 15 items and testing materials (e.g. spiral-bound stimulus book replacing loose stimulus cards), as well as revised directions and scoring guidelines for clarity.</p> <p>The WAB-R also includes a bedside screening tool (Bedside WAB-R).</p>	<p>Primary: Assessment of linguistic skills in aphasia:</p> <ol style="list-style-type: none"> Spontaneous speech Auditory verbal comprehension Repetition Naming and word finding Reading Writing Apraxia Constructional, visuospatial, and calculation tasks Supplemental writing and reading tasks: reading and writing of irregular and non-words (WAB-R only) <p>Secondary: Assessment of non-linguistic skills in aphasia: drawing, block design, calculation, and praxis</p> <ol style="list-style-type: none"> Additional aims: Classification of 8 aphasia types: Global, Broca's, Transcortical motor, Wernicke's, 	>300	<ul style="list-style-type: none"> Bedside WAB-R: 15 min (comprises half of the items of WAB-R Part 1) Part 1: 30-45 min Part 2: 45-60 min 	<ul style="list-style-type: none"> Aphasia Quotient (AQ): a weighted average of the WAB spoken language subtest scores. Cortical Quotient (CQ): a weighted average of both the language and non-language subtest scores. The Language Quotient (LQ): reflects auditory comprehension, oral expression, reading, and writing performance. 	<p>Administration: "some training" required according to developers.</p> <p>Scoring procedures require training.</p>	<p>Testing materials: +++</p> <p>Available from: https://www.pearsonclinical.com</p>	<p>Cantonese (57) Korean (58) Bangla (59) Tagalog (60) Brazilian Portuguese (61) Japanese (62) Hungarian French Turkish (63) Hebrew Spanish (64)</p>

		<p>Transcortical sensory, Mixed transcortical, Conduction, and Anomic</p> <ol style="list-style-type: none"> 2. Assessment of aphasia severity 3. Used to determine the location of the lesion 						
<p>Stroke and Aphasia Quality of Life Scale (SAQOL-39; SAQOL-39g) (54, 55)</p>	<p>The SAQOL-39 is the short form of the SAQOL (53 items), which is itself an adaptation of the SS-QOL (Stroke-specific Quality of life scale).</p> <p>The SAQOL-39 was originally tested in people with chronic aphasia (the measure had four domains: physical, psychosocial communication, energy).</p>	<p>Interview-administered self-report measure, SAQOL-39 comprises 39 questions, in four quality of life (QoL) domains:</p> <ol style="list-style-type: none"> 1. Physical (17 items) 2. Communication (7 items) 3. Psychosocial (11 items) 4. Energy (4 items) <p>SAQOL 39g comprises the same 39 questions, in three quality of life (QoL) domains:</p> <ol style="list-style-type: none"> 1. Physical (16 items) 2. Communication (7 items) 3. Psychosocial (16 items) <p>Timeframe for all questions is the past week</p>	39	<ul style="list-style-type: none"> • 15-20 min (depending on severity of aphasia) 	<ul style="list-style-type: none"> • Twenty-one of the items ask the respondents how much trouble they have had with activities (e.g., getting dressed, speaking). The response format for these questions is a 5-point scale that varies from 1='couldn't do it at all' to 5='no trouble at all'. The rest of the items (18) ask about feelings (e.g., 'did you feel irritable?') and other activities (e.g., 'did you see your friends less often than you would like?'). Their response format 	<p>Administration: Guidance is provided in administration guidelines. Administrators need to have skills in communicating with people with aphasia</p> <p>Scoring procedures: no training required</p>	<p>Free.</p> <p>Available from: https://blog.s.city.ac.uk/cityaccess/saqol-description/</p>	<p>Chilean (68) Chinese (69) Chinese mandarin (70) Dutch (71) Greek (72, 73) Hindi (74) Italian (75) (76) Japanese (77) Kannada (78) Korean (79) Malayalam (80) Persian (81) Portuguese (82) Spanish (83) Turkish (84)</p>

	<p>Testing the SAQOL-39 in generic stroke population (n=87) resulted in the SAQOL-39g, which has the same items as the SAQOL-39 but three domains (all energy items groups with the psychosocial domain).</p> <p>There are alternative forms for proxy administration (65, 66) and for postal and telephone administration (67)</p>	<p>Multi-modal presentation, i.e., patients can both read and listen to the questions. People with expressive aphasia can point to their responses instead of verbally responding.</p>			<p>varies from 1='definitely yes' to 5='definitely no'.</p> <p>Calculation of:</p> <ol style="list-style-type: none"> total score: mean score of all 39 items Domain scores: mean score of all items relating to the respective domain 			
<p>General Health Questionnaire (GHQ) 12</p>	<p>Developed in 1972. Current version published in 2011)</p> <p>Alternate versions:</p> <ul style="list-style-type: none"> GHQ-60: 60-item questionnaire GHQ-30: a short form without items relating to 	<p>Primary: Screening device for identifying minor psychiatric disorders in the general population and within community or non-psychiatric clinical settings such as primary care or general medical out-patients.</p> <p>12 questions relating to symptoms of various psychiatric conditions, assesses the respondent's</p>	12	2 min administration time (in non-language impaired samples)	<p>4-scale response options (exact wording depends on item):</p> <ol style="list-style-type: none"> 'better/healthier than normal' 'same as usual' 'worse/more than usual' 'much worse/more than usual' 	<p>Administration: no training required.</p> <p>Scoring procedures: no training required.</p>	<p>Testing materials: +</p> <p>Available from: https://www.g-l-assessment.co.uk</p>	<p>Italian (85) Arabic (86) Turkish (87) Persian (88) Portuguese (89) Kannada (90) Hindi (91) Spanish (92)</p> <p>A number of other unvalidated translations are available. The MAPI Research</p>

	<p>physical illness</p> <ul style="list-style-type: none"> • GHQ-28: a 28 item scaled version – assesses somatic symptoms, anxiety and insomnia, social dysfunction and severe depression (7 items for each of the four scales) 	<p>current state and asks if that differs from his or her usual state, and is therefore sensitive to short-term psychiatric disorders.</p>			<p>4 possible methods of scoring. GHQ scoring (0-0-1-1) is advocated by the test author.</p> <p>GHQ-12 yields only an overall total score (range: 0 to 12 points with standard scoring procedure).</p>			<p>Trust distributes translated versions on behalf of GL Assessment. Contact: PROinformation@mapi-trust.org</p>
--	--	--	--	--	--	--	--	--

* Free, + Up to US\$100, ++ Up to US\$200, +++ > US\$200

Supplementary Table 4

Properties of recommended outcome measurement instruments

	Western Aphasia Battery – Revised (WAB-R)	Stroke and Aphasia Quality of Life Scale (SAQOL-39/39g)	General Health Questionnaire (GHQ-12)
Objectivity	<ul style="list-style-type: none"> • During assessment: Limited because no audio recordings of verbal stimulus material available • During scoring: Limited for spontaneous speech and written output subtests 	<ul style="list-style-type: none"> • During assessment: Moderate (interaction between assessor and patient frequently required because of physical stroke symptoms (arm paresis) and lack of pictorial task instructions (written sentences only) • During scoring: High 	<ul style="list-style-type: none"> • During assessment: High if assessor does not interact with patient • During scoring: High
Internal consistency	High: Cronbach’s alpha of total score= 0.91 (93).	High: Cronbach’s alpha of total score= 0.93; Cronbach’s alpha of subscale scores= 0.74–0.94 (54). SAQOL-39g: High: Cronbach’s alpha of total score= 0.95; Cronbach’s alpha for subscale scores= 0.92-0.95 (55)	High (in general population): Cronbach’s alpha of total score= 0.79-0.91 (94-96). Cronbach’s alpha of subscale scores= 0.80-0.92.
Test-retest reliability*	Excellent test-retest reliability: $r > 0.90$ Acute stage post stroke: <ul style="list-style-type: none"> • Korean version; (58); 5-day test–retest interval (n=20 people with aphasia; Aphasia Quotient: $r=0.976$; Language Quotient: $r=0.977$; Cortical Quotient: $r=0.920$; Spontaneous Speech: $r=0.96$; Auditory Comprehension: $r=0.967$; Repetition: $r=0.952$; Naming: $r=0.934$; Reading: $r=0.986$; Writing: $r=0.988$; Praxis, $r=0.908$; Construction: $r=0.922$). Chronic stage post stroke: <ul style="list-style-type: none"> • 1 year test–retest interval (97), n=22 patients, $r=0.992$ 	Good to excellent test-retest reliability ICC=0.89-0.98 <ul style="list-style-type: none"> • English version; 2 to 14 days; n=17 people with aphasia; ICC=0.98 overall, 0.94–0.98 subscales (54). • English generic stroke version (SAQOL-39g); 7 ± 4 day test–retest interval; n=18 people with stroke/ stroke and aphasia; ICC= 0.96 overall; ICC= 0.92–0.98 subscales (55) Other translated versions: <ul style="list-style-type: none"> • Chilean version; ICC=0.95 (67) • Chinese ICC=0.97(69) • Chinese mandarin version; ICC=0.98 (70) • Dutch ICC=0.9 (71) • Greek ICC=0.96 (73) 	Acceptable to excellent test-retest reliability <ul style="list-style-type: none"> • General population: ICC=0.79-0.82 (100) • Stroke (inc. aphasia) population using GHQ-28: 2 month test-retest reliability with a sample of 20 individuals ($r=0.90$) (101)

	<ul style="list-style-type: none"> 6 months to 6.5 test–retest interval (av. 12-23 months test–retest interval; (93)), n=38 patients with chronic aphasia; WAB-AQ (r=0.968), WAB-CQ (n=9, r=0.895), WAB-LQ subtests: Spontaneous Speech – Information Content (r=0.947) and Fluency (r=0.941), Comprehension (r=0.881), Repetition (r=0.970), Naming (r=0.923), Reading (n=32; r=0.927) and Writing (n=25; r=0.956) and the Construction subtest (n=14, r=0.974). Test-retest reliability was <u>adequate</u> for the Praxis subtest (n=18, r=0.581). Danish version (98); 3.5 months test–retest interval; n=19, r=0.96. Cantonese version (99); 12 to 16 months test–retest interval; n=16 patients, Spontaneous Speech subtest – Information, Fluency and total scores (r=0.83, 0.94, 0.96 respectively), Naming subtest (r=0.91), AQ (r=0.93). 	<ul style="list-style-type: none"> Hindi ICC=0.9 (74) Italian ICC=0.916 (75) (76) Japanese ICC=0.97 (77) Kannada ICC=0.8 (78) Korean ICC=0.909 (79) Malayalam ICC=0.91 (80) Persian ICC=0.93 (81) Portuguese ICC=0.927 (82) Spanish ICC=0.949 (83) Turkish ICC=0.97 (84) 	
Responsiveness	<p>Sub-/acute phase (up to 1 month post-onset):</p> <ul style="list-style-type: none"> WAB-LQ: n=50 adults with aphasia secondary to acute stroke, who received treatment (n=42) or no treatment (n=8). Participants assessed at baseline (2-4 weeks post-onset of aphasia), 3 months, and at least 6 months post-baseline. Significant main effect for time (F=43.33, df=2.96, p<0.0001), significant differences in the mean scores for the three tests (p<0.01). (102) Very Early Rehabilitation of Speech (VERSE) trial; n=20 participants with mild-severe aphasia receiving intervention (4-5 h/wk for 5 wks) achieved 18% greater recovery on the 	<p>Acute to post-acute phase (up to 6 months post-onset):</p> <ul style="list-style-type: none"> Generic stroke sample, n=87; people admitted to hospital with a first stroke were assessed two weeks, three months and six months post stroke. Moderate changes (d = 0.35—0.49; standardized response mean (SRM) = 0.29—0.53) from two weeks to six months support responsiveness. (55) <p>Post-acute to chronic (3 months to 1 year)</p> <ul style="list-style-type: none"> Cohort study of stroke sample with and without aphasia, n=78. Effect size r=0.22. MID estimated 0.21. (107) <p>Chronic phase (at least 6 months post-onset):</p>	<p>Acute to post-acute phase (up to 6 months post-onset):</p> <ul style="list-style-type: none"> Impact of stroke with and without aphasia across the first six months, n=87 people with stroke or stroke and aphasia; psychological distress significantly reduced with time on GHQ-12 [F (2,140) = 7.1, p=0.001] (109) <p>Chronic phase (at least 6 months post-onset):</p> <ul style="list-style-type: none"> Effects of singing in a community choir on mood; n=13 people with aphasia; 2.8 point reduction in mean GHQ-12 score was seen by week 12,

	<p>WAB-AQ compared to the usual care group (11 min/week for 3 wks) (103).</p> <p>Post-acute phase (2-6 months post-onset):</p> <ul style="list-style-type: none"> • See (102) above • Prospective longitudinal study with n=75 participants with aphasia post stroke, assessments at 4, 8, 12 and 24 weeks post-stroke, significant improvement in WAB-AQ across first year post-stroke (104) <p>Chronic phase (at least 6 months post-onset):</p> <ul style="list-style-type: none"> • n=10 participants with chronic aphasia. Combination of d-amphetamine, TMS, and SLT superior to control intervention of placebo with TMS and SLT; Change in AQ (from 36.13[18.23] to 38.60[19.33], P = 0.04) and LQ (from 32.41[14.93] to 35.03[15.10], P = 0.02) showed a statistically significant increase in the active experiment. Comparison of proportional changes of AQ and LQ in the active experiment with AQ and LQ in the placebo experiment showed a significant difference (AQ, P = 0.02; LQ, P = 0.008) (105) <p>Mixed stages</p> <ul style="list-style-type: none"> • n= 50 participants with aphasia (49 secondary to subacute or chronic stroke). Participants' mean scores improved significantly from pre- to post-treatment on all WAB subtests, with absolute percentages ranging from 6.5% to 13% improvement (p<0.01 to p<0.0001) (106). 	<ul style="list-style-type: none"> • Intensive speech and language therapy compared to a waiting list control condition; n=156; Verbal communication was significantly improved from baseline to post-treatment (mean difference 2.61 points [SD 4.94]; 95% CI 1.49 to 3.72), but not from baseline to after treatment deferral (-0.03 points [4.04]; -0.94 to 0.88; between-group difference Cohen's d=0.58; p=0.0004). F-value for the main comparison is 12.97 (df1=1, df2=153), p= 0.0004 (108) 	<p>suggesting a possible reduction in adverse mood symptoms that was sustained to week 20. (110)</p> <ul style="list-style-type: none"> • Effects of solution-focused brief therapy, n=5 people with aphasia, On GHQ-12 the mean (SD) score before therapy was 4.80 (4.60) [median (IQR) = 6.00 (0-9.00)]. This was reduced after therapy to a mean (SD) score of 2.00 (2.55) [median (IQR) = 1.00 (0-4.50)]. The effect size was large: Cohen's d = 0.79. (111) <p>Caregivers of people with aphasia:</p> <ul style="list-style-type: none"> • Impact of a psychoeducation program on caregivers' burden and stress, n =31 caregivers of people with post stroke aphasia. Caregivers in the immediate treatment group had significant reductions in GHQ-12 measured stress (GHQ mean (SD) at baseline =6.26 (5.67), GHQ post treatment 3.21 (SD 4.20), =/0.006). (112)
Convergent validity	<ul style="list-style-type: none"> • Convergent validity in sample of n=15 people with aphasia (93). Comparison 	<ul style="list-style-type: none"> • SAQOL-39: Good convergent validity (r=0.55 to 0.67)(54). Adequate correlation between 	Convergent validity in post-stroke aphasia sample:

	<p>with corresponding subtests of the Neurosensory Center Comprehensive Examination for Aphasia (NCCEA), using Pearson correlation coefficients</p> <ul style="list-style-type: none"> ○ Excellent correlation between: WAB Spontaneous Speech and NCCEA Description of Use and Sentence Construction ($r=0.817$); WAB Comprehension and NCCEA Identification by Name and Identification by Sentence ($r=0.915$); WAB Repetition and NCCEA Sentence Repetition ($r=0.880$); WAB Naming and NCCEA Visual Naming and Word Fluency ($r=0.904$); WAB Reading and NCCEA Reading subtests ($r=0.919$); WAB Writing and NCCEA Writing subtests ($r=0.905$); and WAB and NCCEA total scores ($r=0.973$). ○ Excellent correlation between the WAB-CQ (minus the Praxis and Construction subtests) and a comparable NCCEA score (minus the Tactile Naming-Right/Left, Articulation, Digit Repetition-Forward/Backward subtests) ($r=0.964$). <ul style="list-style-type: none"> • Sample of $n=45$ people with aphasia. Excellent correlation between the WAB and the Czech version of the Mississippi Aphasia Screening Test (MASTcz) ($r=0.933$) (113) 	<p>GHQ-12 and the SAQOL-39 mean (0.53, $p<0.01$). The physical, communication, and energy subscales show good convergent validity ($r=0.39$ to 0.67, $r=0.55$, $r=0.32$, respectively). The psychosocial subdomain shows adequate convergent ($r=0.28$ to 0.62) validity with only 1 correlation lower than predicted ($r=0.28$ with the SSS). Good correlations with Frenchay Activities Index (FAI) and ASHA Functional Assessment of Communication Skills (ASHA-FACS).</p> <ul style="list-style-type: none"> • SAQOL-39g: Good/excellent convergent validity for overall scale ($r=0.36-0.70$); and subdomains ($r=0.47-0.78$) (55), evidenced by moderate to high correlations with measures of stroke severity (NIHSS), activities of daily living (Barthel Index), extended activities of daily living (Frenchay Activities Index), emotional distress (GHQ-12) and language (Frenchay Aphasia Screening Test). 	<ul style="list-style-type: none"> • Good correlations with SAQOL 39/SAQOL-39 (English, Greek, and Turkish versions). • The GHQ-12 demonstrated good convergent validity in a sample of 83 individuals with chronic stroke and aphasia, by comparison with the SAQOL-39. The study yielded an adequate correlation between the GHQ-12 and the SAQOL-39 mean (0.53, $p<0.01$). Correlations between the GHQ-12 and SAQOL-39 subtests were adequate (physical $r=0.39$, energy $r=0.32$, $p<0.01$) to excellent (psychosocial $r=0.62$, $p<0.01$). (54)
Discriminant validity	<ul style="list-style-type: none"> • Sample of $n=140$ people with aphasia. Comparison of WAB with Raven's 	SAQOL-39: Discriminant validity ($r=0.02-0.27$) (54)	Excellent discriminant validity in Swedish population ($n=556$ patient cases surveyed in specialized psychiatric care outpatient age and $n=556$ sex-matched controls).

	<p>Coloured Progressive Matrices scores Adequate correlation ($r=0.547$).</p> <ul style="list-style-type: none"> Sample of $n=66$ people with chronic aphasia. Discriminant validity of the WAB Aphasia Quotient (WAB-AQ) by comparison with the Scandinavian Stroke Scale (SSS), Barthel Index (BI) and Frenchay Activities Index (FAI). Excellent correlation between the WAB-AQ and the SSS ($r=0.64$), adequate correlations between the WAB-AQ and the BI ($r=0.44$) and the FAI ($r=0.50$). 	<p>SAQOL-39g: Good/excellent discriminant validity for overall scale and subdomains, evidenced by low to moderate correlations with external measures ($r = 0.03-0.40$). (55)</p>	<p>Individuals using specialized psychiatric services and healthy controls (Likert index AUC=0.86, GHQ index AUC=0.83), and between individuals with current disorder from healthy controls (Likert index AUC=0.90, GHQ index AUC=0.88). (114).</p>
--	---	--	---

* **Test-retest reliability:** 1=perfect reliability; ≥ 0.9 =excellent reliability; $\geq 0.8 < 0.9$ =good reliability; $\geq 0.7 < 0.8$ =acceptable reliability; $\geq 0.6 < 0.7$ =questionable reliability; $\geq 0.5 < 0.6$ =poor reliability; < 0.5 =unacceptable reliability; 0=no reliability.

References

1. Swinburn K, Porter G, Howard D. Comprehensive Aphasia Test. Hove: Psychology Press; 2004.
2. Kertesz A, Raven JC. The Western Aphasia Battery Revised (WAB-R). San Antonio, TX: PsychCorp; 2007.
3. Enderby P, John A. Therapy Outcome Measures (TOM): Speech and Language Therapy. San Diego, CA: Singular Pub. Group; 1997.
4. Enderby P, John A, Petheram B. Therapy outcome measures for the rehabilitation professionals: Speech and language therapy, physiotherapy, occupational therapy, rehabilitation nursing, hearing therapists 2nd ed. Chichester, West Sussex, England: John Wiley; 2006.
5. Enderby P, John P. Therapy Outcome Measures for Rehabilitation Professionals. 3rd edition. UK: J&R Press; 2015.
6. Kalbe E, Reinhold N, Ender U, Kessler J. Die Aphasia-Check-List (ACL). Köln: Prolog; 2002.
7. Huber W, Poeck K, Weniger D, Willmes K. Der Aachener Aphasie Test (AAT) [Aachener Aphasia Test (AAT)]. Göttingen: Hogrefe 1983.
8. Toğram B, Maviş İ. Validity, Reliability and Standardization Study of the Language Assessment Test for Aphasia. Türk Nöroloji Dergisi. 2012;18(3):96-103.
9. Manochiopinig S, Reed VA, Sheard C, Choo P. An aphasia screening assessment instrument for Thailand: Development and validation. Asia Pacific Journal of Speech, Language, and Hearing. 1996;1(1):21-41.
10. Paradis M, Libben G. The Assessment of Bilingual Aphasia. Hillsdale, N.J.: Lawrence Erlbaum Associates; 1987.

11. Goodglass H, Kaplan E, Barresi B. Boston Diagnostic Aphasia Examination. BDAE. 3rd ed. Philadelphia: Lippincott Williams & Wilkins; 2001.
12. Calis FA, On AY, Durmaz B. Validity and reliability of a new test for Turkish-speaking aphasic patients: Ege Aphasia Test. *NeuroRehabilitation*. 2013;32(1):157-63 7p.
13. Marshall RC, Wright HH. Developing a clinician-friendly aphasia test. *American Journal of Speech-Language Pathology*. 2007;16(4):295-315.
14. Nespoulous JL, Joanne Y, Lecours AR. Protocole Montréal–Toulouse d'examen linguistique de l'aphasie (mt-86). Isbergues: Ortho Edition; 1986.
15. Reinvang I, Engvik H. Norsk Grunntest for Afasi. Oslo: Universitetsforl.; 1980.
16. Cherney L, Babbitt E, Semik P, Heinemann A. Psychometric properties of the communication confidence rating scale for aphasia (CCRSA): Phase 1. *Topics in Stroke Rehabilitation*. 2011;18(4):352-60.
17. Zigmond AS, Snaith RP. The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavica*. 1983;67(6):361-70.
18. Montgomery SA, Åsberg M. A new depression scale designed to be sensitive to change. *The British Journal of Psychiatry*. 1979(134):382-9.
19. Yesavage JA, Brink TL, Rose TL, Lum O, Huang V, Adey M, et al. Development and validation of a geriatric depression screening scale: a preliminary report. *Journal of psychiatric research*. 1982;17(1):37-49.
20. Yesavage JA, Sheikh JI. 9/Geriatric Depression Scale (GDS). *Clinical Gerontologist*. 1986;5(1-2):165-73.
21. Tennant R, Hiller L, Fishwick R, Platt S, Joseph S, Weich S, et al. The Warwick-Edinburgh Mental Well-being Scale (WEMWBS): development and UK validation. *Health and Quality of Life Outcomes*. 2007;5(1):63.

22. Segal DL, June A, Payne M, Coolidge FL, Yochim B. Development and initial validation of a self-report assessment tool for anxiety among older adults: the Geriatric Anxiety Scale. *Journal of anxiety disorders*. 2010;24(7):709-14.
23. Smollan T, Penn C. The measurement of emotional reaction and depression in a South African stroke population. *Disability and rehabilitation*. 1997;19(2):56-63.
24. Hammond MF, O'Keeffe ST, Barer DH. Development and validation of a brief observer-rated screening scale for depression in elderly medical patients. *Age Ageing*. 2000;29(6):511-5.
25. Sutcliffe LM, Lincoln NB. The assessment of depression in aphasic stroke patients: the development of the Stroke Aphasic Depression Questionnaire. *Clinical Rehabilitation*. 1998;12(6):506-13.
26. Brumfitt SM, Sheeran P. The development and validation of the Visual Analogue Self-Esteem Scale (VASES). *Br J Clin Psychol*. 1999;38 (Pt 4):387-400.
27. Eaton WW, Muntaner C, Smith C, Tien A, Ybarra M. Center for Epidemiologic Studies Depression Scale: Review and revision (CESD and CESD-R). *The Use of Psychological Testing for Treatment Planning and Outcomes Assessment Mahwah, NJ: Lawrence Erlbaum; 2004. p. 363-77.*
28. Goldberg D. *General Health Questionnaire (GHQ-12)*. Windsor, UK: NFER-Nelson.; 1992.
29. Enderby P, John A. *Therapy Outcome Measures for Rehabilitation Professionals*. J&R Press; 2015.
30. Enderby P, John A. *Therapy outcome measures (TOM) : speech and language therapy*. John A, editor. San Diego, California.: Singular Pub. Group; 1997.
31. Enderby P, John A, Petheram B. *Therapy Outcome Measures for the rehabilitation professionals: Speech and language therapy, physiotherapy, occupational therapy,*

rehabilitation nursing, hearing therapists. 2nd ed.. ed. Chichester, England.: John Wiley; 2006.

32. Kroenke K, Spitzer RL, Williams JBW. The Patient Health Questionnaire-2: Validity of a Two-Item Depression Screener. *Medical Care*. 2003;41(11):1284-92.

33. Cameron IM, Crawford JR, Lawton K, Reid IC. Psychometric comparison of PHQ-9 and HADS for measuring depression severity in primary care. *The British journal of general practice : the journal of the Royal College of General Practitioners*. 2008;58(546):32-6.

34. Stern RA. Visual Analog Mood Scales professional manual. Odessa, FL: Psychological Assessment Resources; 1997.

35. Doyle Patrick J, Hula William D, Austermann Hula Shannon N, Stone Clement A, Wambaugh Julie L, Ross Katherine B, et al. Self- and surrogate-reported communication functioning in aphasia. *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care & Rehabilitation*. 2013;22(5):957-67.

36. Frattali CM, Thompson CK, Holland AL, Wohl CB, Ferketic MM, . Functional assessment of communication skills for adults. Rockville, MD: American Speech, Language, and Hearing Association.; 1995.

37. Blomert L, Kean ML, Koster C, Schokker J. Amsterdam-Nijmegen Everyday Language Test: Construction, Reliability and Validity. *Aphasiology*. 1994;8(4):381-407.

38. Pulvermüller F, Berthier ML. Aphasia therapy on a neuroscience basis. *Aphasiology*. 2008;22(6):563-99.

39. Long A, Hesketh A, Paszek G, Booth M, Bowen A. Development of a reliable self-report outcome measure for pragmatic trials of communication therapy following stroke: the Communication Outcome after Stroke (COAST) scale. *Clin Rehabil*. 2008;22(12):1083-94.

40. Aujla S, Botting N, Worrall L, Hickson L, Cruice M. Preliminary psychometric analyses of two assessment measures quantifying communicative and social activities: the COMACT and SOCACT. *Aphasiology*. 2015;1-24.
41. Chue WL, Rose ML, Swinburn K. The reliability of the Communication Disability Profile: A patient-reported outcome measure for aphasia. *Aphasiology*. 2010;24(6-8):940-56.
42. Lomas J, Pickard L, Bester S, Elbard H, Finlayson A, Zoghaib C. The Communicative Effectiveness Index: Development and psychometric evaluation of a functional communication measure for adult aphasia. *J Speech Hear Disord*. 1989;54(1):113-24.
43. Callaway L, Winkler D, Tippett A, Migliorini C, Herd N, Willer B. The Community Integration Questionnaire-Revised (CIQ-R). . Melbourne, Australia: Summer Foundation Ltd; 2014.
44. Holland AL, Frattali C, Fromm D. CADL-2 communication activities of daily living Audrey Holland, Carol Frattali, Davida Fromm. CADL-two communication activities of daily living. 2nd ed.. ed. Austin, Tex.: Austin, Tex. : Pro-ed; 1999.
45. Glueckauf RL, Blonder LX, Ecklund-Johnson E, Maher L, Crosson B, Gonzalez-Rothi L. Functional Outcome Questionnaire for Aphasia: Overview and preliminary psychometric evaluation. *Neurorehabilitation*. 2003;18(4):281-90.
46. Kagan A, Winckel J, Black S, Duchan JF, SimmonsMackie N, Square P, et al. A Set of Observational Measures for Rating Support and Participation in Conversation Between Adults with Aphasia and Their Conversation Partners. *Topics in Stroke Rehabilitation*. 2004;11(1):67-83.
47. Van Der Meulen I, Van De Sandt-Koenderman WME, Duivenvoorden HJ, Ribbers GM. Measuring verbal and non- verbal communication in aphasia: reliability, validity, and

sensitivity to change of the Scenario Test. *International Journal of Language & Communication Disorders*, 2010, Vol45(4), p424-435. 2010;45(4):424-35.

48. Lincoln NB. The speech questionnaire: An assessment of functional language ability. *International Rehabilitation Medicine*. 1982;4(3):114-7.

49. Baylor C, Yorkston K, Eadie T, Kim J, Chung H, Amtmann D. The Communicative Participation Item Bank (CPIB): Item Bank Calibration and Development of a Disorder- Generic Short Form. *Journal of Speech, Language, and Hearing Research*. 2013;56(4):1190-208.

50. Hutter BO. Sickness Impact Profile (SIP)-German version. 2001. In: *Compendium of quality of life instruments* [Internet]. Chichester, U.K.: John Wiley & Sons.

51. Doyle PJ, McNeil MR, Mikolic JM, Prieto L, Hula WD, Lustig AP, et al. The Burden of Stroke Scale (BOSS) provides valid and reliable score estimates of functioning and well-being in stroke survivors with and without communication disorders. *J Clin Epidemiol*. 2004;57(10):997-1007.

52. Buck D, Jacoby A, Massey A, Steen N, Sharma A, Ford GA. Development and validation of NEWSQOL, the Newcastle Stroke-Specific Quality of Life Measure. *Cerebrovascular Diseases*. 2004;17(2-3):143-52.

53. Ware JE, Sherbourne CD. The MOS 36-Item Short-Form Health Survey (SF-36): I. Conceptual Framework and Item Selection. *Medical Care*. 1992;30(6):473-83.

54. Hilari K, Byng S, Lamping DL, Smith SC. Stroke and Aphasia Quality of Life Scale-39 (SAQOL-39): evaluation of acceptability, reliability, and validity. *Stroke; a journal of cerebral circulation*. 2003;34(8):1944-50.

55. Hilari K, Lamping DL, Smith SC, Northcott S, Lamb A, Marshall J. Psychometric properties of the Stroke and Aphasia Quality of Life Scale (SAQOL-39) in a generic stroke population. *Clin Rehabil*. 2009;23(6):544-57.

56. Goodglass H, Kaplan E. Boston Diagnostic Aphasia Examination. Philadelphia: Lea and Febiger; 1972.
57. Yiu EML. Linguistic assessment of Chinese-speaking aphasics: Development of a Cantonese aphasia battery. *Journal of Neurolinguistics*. 1992;7(4):379-424.
58. Kim H, Na DL. Normative data on the Korean version of the Western Aphasia Battery. *Journal of clinical and experimental neuropsychology*. 2004;26(8):1011-20.
59. Keshree NK, Kumar S, Basu S, Chakrabarty M, Kishore T. Adaptation of The Western Aphasia Battery in Bangla. 2013;17(2):189.
60. Ozaeta C, Kong A, Ranoa-Javier MB. A Pilot Study of Using the Tagalog Version of the Western Aphasia Battery-Revised in the Philippines. *Procedia - Social and Behavioral Sciences*. 2013;94:232-3.
61. Neves MB, Van Borsel J, Pereira MM, Paradela EM. Cross-cultural adaptation of the Western Aphasia Battery - Revised screening test to Brazilian Portuguese: a preliminary study. *CoDAS*. 2014;26(1):38-45.
62. WAB Aphasia Test Construction Committee. The Japanese version of the Western Aphasia Battery. Tokyo: Igaku-Shoin Ltd.; 1986.
63. Keklikoglu HD, Selcuki D, Keskin S. Should the Western Aphasia Battery be translated into Turkish?/Western Afazi Bataryasi Turkce'ye cevrilmeli mi?(Research Article/Arastirma Makalesi)(Report). 2010;47(1):40.
64. Kertesz A, Pascual-Leone P, Pascual-Leone G. Western Aphasia Battery en versión y adaptación castellana. . Valencia: Nau Libres; 1990.
65. Hilari K, Owen S, Farrelly SJ. Proxy and self-report agreement on the Stroke and Aphasia Quality of Life Scale-39. *Journal of neurology, neurosurgery, and psychiatry*. 2007;78(10):1072-5.

66. Ignatiou M, Christaki V, Chelas EN, Efstratiadou EA, Hilari K. Agreement between People with Aphasia and Their Proxies on Health-Related Quality of Life after Stroke, Using the Greek SAQOL-39g. *Psychology*. 2012;Vol.03No.09:5.
67. Caute A, Northcott S, Clarkson L, Pring T, Hilari K. Does mode of administration affect health-related quality-of-life outcomes after stroke? *International journal of speech-language pathology*. 2012;14(4):329-37.
68. Diaz V, Gonzalez R, Salgado D, Perez D. Stroke and aphasia quality of life scale (SAQOL-39). Evaluation of acceptability, reliability and validity of Chilean version. *Journal of the Neurological Sciences*. 2013;333, Supplement 1:e553-e4.
69. Lin R, Chen X, Feng MI, Cai LJ, Deng F. Reliability and validity of the Chinese-version Stroke and Aphasia Quality of Life Scale. . *Chinese Journal of Nursing*. 2013;4.
70. Guo YE, Togher L, Power E, Koh GC. Validation of the Stroke and Aphasia Quality of Life Scale in a multicultural population. *Disability and rehabilitation*. 2016;38(26):2584-92.
71. van Ewijk L, Versteegde L, Raven-Takken E, Hilari K. Measuring quality of life in Dutch people with aphasia: development and psychometric evaluation of the SAQOL-39NL. *Aphasiology*. 2016:1-12.
72. Kartsona A, Hilari K. Quality of life in aphasia: Greek adaptation of the stroke and aphasia quality of life scale - 39 item (SAQOL-39). *Europa Medicophysica*. 2007;43(1):27-35.
73. Efstratiadou EA, Chelas EN, Ignatiou M, Christaki V, Papathanasiou I, Hilari K. Quality of life after stroke: evaluation of the Greek SAQOL-39g. *Folia phoniatrica et logopaedica : official organ of the International Association of Logopedics and Phoniatries*. 2012;64(4):179-86.

74. Mitra I, Krishnan G. Adaptation and validation of stroke-aphasia quality of life (SAQOL-39) scale to Hindi. *Annals of Indian Academy of Neurology*. 2015;18(1):29-32.
75. Posteraro L, Formis A, Bidini C, Grassi E, Curti M, Bigli M, et al. Aphasia quality of life: reliability of the Italian version of SAQOL-39. *Europa Medicophysica*. 2004;40(4):257-62.
76. Posteraro L, Formis A, Grassi E, Bigli M, Nati P, Proietti Bocchini C, et al. Quality of life and aphasia. Multicentric standardization of a questionnaire. *Europa Medicophysica*. 2006;42(3):227-30 4p.
77. Kamiya A, Kamiya K, Tatsumi H, Suzuki M, Horiguchi S. Japanese Adaptation of the Stroke and Aphasia Quality of Life Scale-39 (SAQOL-39): Comparative Study among Different Types of Aphasia. *Journal of Stroke and Cerebrovascular Diseases*. 2015;24(11):2561-4.
78. Kiran S, Krishnan G. Stroke and aphasia quality of life scale in Kannada-evaluation of reliability, validity and internal consistency. *Annals of Indian Academy of Neurology*. 2013;16(3):361-4.
79. Gimsujeong S, Gimdeokyong G. A measure of quality of life after stroke aphasia (SAQOL-39). Validity and Reliability of the Korean Version. . *Rehabilitation and Welfare*. 2012;16:245–65.
80. Raju R, Krishnan G. Adaptation and validation of stroke-aphasia quality of life (SAQOL-39) scale to Malayalam. *Annals of Indian Academy of Neurology*. 2015;18(4):441.
81. Mazdeh M, Yaghobi A. The Study of Quality of Life in Aphasic Stroke Patients in University- Medical Centers of Hamedan. *Qom Univ Med Sci J*. 2009;3(1):21-8.
82. Rodrigues IT, Leal MG. Tradução portuguesa e análise de aspectos psicométricos da escala "Stroke and Aphasia Quality of Life Scale-39 (SAQOL-39)". *Audiology - Communication Research*. 2013;18:339-44.

83. Lata-Caneda MC, Pineiro-Temprano M, Garcia F, Garcia-Armesto I, Barrueco-Egido JR, Meijide-Failde R. Spanish adaptation of the stroke and aphasia quality of life scale-39 (SAQOL-39). *European Journal of Physical and Rehabilitation Medicine*. 2009;45(3):379-84.
84. Atamaz Calis F, Celik S, Demir O, Aykanat D, Yagiz On A. The psychometric properties of the Turkish Stroke and Aphasia Quality Of Life Scale-39. *International Journal of Rehabilitation Research*. 2016;39(2):140-4.
85. Politi PL, Piccinelli M, Wilkinson G. Reliability, validity and factor structure of the 12-item General Health Questionnaire among young males in Italy. *Acta psychiatrica Scandinavica*. 1994;90(6):432-7.
86. Daradkeh TK, Ghubash R, el-Rufaie OE. Reliability, validity, and factor structure of the Arabic version of the 12-item General Health Questionnaire. *Psychological reports*. 2001;89(1):85-94.
87. Kihç C, Rezaki M, Rezaki B, Kaplan I, Özgen G, Sagduyu A, et al. General Health Questionnaire (GHQ12 & GHQ28): psychometric properties and factor structure of the scales in a Turkish primary care sample. *Social Psychiatry and Psychiatric Epidemiology*. 1997;32(6):327-31.
88. Montazeri A, Harirchi AM, Shariati M, Garmaroudi G, Ebadi M, Fateh A. The 12-item General Health Questionnaire (GHQ-12): translation and validation study of the Iranian version. *Health and quality of life outcomes*. 2003;1:66-.
89. Laranjeira CA. General health questionnaire--12 items: adaptation study to the Portuguese population. *Epidemiologia e psichiatria sociale*. 2008;17(2):148-51.
90. Javaregowda DC, Parthasarathy B, Suresh A, Lokanath D, Govind Babu K, Ullas B, et al. Validation of 12-item general health questionnaire into Kannada language. *Journal of Clinical Oncology*. 2007;25(18_suppl):17077-.

91. Jacob KS, Bhugra D, Mann AH. The validation of the 12-item General Health Questionnaire among ethnic Indian women living in the United Kingdom. *Psychol Med.* 1997;27(5):1215-7.
92. Sanchez-Lopez Mdel P, Dresch V. The 12-Item General Health Questionnaire (GHQ-12): reliability, external validity and factor structure in the Spanish population. *Psicothema.* 2008;20(4):839-43.
93. Shewan CM, Kertesz A. Reliability and validity characteristics of the Western Aphasia Battery (WAB). *J Speech Hear Disord.* 1980;45(3):308-24.
94. Hankins M. The reliability of the twelve-item general health questionnaire (GHQ-12) under realistic assumptions. *BMC public health.* 2008;8(1):355.
95. Gnambis T, Staufenbiel T. The structure of the General Health Questionnaire (GHQ-12): two meta-analytic factor analyses. *Health Psychology Review.* 2018;12(2):179-94.
96. Shevlin M, Adamson G. Alternative Factor Models and Factorial Invariance of the GHQ-12: A Large Sample Analysis Using Confirmatory Factor Analysis. *Psychological Assessment.* 2005;17(2):231-6.
97. Kertesz A, McCabe P. Recovery patterns and prognosis in aphasia. *Brain.* 1977;100 Pt 1:1-18.
98. Pedersen PM, Vinter K, Olsen TS. The Communicative Effectiveness Index: Psychometric properties of a Danish adaptation. *Aphasiology.* 2001;15(8):787-802.
99. Kong AP. The main concept analysis in cantonese aphasic oral discourse: external validation and monitoring chronic aphasia. *Journal of speech, language, and hearing research : JSLHR.* 2011;54(1):148-59.
100. Piccinelli M, Bisoffi G, Bon MG, Cunico L, Tansella M. Validity and test-retest reliability of the Italian version of the 12-item General Health Questionnaire in general

practice: a comparison between three scoring methods. *Comprehensive psychiatry*.

1993;34(3):198-205.

101. Robinson RG, Price TR. Post-stroke depressive disorders: a follow-up study of 103 patients. *Stroke; a journal of cerebral circulation*. 1982;13(5):635.

102. Shewan CM. The Language Quotient (LQ): A new measure for the Western Aphasia Battery. *Journal of communication disorders*. 1986;19(6):427-9.

103. Godecke E, Ciccone NA, Granger AS, Rai T, West D, Cream A, et al. A comparison of aphasia therapy outcomes before and after a Very Early Rehabilitation programme following stroke. *International journal of language & communication disorders / Royal College of Speech & Language Therapists*. 2014;49(2):149-61.

104. Bakheit AMO, Shaw S, Barrett L, Wood J, Carrington S, Griffiths S, et al. A prospective, randomized, parallel group, controlled study of the effect of intensity of speech and language therapy on early recovery from poststroke aphasia. *Clinical Rehabilitation*. 2007;21(10):885-94.

105. Keser Z, Dehgan MW, Shadravan S, Yozbatiran N, Maher LM, Francisco GE. Combined Dextroamphetamine and Transcranial Direct Current Stimulation in Poststroke Aphasia. *American Journal of Physical Medicine & Rehabilitation*. 2017;96(10):S141-S5.

106. Aftonomos LB, Steele RD, Appelbaum JS, Harris VM. Relationships between impairment-level assessments and functional-level assessments in aphasia: Findings from LCC treatment programmes. *Aphasiology*. 2001;15(10-11):951-64.

107. Guo YE, Togher L, Power E, Heard R, Luo N, Yap P, et al. Sensitivity to change and responsiveness of the Stroke and Aphasia Quality-of-Life Scale (SAQOL) in a Singapore stroke population. *Aphasiology*. 2017;31(4):427-46.

108. Breitenstein C, Grewe T, Flöel A, Ziegler W, Springer L, Martus P, et al. Intensive speech and language therapy in patients with chronic aphasia after stroke: a randomised,

open-label, blinded-endpoint, controlled trial in a health-care setting. *The Lancet*.

2017;389(10078):1528-38.

109. Hilari K. The impact of stroke: are people with aphasia different to those without?

Disability and rehabilitation. 2011;33(3):211-8.

110. Tamplin J, Baker FA, Jones B, Way A, Lee S. 'Stroke a Chord': the effect of singing

in a community choir on mood and social engagement for people living with aphasia

following a stroke. *NeuroRehabilitation*. 2013;32(4):929-41.

111. Northcott S, Burns K, Simpson A, Hilari K. 'Living with Aphasia the Best Way I

Can': A Feasibility Study Exploring Solution-Focused Brief Therapy for People with

Aphasia. *Folia phoniatrica et logopaedica : official organ of the International Association of*

Logopedics and Phoniatics. 2015;67(3):156-67.

112. Draper B, Bowring G, Thompson C, Van Heyst J, Conroy P, Thompson J. Stress in

caregivers of aphasic stroke patients: a randomized controlled trial. *Clin Rehabil*.

2007;21(2):122-30.

113. Košťálová M, Bártková E, Šajgalíková K, Dolenská A, Dušek L, Bednařík J. A

standardization study of the Czech version of the Mississippi Aphasia Screening Test

(MASTcz) in stroke patients and control subjects. *Brain Injury*. 2008;22(10):793-801.

114. Lundin A, Ahs J, Asbring N, Kosidou K, Dal H, Tinghog P, et al. Discriminant validity

of the 12-item version of the general health questionnaire in a Swedish case-control study.

Nordic journal of psychiatry. 2017;71(3):171-9.