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**Aphasia outcome measurement in clinical practice: An international survey**

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## **Abstract**

**Background:** Outcome measurement is recommended in stroke clinical practice guidelines, however there is considerable variability in how this activity is performed in clinical practice. Factors driving clinician behaviour have been explored in English-speaking countries, but little is known about the factors influencing clinical practice in non-English-speaking populations.

**Aims:** (1) To explore barriers and facilitators to aphasia outcome measurement from the perspective of international aphasia clinicians. (2) To determine whether barriers and facilitators to outcome measurement differ in English- and non-English- speaking countries. The primary hypothesis was that clinicians working with people with aphasia in non-English-speaking countries would experience more barriers to outcome measurement than those in English-speaking countries.

**Methods and Procedures:** An international sample of aphasia clinicians completed an online survey informed by the Theoretical Domains Framework. Quantitative data were analysed using descriptive statistics and a Mann-Whitney U Test to compare English- and non-English-speaking groups. TDF domains identified as influencing clinician behaviour were mapped to the Behaviour Change Wheel, producing theory-informed strategies to improve practice.

**Outcomes and Results:** A total of 208 clinicians from 25 countries completed the survey. Almost all (93.7%) reported measuring outcomes to some extent, most commonly to measure client progress. Facilitators to outcome measurement included “social/professional role and

identity” (understanding that measuring outcomes is part of the clinicians’ role), “optimism” (feeling positive about measuring outcomes), and “emotion” (enjoying, and feeling comfortable measuring outcomes). Barriers were “environmental context and resources” (time and resource limitations, and competing caseload priorities), “behavioural regulation” (a lack of personal and workplace systems to measure outcomes) and “skills” (having insufficient training and experience in outcome measurement). There was no significant difference between the barriers and facilitators experienced by clinicians in English- and non-English-speaking countries. Implementation strategies, informed by Behaviour Change Techniques, were created to improve clinical practice.

**Conclusions:** Internationally, clinicians working with people with aphasia measure outcomes and believe that this is part of their role, and a positive aspect of their work. Common barriers to outcome measurement included insufficient time and access to resources, inadequate personal and workplace systems, and insufficient skills necessary for performing outcome measurement. Preliminary, theory-informed strategies (e.g., improving access to culturally and linguistically appropriate measurement instruments; developing protocols, templates or checklists guided by recommended practice; and providing training in outcome measurement) would assist with uptake of clinical practice guidelines in this area.

**Keywords:** outcome measures; international; aphasia; barriers and facilitators; theoretical domains framework

## **Introduction**

Outcome measurement is a practice recommended in stroke clinical practice guidelines. People with aphasia should receive a formal, comprehensive assessment by a specialist clinician to determine the nature and type of their communication impairment, as well as the impact of aphasia on functional activities, participation, and quality of life (Stroke Foundation, 2022; Royal College of Physicians, 2016). Change in response to treatment should also be measured, and goals should have measurable outcomes and be reassessed at appropriate intervals over time (Stroke Foundation, 2022). Clinicians use outcome data to measure progress and focus their intervention (Arnold et al., 2020). For many stroke survivors, aphasia is a chronic condition and outcome data can also serve a crucial role in justifying ongoing access to treatment. This imperative is illustrated by the clinical practice guideline recommendation that therapy should continue for as long as a stroke survivor shows “measurable benefit from treatment” (Royal College of Physicians, 2016, p. xiv). While clinical practice guidelines emphasise the importance of measuring outcomes, there remains great variability in how this practice is operationalised in clinical settings. Addressing this variability is challenging due to limited understanding of the factors that drive clinician practice (Arnold et al., 2020; Simmons-Mackie et al., 2005; Tierney-Hendricks et al., 2022).

Studies investigating aphasia outcome measurement practice reveal considerable variability (Arnold et al., 2020; Kiran et al., 2018; Simmons-Mackie et al., 2005; Tierney-Hendricks et al., 2022). Most recently, Tierney-Hendricks and colleagues (2022) used a cross-sectional survey to explore the outcome measurement and treatment practices of speech-language pathologists who work with people with aphasia in the United States. The authors used Living With Aphasia: Framework for Outcome Measurement (A-FROM; Kagan et al., 2008) to understand practice across health care settings (acute, subacute, outpatient and university clinic). In this study, language and functional communication were the most

consistently measured outcome domains for people with aphasia. While language was consistently measured across acute, subacute, outpatient and university settings; functional communication assessment increased in frequency as people with aphasia transitioned to community settings. Consistent with previous surveys of outcome measurement practice, psychological outcomes and caregiver needs were rarely measured in any setting. While this study used an implementation science framework to contextualise clinical practices within the service provision setting, factors driving clinician choices and behaviours were not directly investigated.

Few studies have examined the factors driving clinician practice using a theoretical behaviour change framework. Arnold and colleagues (2020) used the Theoretical Domains Framework (TDF) to identify barriers and facilitators perceived and experienced by 74 Australian speech-language pathologists. The findings revealed several key barriers including poor workplace systems and strategies to support outcome measurement, inadequate clinician skills and knowledge in outcome measurement, limited incentives within the workplace for measuring outcomes, and insufficient time and resources. Whilst this study provides insights into the factors influencing outcome measurement practice, it was limited to a single country where English is the predominant language. Given the known paucity of standardised assessment tools in languages other than English (Fyndanis et al., 2017; Ivanova & Hallowell, 2013), it can be hypothesised that different barriers and facilitators to outcome measurement may exist in non-English-speaking populations.

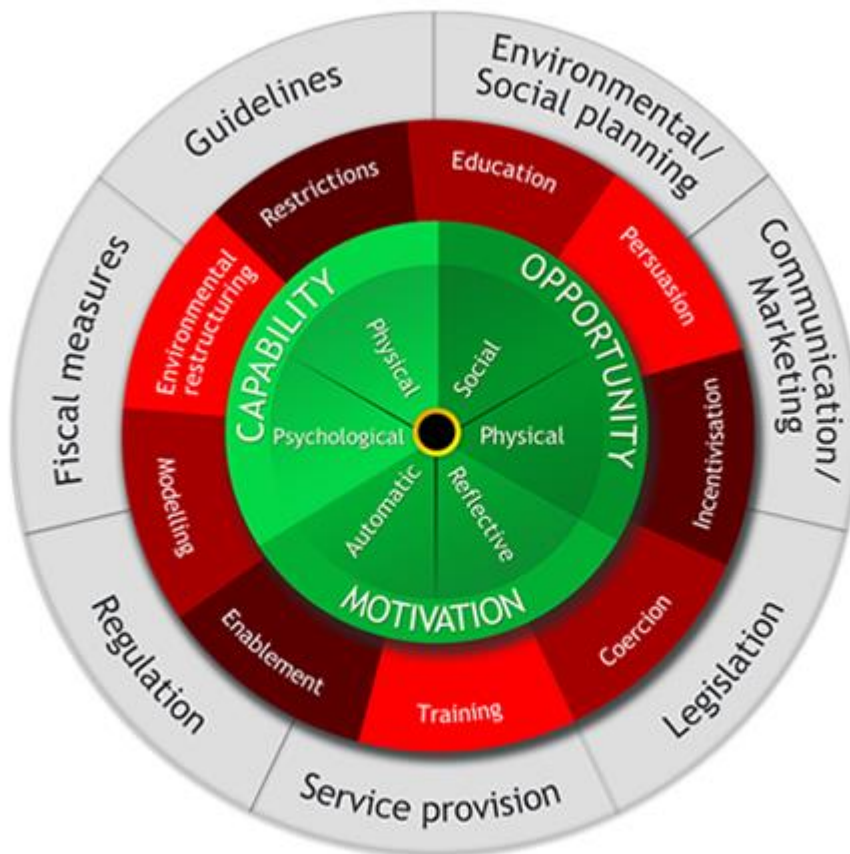
Examination of barriers and facilitators across English- and non-English- speaking populations, using a theoretical framework, would enable the development of a tailored implementation strategy that could be applied internationally to improve clinical practice. Tailored implementation strategies are strategies that aim to improve clinical practice by addressing prospectively identified barriers to change (Baker et al., 2010). A model frequently

used in the development of such tailored implementation strategies is the Behaviour Change Wheel (BCW) (Michie et al., 2011), which has previously been utilised to design behaviour-change interventions in stroke care (Connell et al., 2015; Loft et al., 2017; Shrubsole et al., 2018). The BCW contains three layers. The inner layer incorporates the COM-B theory, in which a behavioural system (B) comprises three conditions essential for identifying behaviour change: capability (C), opportunity (O), and motivation (M). For a visual diagram of the BCW, see figure 1. The first step to developing a tailored implementation strategy is to identify barriers and facilitators in current practice (Baker et al., 2010; Grol & Wensing, 2004). The TDF is a synthesised framework of behaviour-change theories that can be used to determine factors (i.e., barriers and facilitators) influencing health professionals' behaviour (Cane et al., 2012) that aligns with the COM-B and BCW. The TDF comprises 14 domains relating to behaviour, including: 1) knowledge (having an awareness of something existing); 2) skills (ability or proficiency developed through practice); 3) social/professional role and identity (a set of behaviours and personal characteristics of a person in a social/work setting); 4) beliefs about capabilities (acceptance of reality, truth or validity about the abilities or talent that a person can utilise); 5) optimism (confidence that a result will be obtained or desired goals will be achieved); 6) beliefs about consequences (acceptance of truth or reality about outcomes of a particular behaviour); 7) reinforcement (arranging a dependent relationship between a response and a given stimulus to increase the probability of that response); 8) intentions (a decision to act a certain way or perform a behaviour); 9) goals (mental representations of outcomes an individual desires to achieve); 10) memory, attention and decision processes (ability to retain information, make choices and focus on aspects of the environment); 11) environmental context and resources (environmental circumstances that encourages or discourages the acquisition of skills, independence and competence); 12) social influences (interpersonal processes resulting in an individual changing their thoughts,

behaviours or feelings); 13) emotion (a reaction pattern comprising behavioural, experiential and physiological elements in an attempt to deal with an event); and 14) behavioural regulation (capacity to manage or change objectively measured actions) (Cane et al., 2012). The TDF has been used in quantitative and qualitative studies to explore barriers and facilitators in aspects of aphasia practice, including goal setting, information provision, constraint-induced language therapy, timing of intervention, and intensity of intervention (Shrubsole et al., 2018; Young et al., 2018). Use of a theoretical framework to understand outcome measurement practices across English- and non-English- speaking countries may help to develop an implementation strategy to optimise practice.

Therefore, this study aimed to: 1) explore barriers and facilitators to aphasia outcome measurement from the perspective of international aphasia clinicians using a theory informed process; and 2) determine if different barriers and facilitators exist in English- and non-English- speaking countries. No hypothesis was generated for aim 1 due to the exploratory nature and purpose of the aim. With respect to aim 2, given the small number of standardised assessment tools in languages other than English (Fyndanis et al., 2017; Ivanova & Hallowell, 2013), it was hypothesised that clinicians working with people with aphasia from non-English-speaking countries would experience more barriers than clinicians from English-speaking countries, especially for resource-related reasons (e.g., lack of adapted, adequate, and reliable assessment tools).





*Figure 1.* Behaviour Change Wheel (Michie et al., 2014).

## Materials and methods

### *Study design*

This study used a descriptive quantitative design (Bloomfield & Fisher, 2019) using survey methodology. The online survey mode promoted accessibility to international participants, as well as time and cost-efficiency (Creswell & Clark, 2011; Wright, 2017). The survey was designed in accordance with the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) reporting guidelines (Eysenbach, 2004) for best practice in web-based survey development. The University of Queensland Human Research Ethics committee granted approval for this study (approval number: 2020000318).

### *Participants*

Participants were recruited internationally through:

1. The Collaboration of Aphasia Trialists (CATS; [www.aphasiatrials.org](http://www.aphasiatrials.org))
2. Social media (Facebook, Twitter, LinkedIn)
3. Word of mouth – i.e., individuals were encouraged to forward the survey link/email invitation to other eligible individuals in their personal network.

Clinicians who met the following inclusion criteria were eligible to participate in this study:

1. Had worked for at least one year since graduating
2. Were currently working with people with aphasia
3. Had adequate vision to participate in the online survey.

### ***Survey design***

Online survey data were collected using Qualtrics (Qualtrics, Provo, UT). The survey comprised 16 questions, with additional subsections (see supplementary table 1):

- a) Demographic information (questions 1-9). Multiple choice question format with option for open-ended “other” responses.
- b) Current use of outcome measures (questions 10-15). These questions were drawn from Arnold and colleagues’ (2020) survey of outcome measurement practices in Australia. Question formatting comprised Likert rating scales and multiple-choice response (some of which allowed multiple selections to be made) with an option for open-ended “other” responses.
- c) Barriers and facilitators to outcome measurement use (question 16). This question comprised 39 statements reflecting the 14 domains of the TDF. Using Huijg et al.’s (2014) validated question structure, participants rated each statement on a five-point Likert scale. The content of each statement was based on Arnold et al. (2020), with input from the research team to ensure relevance to an international and multi-lingual audience.

### ***Procedures***

The survey was open between December 2020 and March 2021 and could be completed in English, French or Spanish.

### ***Analysis***

Data were exported to a Microsoft Excel (Version 16.0) and stored in a de-identified format on The University of Queensland Research Data Manager (UQRDM) system. Submissions containing only consent and/or demographic information were removed from the data set and excluded from further analysis. Submissions containing consent and demographic information, as well as partial or total TDF survey responses were included in the data set for analysis. Quantitative data were analysed using Version 25.0 of the IBM Statistical Package for the Social Sciences (SPSS; IBM Corp, 2020). Descriptive statistics (counts, means and frequencies) were used to summarise demographic information and information about the current use of outcome measures. Barriers and facilitators to outcome measurement were explored using the approach of Young et al. (2018). This process involved respondents rating statements pertaining to outcome measurement using a five-point Likert scale ranging from “strongly disagree” to “strongly agree”. The frequency of responses in relation to each of the TDF statements was calculated in SPSS. The rate of agreement (frequency of responses for “strongly agree” and “agree”) and disagreement (frequency of responses for “neutral”, “disagree” and “strongly disagree”) was calculated for each of the TDF domains. The mean barrier score for each statement was also calculated. The barrier and facilitator cut-off scores were based on Young and colleagues (2018), whereby a mean score of  $\leq 3$  was classified as a barrier, and a mean score of  $> 3$  was classified as a facilitator. Statements that contained a negative (e.g., “*I do not know which outcome measures to use*”) were reversed for finding the mean barrier score. Each statement was then grouped into its corresponding TDF domain. The total rate of agreement and disagreement and the total mean barrier score for each of the TDF statements were calculated, to determine the perceived barriers and facilitators in relation to

the 14 TDF domains. The TDF domains with the three highest and three lowest scores were considered to have the most impact on clinicians' behaviour. The domains with the three lowest scores were then mapped onto the BCW; subsequently, the corresponding Behaviour Change Techniques (BCTs) were identified (Michie et al., 2014).

To compare barriers and facilitators between English- and non-English- speaking countries, each country was grouped according to its most widely spoken language (Central Intelligence Agency, n.d.) and then dichotomised into "English" or "non-English" categories. The countries included in these categories is provided as supplementary material (see supplementary table 5). The overall mean scores for each of the TDF domains for English- and non-English- speaking categories were then calculated and compared. Young et al.'s (2018) approach was used to determine whether clinicians from non-English-speaking countries faced more barriers than clinicians from English-speaking countries. The sum of scores from each of the TDF statements was calculated for each participant, resulting in 208 total barrier scores. The lower the score for the participant, the more TDF statements that participant rated as barriers. A Mann-Whitney U Test was then used to determine the statistical significance of the mean total barrier score in English- versus non-English-speaking countries.

## **Results**

Three hundred and twelve participants commenced the survey; however, 104 participant responses were excluded from data analysis as they did not complete questions beyond the participant demographic section. Data from 208 participants were included in the analysis (of these, 134 participants completed the entire survey).

### ***Participant characteristics***

Table 1 presents participant characteristic details. Participants came from 25 countries, with the United States most highly represented. Most participants were female within the 25-

34 years age bracket. The majority of participants reported speech-language-pathologist/speech-language-therapist (81.7%, n=187) as their discipline background; however, a variety of different disciplines were represented, including: psychologist (9.6%, n=22), clinical linguist (5.7%, n=13), and neurologist (1.7%, n=4). Almost half of the participants had been working clinically with people with aphasia and their significant others for over 10 years. The two most common settings in which participants saw people with aphasia were *Hospital-based Inpatient Rehabilitation* (27.4%, n=58) and *Community Rehabilitation* (26.9%, n=57). Participants worked with people with aphasia from a variety of post-stroke periods, with the early subacute period (1 week to 3 months) (36.1%, n=90) most frequently reported.

Participant Characteristics	Number of Participants (%)
<b>Age</b>	
18-24	12 (5.8)
25-34	81 (38.9)
35-44	59 (28.4)
45-54	33 (15.9)
55-64	19 (9.1)
65+	4 (1.9)
<b>Gender</b>	
Female	185 (88.9)
Male	18 (8.7)
Prefer not to say	1 (0.5)
Not reported	4 (1.9)
<b>Country</b>	
United States	51 (24.5)
Australia	29 (13.9)
United Kingdom	22 (10.6)
France	15 (7.2)
Spain	13 (6.3)

## International Aphasia Outcome Measurement

Switzerland	12 (5.8)
Germany	10 (4.8)
Denmark	9 (4.3)
New Zealand	8 (3.8)
Philippines	5 (2.4)
Lebanon	4 (1.9)
Chile	4 (1.9)
Norway	3 (1.4)
Belgium	3 (1.4)
Canada	3 (1.4)
Greece	3 (1.4)
Italy	2 (1)
Mexico	2 (1)
Finland	2 (1)
Ghana	2 (1)
Sweden	2 (1)
Austria	1 (0.5)
India	1 (0.5)
Ireland	1 (0.5)
Peru	1 (0.5)
<b>Discipline background*</b>	
Speech-Language Pathologist / Speech-Language Therapist	187 (81.7)
Psychologist/Psychology/Neuropsychologist	22 (9.6)
Clinical Linguist	13 (5.7)
Neurologist/Neurology/Neuroscientist	4 (1.7)
Research	3 (1.3)
<b>Highest level of education completed</b>	
Bachelor degree	43 (20.7)
Graduate certificate / diploma	19 (9.1)
Post-graduate / masters degree	118 (56.7)
PhD	27 (13)
Not reported	1 (0.5)
<b>Number of years worked clinically with people with aphasia / their significant others</b>	
Less than 1 year	4 (1.9)

1-3 years	46 (22.1)
4-10 years	56 (26.9)
More than 10 years	102 (49)
Setting of where clients with aphasia are seen*	
Hospital – inpatient rehabilitation service	58 (27.4)
Community rehabilitation – day hospital / outpatients / community centre / home based care	57(26.9)
Private practice	33 (15.6)
Hospital – acute service	30 (14.2)
University clinic	15 (7.1)
Telehealth / TeleRehabilitation service	6 (2.8)
Residential (aged) care service	4 (1.9)
Neurorehabilitation Centre	2 (0.9)
Aphasia Centre	2 (0.9)
Research	2 (0.9)
National Service	2 (0.9)
Not-for-profit	1 (0.5)
Stage post-stroke of clients with aphasia*	
Hyperacute (<24 hours)	6 (1.4)
Acute (1 day to 7 days)	33 (13.5)
Early sub-acute (1 week to 3 months)	90(36.1)
Late subacute (3 months to 6 months)	41 (13.9)
Chronic (>6 months)	68(26.9)

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*Note.* #n=208 unless otherwise specified; \*participants were able to provide more than one response.

**Table 1.** Participant Characteristics

### ***Current practice in aphasia outcome measurement***

Most participants reported measuring outcomes with people with aphasia “always” (41.3%, n=86) or “often” (31.7%, n=66). Only three (1.4%) respondents reported “never” measuring outcomes with people with aphasia.

The most common method for selecting outcome measures was for each clinician to choose their own outcome measure (47.6%, n=99). Some participants reported having a

standard approach to choosing outcome measures within their workplace (19.7%, n=41). The most common time that participants measured outcomes was at the beginning and end of a pre-determined therapy block (33.2%, n=69). Many participants also reported measuring outcomes on admission and prior to discharge (28.4%, n=59), and at regular time-points in relation to the client's time post-onset (23.6%, n=49). The most reported reason for measuring outcomes with people with aphasia was to "measure progress" (94.5%, n=197 agreement), and to "plan effective rehabilitation" (88.9%, n=185 agreement). The least reported reason for measuring outcomes was to "adhere to workplace requirements" (46.2%, n=96 agreement). The highest rated factors clinicians considered "essential" when choosing outcome measures for people with aphasia were to use a tool that is validated (88.7%, n=181), sensitive or responsive to change (84.9%, n=174), and able to capture outcomes which are important to their clients (82%, n=168).

### ***Barriers and facilitators to outcome measurement***

Overall, participants identified more facilitators than barriers to measuring outcomes with people with aphasia. Out of the 39 TDF statements across all 14 domains, 32 were considered facilitators and seven were considered barriers. Further details for each statement and domain are contained within supplementary table 2.

There were no TDF domains reported as overall barriers (i.e., with a score  $\leq 3$ ); however, individual statements within some of the TDF domains were classified as barriers, thus resulting in overall low mean scores for some of the TDF domains. The three TDF domains with the lowest scores were "environmental context and resources", "behavioural regulation" and "skills". The TDF domain with the lowest mean score was "environmental context and resources" (mean score = 3.03). This domain is defined as a situation that influences the development of skills, independence, adaptive behaviour, abilities, and social competence (Cane et al., 2012). Within this domain, participants rated their level of



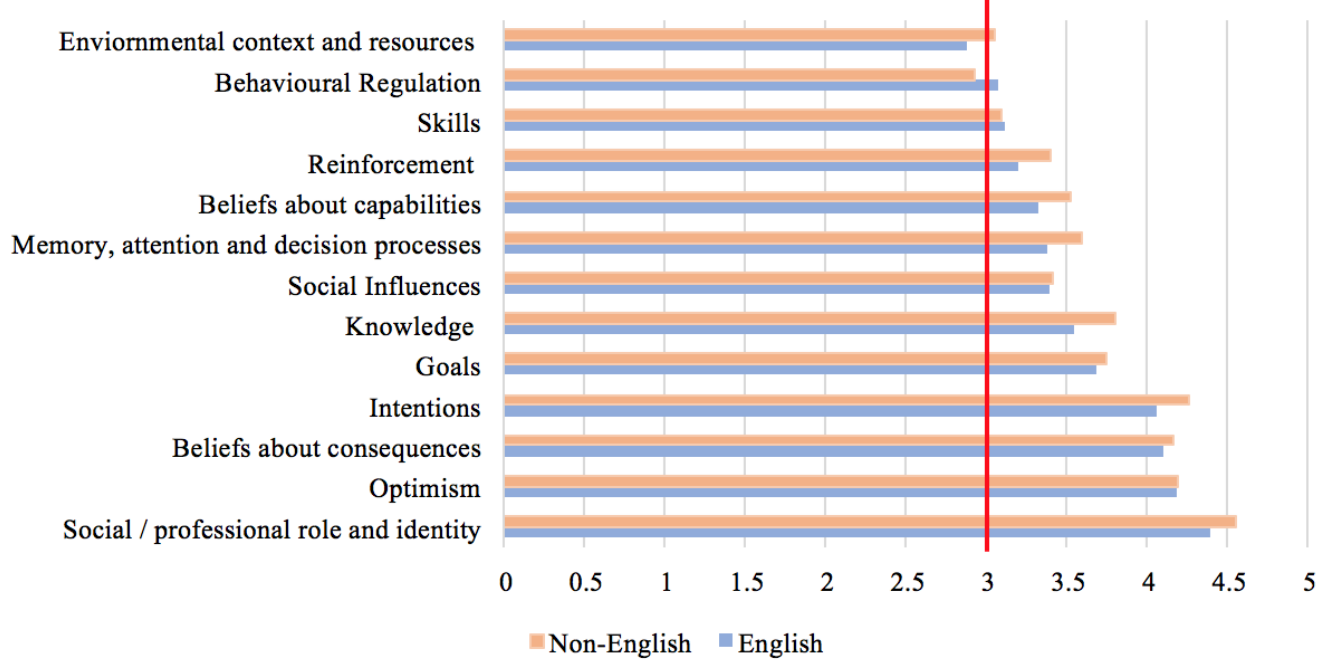
agreement with statements relating to accessibility and availability of adequate resources, time, and caseload priorities. A barrier identified within the “environmental context and resources” domain was that participants did not have “*sufficient access to outcome measures in languages spoken by [their] clients with aphasia*”, as there was an overall low agreement with this statement amongst participants (mean score = 2.7). The TDF domains with the second and third lowest mean scores were “behavioural regulation” (mean score = 3.07), where participants rated their level of agreement with statements relating to workplace strategies and personal systems for measuring outcomes with people with aphasia; and “skills” (mean score = 3.12), where participants rated their level of agreement with statements pertaining to their own level of training and experience, and having the “*skills necessary to align client goals with outcome measures*”. Two individual statements identified as barriers within the “skills” domain were that participants would “*benefit from more training in outcome measurement with people with aphasia*” (score = 2.07) and they do not “*have sufficient training in the use of outcome measures with bilingual or multilingual people with aphasia*” (score = 2.23).

The TDF domain with the highest mean score was “social/professional role and identity” (mean score = 4.42). This domain refers to displayed behaviours and personal attributes in a social and/or work setting (Cane et al., 2012), and indicated high levels of agreement that outcome measurement is “*part of my role*” and “*part of my responsibility as a speech pathologist*”. The TDF domains with the second and third highest mean scores were “optimism” (mean score = 4.18), where participants agreed to being “*optimistic that [they] will be able to measure outcomes with people with aphasia in the future*”, and “emotion”, by which participants agreed to feeling comfortable, and enjoying, measuring outcomes with people with aphasia.

### ***Comparison between English- and non-English-speaking countries***

Figure 2 depicts a comparison of mean scores between English- and non-English-speaking countries for each of the TDF domains. While the mean total barrier score for participants from non-English-speaking countries (mean rank = 89.04, n=81) was lower than those of participants from English-speaking countries (mean rank = 101.12, n=110), the difference was not statistically significant ( $U=3891.5$ ,  $p=0.135$ , two-tailed). A descriptive comparison of the mean scores for each of the TDF domains revealed similarities in the barriers and facilitators between participants from English- and non-English-speaking countries (see supplementary tables 3 and 4). Participants from both English- and non-English-speaking countries identified the same TDF domains as the three least facilitating factors to outcome measurement. These were “environmental context and resources” (English mean score = 2.88; non-English mean score = 3.06), “skills” (English mean score = 3.12; non-English mean score = 3.1) and “behavioural regulation” (English mean score = 3.07; non-English mean score = 2.93). The mean scores indicate that both English- and non-English-speaking countries identified one barrier each, although no barriers (other than some isolated statements within certain domains) were identified in the overall results. For English-speaking participants, this was “environmental context and resources” (mean score = 2.88), and for non-English-speaking participants, this was “behavioural regulation” (mean score = 2.93). As statistical analysis of total barrier scores revealed no significant difference between English- and non-English-speaking results, no further analysis was completed to compare individual TDF scores.

### Comparison of Barriers and Facilitators between participants from English vs Non-English speaking countries



**Figure 2.** Comparison of barriers and facilitators between participants from English- and non-English- speaking countries. *Key:* Vertical line indicates cut-off point for barriers versus facilitators. All items above 3 represent facilitators, while all items below 3 represent barriers.

The TDF domain with the highest mean score for participants from English-speaking countries was “social/professional role and identity” (mean score = 4.39). Similarly, this domain was identified as the main facilitator in participants from non-English-speaking countries (mean score = 4.55). The TDF domains with the second and third highest mean scores identified by participants from English-speaking countries were “optimism” (mean score = 4.18) and “beliefs about consequences” (mean score = 4.1), whereby participants rated their level of agreement with statements pertaining to the importance of outcome measurement for therapy planning, improving patient motivation, demonstrating the effects of intervention, educating patients and their families and improving patient outcomes. Non-English-speaking participants identified “intentions” (mean score = 4.26), by which clinicians rated their level of agreement with intending to conduct outcome measures with people with

aphasia, and “emotion” (mean score = 4.26) as the TDF domains with the second highest mean scores. The TDF domain with the third highest mean score for non-English-speaking participants was “optimism” (mean score = 4.19).

## **Discussion**

This study aimed to investigate barriers and facilitators to aphasia outcome measurement from the perspective of an international sample of clinicians. A second aim was to determine if perceived barriers and facilitators differed between English- and non-English-speaking countries. The results indicate that internationally, clinicians are measuring outcomes for people with aphasia. They do this to measure progress, they choose their own outcome measures, and the timing of measurement is dictated by the length of the service provided (on admission and prior to discharge, and at the beginning and end of a therapy block). Clinicians report that it is most important that outcome measures are validated, able to detect change, and reflect outcomes that are important to people with aphasia. Clinicians across both English- and non-English-speaking countries experience the same challenges and their practice is most impacted by availability of resources, skills, and behavioural regulation.

### ***Barriers and facilitators to measuring outcomes***

Overall, the TDF domain with the lowest mean score was “environmental context and resources” in relation to time, accessibility and availability of resources, and caseload priorities. This is also consistent with the Australian study by Arnold et al. (2020), which found that clinicians had limited time for conducting outcome measures with people with aphasia. A number of other aphasia studies have also found that environmental factors, including inadequate time, lack of appropriate resources, short-staffing and insufficient facilities, are key barriers to adhering to aphasia clinical practice guidelines (Foster et al., 2014; Klippi et al., 2012; Law et al., 2009; Page & Wallace, 2014; Rose et al., 2014; Shrubsole et al., 2018; Young et al., 2018). Studies that have investigated barriers to outcome

measurement in general allied health practice have also identified time and availability of resources to be key barriers (Duncan & Murray, 2012; McCracken et al., 2021; McDonnell et al., 2018). The findings of the current study, in line with previous literature, therefore suggest that clinicians across different countries face environmental and contextual barriers when measuring outcomes with people with aphasia.

The TDF domain with the second lowest score was “behavioural regulation”, regarding a lack of workplace and personal systems to measuring outcomes with people with aphasia. Poor organisational logistics have been reported as a barrier in other studies investigating outcome measurement in allied health practice (Duncan & Murray, 2012) and in aphasia practice (Arnold et al., 2020). These results indicate a lack of workplace and personal systems across countries in outcome measurement with people with aphasia. Clinicians also reported insufficient skills necessary to align client goals with outcome measures, and inadequate experience and training in measuring outcomes with people with aphasia. These results are similar to the findings presented by previous aphasia studies, which have also identified poor skills and training as impeding factors to using outcome measures (Arnold et al., 2020) and general aphasia management (Kippli et al., 2012).

Both English- and non-English- speaking clinicians in the current study identified two individual TDF statements within the “environmental context and resources” domain and the “skills” domain, each relating to poor accessibility of language-appropriate outcome measurement tools and limited training in measuring outcomes with multi-lingual people with aphasia. This closely aligns with studies exploring aphasia management in languages other than English (Fyndanis et al., 2017; Ivanova & Hallowell, 2013), and suggests that there are insufficient resources for outcome measurement across different languages. Similarly, limited clinician training in outcome measurement with multilingual people with aphasia, as identified in the current study, is supported by American and Norwegian studies (Centeno,

2015; Norvik et al., 2022), in which the majority (77% for American clinicians; 81% for Norwegian clinicians) reported having no to minimal education and training for providing intervention for multilingual people with aphasia. These findings therefore indicate a need for further research in this area to improve outcome measurement practices in aphasia rehabilitation across languages and within the multilingual population.

Several TDF domains were identified as key facilitators in measuring outcomes with people with aphasia, including “social/professional role and identity”, “optimism” and “emotion”. These domains are considered important in the uptake of aphasia practice guidelines (Young et al., 2018), as understanding ones’ role in measuring outcomes is more likely to result in the uptake of clinical recommendations outlining outcome measurement practice. Similarly, feeling optimistic and comfortable in the use of outcome measures with people with aphasia is more likely to promote adherence to clinical recommendations. Arnold et al. (2020) presented similar findings in their study, with a strong level of agreement amongst Australian speech-language-pathologists that, as clinicians working with people with aphasia, measuring outcomes is part of their role and responsibility. “Optimism” and “emotion” also appear to be frequently reported facilitators in aphasia studies (Arnold et al., 2020; Young et al., 2018). These findings reveal a general consensus that clinicians feel optimistic and comfortable in measuring outcomes with people with aphasia and understand that it is part of their role and responsibility.

### ***Comparison of barriers and facilitators in English- versus non-English-speaking countries***

The primary hypothesis for this study was that clinicians from non-English-speaking countries would face more barriers than clinicians from English-speaking countries in outcome measurement with people with aphasia. However, the findings did not support this hypothesis and instead revealed parallel results in mean total barrier scores between English- and non-English-speaking groups. Whilst limited, previous literature indicates the presence of

additional challenges for clinicians working with people with aphasia in non-English-speaking countries due to poor availability of resources, particularly assessments, in languages other than English (Fyndanis et al., 2017; Ivanova & Hallowell, 2013; Kong, 2011).

In the present study, similarities were found in the TDF domains with the lowest mean scores identified by clinicians from English- and non-English-speaking countries. Both groups identified “environmental context and resources”, “behavioural regulation”, and “skills” as the three TDF domains with the lowest mean scores. This closely aligns with international literature exploring the barriers to outcome measurement in allied health practice in non-English-speaking countries, including the Netherlands and Saudi Arabia, which identify inadequate time and facilities, unavailability and impracticability of outcome measurement tools, and limited skills in using outcome measures (Al-Muqiren et al., 2017; Swinkels et al., 2011). Furthermore, aphasia studies conducted in Finland and Sweden have also identified insufficient resources (Persson et al., 2021) and limited training (Kippli et al., 2012) as key challenges to implementing and maintaining current best practice. Studies investigating aphasia practice in English-speaking countries have also identified challenges associated with time constraints and organisational boundaries (Law et al., 2009), as well as insufficient clinical skills, resources, and training needed to implement aphasia practice guidelines (Cruice et al., 2020; Hadely et al., 2014; Trebilcock et al., 2019). More broadly, studies involving other allied health practices have presented similar challenges, including appropriateness of resources, insufficient skills in scoring and interpreting outcome measurement results (Jette et al., 2009), time constraints, poor organisational systems to determine which measures to use, and poor accessibility of outcome measures (Duncan & Murray, 2012; Kall et al., 2016; Maher & Williams, 2005). Findings from the current study, which support and build on discussed literature, indicate that clinicians from English- and

non-English- speaking countries face similar challenges in measuring outcomes with people with aphasia, including environmental and contextual constraints, limited skills and insufficient personal and workplace systems.

Common facilitators were also found across English- and non-English- speaking countries in the present study, including “social/professional role and identity” and “optimism”. “Intentions” and “emotion” were also considered as facilitators by clinicians from non-English-speaking countries, indicating that they have strong intentions to conduct outcome measurement, and that they feel comfortable and enjoy measuring outcomes with people with aphasia. Similarly, these domains were rated highly by clinicians from English-speaking countries, who also identified “beliefs about consequences” as a key facilitator. The facilitators identified by clinicians from both English- and non-English- speaking countries have been frequently identified in other aphasia studies involving participants from English-speaking countries (Arnold et al., 2020; Trebilcock et al., 2019; Young et al., 2018). However, limited literature exists regarding the facilitators in aphasia practice for clinicians in other languages.

### ***Developing tailored implementation strategies***

From the key barriers identified in this study (i.e., the TDF domains with the lowest mean scores), it is possible to determine potentially relevant implementation strategies. Specifically, Michie and colleagues (2014) describe how the TDF domains relate to the BCW and can subsequently guide selection of Behaviour Change Techniques (BCTs). The BCTs corresponding to each of the three lowest-scoring TDF domains could then be used to develop tailored implementation strategies to reduce or eliminate identified challenges, in order to facilitate and improve uptake of clinical recommendations for outcome measurement in aphasia practice. Examples of BCTs associated with “environmental context and resources” challenges could include restructuring the physical and social environment (such as providing



access to culturally appropriate and translated measurement tools and identifying local champions to promote outcome measurement within services) and introducing prompts/cues to facilitate recommended outcome measurement practice (such as developing protocols, checklists, or assessment reporting templates). To reduce barriers associated with “behavioural regulation”, a method for clinicians to monitor and record consequences of performing appropriate (culture- and language-specific) outcome measures could be established. BCTs corresponding to the “skills” domain includes behavioural instruction, demonstration, and practice opportunities, whereby clinicians could increase their skills through training that encompasses practicing and performing achievable tasks of increasing difficulty. These potential implementation strategies require further development and refinement in future research.

### ***Strengths and limitations***

This study filled a gap in current literature regarding outcome measurement in international aphasia practice. Use of the TDF enabled identification of barriers and facilitators in order to promote the development of a tailored implementation strategy to improve uptake of clinical recommendations. It should be noted that the current study has focused on clinical outcome measurement practices; barriers and facilitators to research outcome measurement have been investigated elsewhere (see Wallace et al., 2021). The authors acknowledge several limitations that may have affected the results of the current research. The number of participants from each country varied greatly, and therefore results may not be equally representative of clinicians from all countries. Additionally, the number of statements per TDF domain differed within the survey. Therefore, some domains may not be as equally represented as domains comprising a larger number of TDF statements. As the countries were dichotomised into English- and non-English- speaking categories, the assumption that there is homogeneity within each of the distinct groups may also be a

limitation. There is potential bias resultant from the sampling method chosen, as clinicians who chose to partake in the study about measuring outcomes are likely motivated with positive attitudes and could be more likely to already perform outcome measures in their clinical practice. Similarly, there is limited knowledge about the individual participants and their experience with engaging in professional development activities, such as attending conferences on aphasia management and specialised research on outcome measurement practices. Questions were predominantly multiple-choice and rating scales. Acquiescence bias was avoided by: (a) enabling free text entry on questions via an “other” response; and (b) allowing participants to progress through the survey without answering all questions. It must be acknowledged, however, that the use of multiple-choice questions may have limited the completeness of participant responses and the results of this research should be viewed with this limitation in mind.

### ***Future research***

While this study founded the initial stages of improving outcome measurement practices, future research could further develop and refine the proposed strategies. A qualitative investigation comprising in-depth interviewing may supplement this study and enable a more comprehensive view of perceived influencing factors to measuring outcomes.

### **Conclusion**

Internationally, clinicians are measuring outcomes with people with aphasia. Clinicians from both English- and non-English- speaking countries feel optimistic and comfortable in this task and feel that it is part of their role. Clinicians face challenges in outcome measurement that are associated with availability of resources, time constraints, competing caseload priorities, training, and workplace and personal systems. Strategies, such as: providing access to culturally appropriate measurement tools, promoting outcome measurement within services, introducing protocols, checklists, or templates for outcome

measurement, and incorporating practice opportunities within training sessions for measuring outcomes; would assist clinicians to reduce these barriers and adopt best practice.

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### **Declaration of statement of interest**

The authors declare no conflicts of interest.

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**Supplementary files****Supplementary Table 1.** Survey questions, response format and responses (n)

Question	Survey Question	Response format	Responses (n)
<b>Demographics</b>			
2	Please select your age range	Multiple Choice	208
3	Please select your gender	Multiple Choice	204
4	Please select the country that you work in	Multiple Choice	208
5	What is your discipline background?	Multiple Choice	207
6	Please select the highest level of education you have completed	Multiple Choice	207
7	Please select the number of years that you have worked clinically with people with aphasia/their significant others	Multiple Choice	208
8	Which of the following best describes the setting in which you currently see most of your clients with aphasia?	Multiple Choice	208
9	At what stage post-stroke are most of your clients with aphasia?	Multiple Choice	208
<b>Current Practice</b>			
10	Do you measure outcomes for your clients with aphasia?	Always / Often / Sometimes / Rarely / Never	208
11	I measure outcomes with people with aphasia to: <ul style="list-style-type: none"> <li>• Demonstrate the effectiveness of my intervention</li> <li>• Evaluate the need for ongoing intervention</li> <li>• Measure progress</li> <li>• Help direct the plan of care</li> <li>• Plan effective rehabilitation intervention</li> <li>• Enhance communication within multi-disciplinary team/ other health care professionals</li> <li>• Identify the patient's strengths</li> <li>• Identify the patient's problems</li> <li>• Focus the intervention</li> <li>• Motivate the patient</li> </ul>	Strongly agree/ Agree/ Neutral/ Disagree/ Strongly disagree	208

	<ul style="list-style-type: none"> <li>• Enhance communication with the patient</li> <li>• Enhance communication with patient's family</li> <li>• Comply with clinical guidelines</li> <li>• Inform discussions about prognosis</li> <li>• Adhere with workplace requirements</li> <li>• Support my decision making</li> <li>• Other (please specify)</li> </ul>		
12	What best describes the main approach to selecting outcome measures for clients with aphasia in your workplace?	Multiple Choice	207
13	What factors are most important when choosing an outcome measure for a client with aphasia?	Essential/ Important but not essential/ Not important	205
	• Can capture change (sensitive or responsive to change).		204
	• Measures what it says it measures (valid).		205
	• Produces the same results regardless of who administers it (reliable).		205
	• Easy to administer.		205
	• Quick to administer.		205
	• Does not require training.		204
	• Cost		205
	• Consistent with what other speech pathologists are using.		205
	• Training is available.		204
	• Captures outcomes which are important to my client.		205
	• Aphasia friendly.		205
	• Easy to score, analyse and interpret.		204
	• Multimodality of the measure.		205
	• Other (please specify)		202
14	When do you usually measure outcomes with people with aphasia?	Multiple Choice	203
15	Do you measure outcomes for the carers/significant others of your clients with aphasia?	Always / Often / Sometimes / Rarely / Never	203

**Barriers and facilitators to outcome measurement**

16	Please read each statement and then select the response that indicates the extent to which you agree or disagree.	Strongly agree/ Agree/ Neither agree nor disagree/	
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	Strongly disagree	
1. I am familiar with the evidence for outcome measurement with people with aphasia.		191
2. I would benefit from more training in outcome measurement with people with aphasia.		191
3. I have prior experience in outcome measurement with people with aphasia.		189
4. Part of my responsibility as a speech pathologist includes outcome measurement with people with aphasia.		189
5. Outcome measurement with people with aphasia is not part of my role.		186
6. I am confident conducting outcome measurement with people with aphasia.		189
7. I have found outcome measurement with people with aphasia difficult.		185
8. I have little control over which outcome measures I use with people with aphasia		187
9. I am doubtful that outcome measurement with people with aphasia will improve patient outcomes.		190
10. I believe that outcome measurement with people with aphasia is an effective way to educate patients and their families.		187
11. Seeing the benefits of outcome measurement with people with aphasia is rewarding.		171
12. There are incentives at my workplace for conducting outcome measurement with people with aphasia.		190
13. I always intend to conduct outcome measurement with people with aphasia.		187
14. Outcome measurement with people with aphasia is not a priority for me.		181
15. I am working towards conducting outcome measurement with all patients with aphasia.		189
16. Outcome measurement with people with aphasia is something I always do as part of my routine.		188
17. I have reasons for sometimes not conducting outcome measurement with people with aphasia.		185
18. I sometimes forget to conduct outcome measurement with people with aphasia.		189
		184

19. I have insufficient time to conduct outcome measurement with people with aphasia.	181
20. Other caseload priorities prevent me from conducting outcome measurement with people with aphasia.	191
21. I do not have the necessary resources for conducting outcome measurement with people with aphasia.	182
22. Outcome measurement is what patients with aphasia want.	175
23. My colleagues are consistently conducting outcome measurement with people with aphasia.	188
24. My colleagues in the multidisciplinary or speech pathology teams are not supportive of me conducting outcome measurement with people with aphasia.	185
25. I like conducting outcome measurement with people with aphasia.	185
26. I do not feel comfortable conducting outcome measurement with people with aphasia.	176
27. I have a clear system for checking if I have engaged in outcome measurement for each patient with aphasia.	189
28. My department has strategies for conducting outcome measurement with people with aphasia.	191
29. I know have the skills necessary to align client goals with outcome measures.	191
30. I know what factors to consider when choosing an outcome measure for people with aphasia.	191
31. I believe that conducting outcome measurement with people with aphasia allows me to demonstrate the effects of my intervention.	189
32. I believe that conducting outcome measurement with people with aphasia will improve their motivation for therapy	186
33. I believe that outcome measurement with people with aphasia is important for therapy planning.	187
34. I do not know which outcome measures to use.	187
35. I have sufficient access to outcome measures in languages spoken by my clients with aphasia.	187

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|--|-----|
| 36. I do not have the confidence to select which outcome measures to use with bilingual or multilingual people with aphasia. | 186 |
| 37. I have sufficient training in the use of outcome measures with bilingual or multilingual people with aphasia.            |     |
| 38. There are other aspects of my role that are more urgent than conducting outcome measurement with people with aphasia.    | 191 |
| 39. I am optimistic that I will be able to conduct outcome measurement with people with aphasia in the future.               | 186 |

*Supplementary Table 2. TDF statements and domains with level of agreement, mean and median scores.*

Domain	TDF Survey Statements	Number of participants (%) n=208								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
<b>1) Knowledge</b>	I am familiar with the evidence for outcome measurement with people with aphasia	34 (16.3%)	83 (39.9%)	32 (15.4%)	39 (18.8%)	3 (1.4%)	17 (8.2%)	74 (38.7%)	117 (61.3%)	3.55	4
	I do not know which outcome measures to use (R)	6 (2.9%)	33 (15.9%)	33 (15.9%)	71 (24.1%)	43 (20.7%)	22 (20.5%)	147 *39 (60.7%) (18.8%)	39 *147 (60.7%)	3.6*	4*
	I know what factors to consider when choosing an outcome measure for people with aphasia	42 (20.2%)	99 (47.6%)	27 (13%)	20 (9.6%)	3 (1.4%)	17 (8.2%)	50 (42.7%)	141 (73.8%)	3.8	4
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>54.3</b>	<b>135</b>	<b>3.65</b>	<b>-</b>
<b>2) Skills</b>	I would benefit from more training in outcome measurement with people with aphasia (R)	48 (23.1%)	93 (44.7%)	40 (19.2%)	8 (3.8%)	2 (1%)	17 (8.2%)	50 (24%) *141 (67.8%)	141 *50 (24%)	*2.07	2*
	I have prior experience in outcome measurement with people with aphasia	52 (25%)	112 (53.8%)	11 (5.3%)	11 (5.3%)	2 (1.4%)	20 (9.6%)	24 (12.8%)	164 (87.2%)	4.05	4
	I have sufficient training in the use of outcome measures with bilingual or multilingual people with aphasia	10 (4.8%)	18 (8.7%)	33 (15.9%)	70 (33.7%)	55 (26.4%)	22 (10.58%)	158 (84.9%)	28 (15.1%)	2.23	2



Domain	TDF Survey Statements	Number of participants (%) n=208								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
	I have the skills necessary to align client goals with outcome measures	55 (26.4%)	105 (50.5%)	19 (9.1%)	8 (3.8%)	2 (1%)	19 (9.1%)	29 (13.9%)	160 (84.7%)	4.07	2
<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>88</b>	<b>100.5</b>	<b>3.12</b>	<b>-</b>
<b>3) Social/ professional role and identity</b>	Part of my responsibility as a speech pathologist includes outcome measurement with people with aphasia	91 (43.8%)	82 (39.4%)	13 (6.3%)	2 (1%)	1 (0.5%)	19 (9.1%)	16 (8.47%)	173 (91.5%)	4.37	5
	Outcome measurement with people with aphasia is not part of my role (R)	2 (1%)	3 (1.4%)	15 (7.2%)	40 (19.2%)	126 (60.6%)	22 (10.58%)	181 (87%) *5 (2.4%)	5 (2.4%) *181 (87%)	4.46*	5*
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>10.5</b>	<b>177</b>	<b>4.42</b>
<b>4) Beliefs about capabilities</b>	I do not have the confidence to select which outcome measures to use with bilingual or multilingual people with aphasia (R)	26 (12.5%)	74 (35.6%)	33 (15.9%)	31 (14.9%)	23 (11.1%)	21 (10.1%)	87 (41.9%) *100 (48.1%)	100 (48.1%) *87 (41.9%)	1.99*	2*
	I am confident in my ability to conduct outcome measurement with people with aphasia	52 (25%)	98 (47.1%)	24 (11.5%)	15 (7.2%)	0 (0.0%)	19 (9.1%)	39 (18.7%)	150 (72.1%)	3.99	4
	I have found outcome measurement with people with aphasia difficult (R)	8 (3.8%)	55 (26.4%)	35 (16.8%)	65 (31.3%)	26 (12.5%)	19 (9.1%)	126 (60.4%) *63 (30.2%)	63 (30.2%) *126 (60.4%)	3.24*	4*

Domain	TDF Survey Statements	Number of participants (%) n=208								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
	I have little control over which outcome measures I use with people with aphasia (R)	7 (3.4%)	25 (12%)	34 (16.3%)	63 (30.3%)	56 (26.9%)	22 (10.6%)	153 (73.5%) *32 (15.4%)	32 (15.4%) *153 (73.5%)	3.72*	4*
<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>58.5</b>	<b>83</b>	<b>3.25</b>	<b>-</b>
<b>5) Optimism</b>	I am optimistic that I will be able to conduct outcome measures with people with aphasia in the future	66 (31.7%)	93 (44.7%)	22 (10.6%)	5 (2.4%)	0 (0.0%)	22 (10.6%)	27 (13%)	159 (76.4%)	4.18	4
<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>27</b>	<b>159</b>	<b>4.18</b>	
<b>6) Beliefs about consequences</b>	I believe that outcome measurement with people with aphasia is important for therapy planning	91 (43.8%)	81 (38.9%)	13 (6.3%)	2 (1%)	2 (1%)	19 (9.1%)	17 (16.4%)	172 (82.7%)	4.36	5
	I believe that conducting measurement with people with aphasia will improve their motivation for therapy	48 (23.1%)	98 (47.1%)	37 (17.8%)	6 (2.9%)	2 (1%)	17 (8.2%)	45 (22.7%)	146 (70.2%)	3.96	4
	I believe that conducting outcome measurement with people with aphasia allows me to demonstrate the effects of my intervention	74 (35.6%)	87 (41.8%)	19 (9.1%)	9 (4.3%)	2 (1%)	17 (8.2%)	30 (14.4%)	161 (77.4%)	4.16	4
	I believe that outcome measurement with people with aphasia is an effective way to educate patients and their families	56 (26.9%)	97 (46.4%)	29 (13.9%)	5 (2.4%)	3 (1.4%)	18 (8.7%)	37 (17.7%)	153 (73.3%)	4.04	4

Domain	TDF Survey Statements	Number of participants (%) n=208								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
	I am doubtful that outcome measurement with people with aphasia will improve patient outcomes (R)	3 (1.4%)	13 (6.3%)	24 (11.5%)	73 (35.1%)	74 (35.6%)	21 (10.1%)	171 (82.2%) *16 (7.7%)	16 (7.7%) *171 (82.2%)	4.08*	1*
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>29</b>	<b>160.6</b>	<b>4.12</b>	<b>-</b>
7) Reinforcement	There are incentives at my workplace for conducting outcome measurement with people with aphasia	5 (2.4%)	19 (9.1%)	40 (19.2%)	60 (28.8%)	47 (22.6%)	37 (17.8%)	147 (70.6%)	24 (11.5%)	2.27	2
	Seeing the benefits of outcome measurement with people with aphasia is rewarding	80 (38.5%)	85 (40.9%)	19 (9.1%)	3 (1.4%)	0 (0.0%)	21 (10.1%)	22 (10.5%)	165 (79.4%)	4.30	4
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>84.5</b>	<b>94.5</b>	<b>3.28</b>	<b>-</b>
8) Intentions	I always intend to conduct outcome measurement with people with aphasia	67 (32.2%)	95 (45.7%)	19 (9.1%)	7 (3.4%)	2 (1%)	18 (8.7%)	28 (13.5%)	162 (77.9%)	4.15	4
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>28</b>	<b>162</b>	<b>4.14</b>	<b>-</b>
9) Goals	I am working towards conducting outcome measures with all patients with aphasia.	54 (26%)	76 (36.5%)	31 (14.9%)	17 (8.2%)	3 (1.4%)	27 (13%)	51 (24.5%)	130 (62.5%)	3.89	4
	There are other aspects of my role that are more urgent than conducting outcome measurement with people with aphasia (R)	20 (9.6%)	47 (22.6%)	52 (25%)	45 (21.6%)	27 (13%)	17 (8.2%)	124 (59.6%) *67 (32.2%)	67 (32.2%) *124 (59.6%)	3.06*	3

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Domain	TDF Survey Statements	Number of participants (%) n=208								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
	Outcome measurement with people with aphasia is not part of my role. (R)	2 (1%)	3 (1.4%)	15 (7.2%)	40 (19.2%)	125 (60.1%)	23 (11.1%)	180 (97.3%) *5 (2.7%)	5 (2.7%) *180 (97.3%)	4.5*	5
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>87.5</b>	<b>98.5</b>	<b>3.48</b>	-
<b>10) Memory, attention and decision processes</b>	I have reasons for sometimes not conducting outcome measurement with people with aphasia	14 (6.7%)	97 (46.6%)	28 (13.5%)	33 (15.9%)	16 (7.7%)	20 (9.6%)	77 (37.1%)	111 (53.3%)	3.31	4
	Outcome measurement with people with aphasia is something I always do as part of my routine	47 (22.6%)	73 (35.1%)	29 (13.9%)	35 (16.8%)	5 (2.4%)	19 (9.1%)	69 (33.1%)	120 (57.7%)	3.64	2
	I sometimes forget to conduct outcome measurement with people with aphasia (R)	8 (3.8%)	46 (22.1%)	35 (16.8%)	49 (23.6%)	47 (22.6%)	23 (11%)	131 (63%) *54 (25.9%)	54 (25.9%) *131 (63%)	3.43*	2*
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>66.67</b>	<b>120.67</b>	3.46	-
<b>11) Environmental context and resources</b>	I have sufficient access to outcome measures in languages spoken by my clients with aphasia	13 (6.3%)	42 (20.2%)	37 (17.8%)	66 (31.7%)	29 (13.9%)	21 (10.1%)	132 (63.4%)	55 (26.5%)	2.7	2
	In the organization I work, all necessary resources are available for conducting outcome measures with people with aphasia	26 (12.5%)	53 (25.5%)	37 (17.8%)	42 (20.2%)	23 (11.1%)	27 (13%)	102 (49.1%)	79 (38%)	3.09	3
	I have insufficient time to conduct outcome measurement with people with aphasia (R)	19 (9.1%)	48 (23.1%)	38 (18.3%)	58 (27.9%)	26 (12.5%)	19 (9.1%)	122 (58.7%) *67 (32.2%)	67 (32.2%) *122 (58.7%)	3.13*	4*

Domain	TDF Survey Statements	Number of participants (%) n=208								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
	Other caseload priorities prevent me from conducting outcome measurement with people with aphasia (R)	16 (7.7%)	45 (21.6%)	40 (19.2%)	50 (24%)	33 (15.9%)	24 (11.5%)	123 (59.1%) *61 (29.3%)	61 (29.3%) *123 (59.1%)	3.21*	4*
<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>90.5</b>	<b>94.75</b>	<b>3.03</b>	<b>-</b>
<b>12) Social influences</b>											
	My colleagues are consistently conducting outcome measurement with people with aphasia	18 (8.7%)	49 (23.6%)	43 (20.7%)	55 (26.4%)	17 (8.2%)	26 (12.5%)	115 (55.3%)	67 (32.3%)	2.98	2
	My colleagues in the multidisciplinary or speech pathology team are not supportive of me conducting outcome measurement with people with aphasia (R)	5 (2.4%)	14 (6.7%)	25 (12%)	56 (26.9%)	75 (36.1%)	33 (15.9%)	156 (75%) *19 (9.1%)	19 (9.1%) *156 (75%)	4.04*	5*
	Outcome measurement is what patients with aphasia want	13 (6.3%)	51 (24.5%)	93 (44.7%)	26 (12.5%)	8 (3.8%)	17 (8.2%)	127 (61%)	64 (30.8)	3.18	3
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>87</b>	<b>95.67</b>	<b>3.4</b>
<b>13) Emotion</b>	I do not feel comfortable conducting outcome measurement with people with aphasia (R)	0 (0.0%)	8 (3.8%)	20 (9.6%)	74 (35.6%)	83 (39.9%)	23 (11%)	177 (85.7%) *8 (3.8%)	8 (3.8%) *177 (85.7%)	4.25	1
	I like conducting outcome measurement with people with aphasia	58 (27.9%)	87 (41.8%)	36 (17.3%)	7 (3.4%)	0	20 (9.6%)	43 (20.7%)	145 (69.7%)	4.04	2
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>25.5</b>	<b>161</b>	<b>4.15</b>

Domain	TDF Survey Statements	Number of participants (%) n=208								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
<b>14) Behavioural regulation</b>	My workplace has strategies for conducting outcome measurement with people with aphasia	24 (11.5%)	53 (25.5%)	28 (13.5%)	52 (25%)	19 (9.1%)	32 (15.4%)	99 (47.6%)	77 (37%)	3.06	4
	I have a clear system for checking if I have conducted outcome measurement for each patient with aphasia	24 (11.5%)	52 (25%)	36 (17.3%)	59 (28.4%)	14 (6.7%)	23 (11%)	109 (52.4%)	76 (36.5%)	3.07	2
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>104</b>	<b>76.5</b>	<b>3.07</b>	-

Number of participants selecting each level of agreement with TDF statements for each domain and associated means and medians. 1=strongly disagree; 2=disagree; 3=neither agree nor disagree; 4=agree; 5=strongly agree; (R)=reversed results; <A = Less than agreement (Strongly disagree, Disagree, neither agree nor disagree); A = Agreement (Agree, Strongly Agree). Barrier = ≤3, facilitator = >3

**Supplementary Table 3: TDF statements and domains with level of agreement, mean and median scores for participants from English-speaking countries only.**

Domain	TDF Survey Statements	Number of participants (%) n=114								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
<b>1) Knowledge</b>	I am familiar with the evidence for outcome measurement with people with aphasia	16 (14%)	48 (42.1%)	19 (16.7%)	24 (21.1%)	3 (2.6%)	4 (3.5%)	46 (41.8%)	64 (58.2%)	3.45	4
	I do not know which outcome measures to use (R)	3 (2.6%)	24 (21.1%)	19 (16.7%)	42 (36.8%)	20 (17.5%)	6 (5.3%)	81 (75%) *27 (25%)	27 (25%) *81 (75%)	3.48*	4*
	I know what factors to consider when choosing an outcome measure for people with aphasia	20 (17.5%)	55 (48.2%)	19 (16.7%)	16 (14%)	0 (0%)	4 (3.5%)	35 (31.8%)	75 (68.2%)	3.72	4
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>36 (33%)</b>	<b>73.3 (67%)</b>	<b>3.55</b>	<b>-</b>
<b>2) Skills</b>	I would benefit from more training in outcome measurement with people with aphasia (R)	23 (20.2%)	66 (57.9%)	14 (12.3%)	5 (4.4%)	2 (1.8%)	4 (3.5%)	21 (19.1%) *89 (80.9%)	89 (80.9%) *21 (19.1%)	2.06*	2*
	I have prior experience in outcome measurement with people with aphasia	29 (25.4%)	72 (63.2%)	3 (2.6%)	6 (5.3%)	0 (0%)	4 (3.5%)	9 (8.2%)	101 (91.8%)	4.13	4
	I have sufficient training in the use of outcome measures with	6 (5.3%)	7 (6.1%)	16 (14%)	43 (37.7%)	34 (29.8%)	8 (7%)	93 (87.7%)	13 (12.3%)	2.13	2

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Domain	TDF Survey Statements	Number of participants (%) n=114								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
	bilingual or multilingual people with aphasia										
	I have the skills necessary to align client goals with outcome measures	32 (28.1%)	66 (57.9%)	7 (6.1%)	5 (4.4%)	0 (0%)	4 (3.5%)	12 (10.9%)	98 (89.1%)	4.14	4
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>46.56%</b>	<b>53.44%</b>	<b>3.12</b>	
<b>3) Social/ professional role and identity</b>	Part of my responsibility as a speech pathologist includes outcome measurement with people with aphasia	47 (41.2%)	51 (44.7%)	8 (7%)	2 (1.8%)	1 (0.9%)	5 (4.4%)	11 (10.1%)	98 (89.9%)	4.29	4
	Outcome measurement with people with aphasia is not part of my role (R)	0 (0%)	2 (1.8%)	9 (7.9%)	31 (27.2%)	65 (57%)	7 (6.1%)	105 (98.1%) *2 (1.9%)	2 (1.9%) *105 (98.1%)	4.49*	5*
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>6.02%</b>	<b>93.98%</b>	<b>4.39</b>	
<b>4) Beliefs about capabilities</b>	I do not have the confidence to select which outcome measures to use with bilingual or multilingual people with aphasia (R)	15 (13.2%)	49 (43%)	20 (17.5%)	15 (13.2%)	7 (6.1%)	8 (7%)	42 (39.6%) *64 (60.4%)	64 (60.4%) *42 (39.6%)	2.52*	2
	I am confident in my ability to conduct outcome measurement with people with aphasia	28 (24.6%)	58 (50.9%)	13 (11.4%)	10 (8.8%)	0 (0%)	5 (4.4%)	23 (21.1%)	86 (78.9%)	3.95	4
	I have found outcome measurement with people with aphasia difficult (R)	4 (3.5%)	38 (33.3%)	20 (17.5%)	37 (32.5%)	11 (9.6%)	4 (3.5%)	68 (61.8%) *42 (38.2%)	42 (38.2%) *68 (61.8%)	3.12*	2
	I have little control over which outcome measures I use with people with aphasia (R)	3 (2.6%)	16 (14%)	22 (19.3%)	39 (34.2%)	29 (25.4%)	5 (4.4%)	90 (82.6%) *19 (17.4%)	19 (17.4%) *90 (82.6%)	3.69*	4
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>34.1%</b>	<b>65.9%</b>	<b>3.32</b>	



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Domain	TDF Survey Statements	Number of participants (%) n=114								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
<b>5) Optimism</b>	I am optimistic that I will be able to conduct outcome measures with people with aphasia in the future	38 (33.3%)	52 (45.6%)	15 (13.2%)	2 (1.8%)	0 (0%)	7 (6.1%)	17 (15.9%)	90 (84.1%)	4.18	4
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>15.9%</b>	<b>84.1%</b>	<b>4.18</b>	
<b>6) Beliefs about consequences</b>	I believe that outcome measurement with people with aphasia is important for therapy planning	48 (42.1%)	51 (44.7%)	9 (7.9%)	1 (0.9%)	1 (0.9%)	4 (3.5%)	11 (10%)	99 (90%)	4.3	4
	I believe that conducting measurement with people with aphasia will improve their motivation for therapy	27 (23.7%)	57 (50%)	21 (18.4%)	3 (2.6%)	2 (1.8%)	4 (3.5%)	26 (23.6%)	84 (76.4%)	3.95	4
	I believe that conducting outcome measurement with people with aphasia allows me to demonstrate the effects of my intervention	36 (31.6%)	58 (50.9%)	8 (7%)	7 (6.1%)	1 (0.9%)	4 (3.5%)	16 (14.5%)	94 (85.5%)	4.1	4
	I believe that outcome measurement with people with aphasia is an effective way to educate patients and their families	33 (28.9%)	58 (50.9%)	15 (13.2%)	2 (1.8%)	2 (1.8%)	4 (3.5%)	19 (17.3%)	91 (82.7%)	4.07	4
	I am doubtful that outcome measurement with people with aphasia will improve patient outcomes (R)	1 (0.9%)	8 (7%)	14 (12.3%)	46 (40.4%)	39 (34.2%)	6 (5.3%)	99 (91.7%) *9 (8.3%)	9 (8.3%) *99 (91.7%)	4.06*	4*
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>14.78%</b>	<b>85.22%</b>	<b>4.1</b>	
		There are incentives at my workplace for conducting	2 (1.8%)	9 (7.9%)	23 (20.2%)	42 (36.8%)	30 (26.3%)	8 (7%)	95 (89.6%)	11 (0.4%)	2.16

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Domain	TDF Survey Statements	Number of participants (%) n=114								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
7) Reinforcement	outcome measurement with people with aphasia										
	Seeing the benefits of outcome measurement with people with aphasia is rewarding	45 (39.5%)	48 (42.1%)	12 (10.5%)	3 (2.6%)	0 (0%)	6 (5.3%)	15 (13.9%)	93 (86.1%)	4.25	4
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>51.4</b>	<b>48.6</b>	<b>3.2</b>
8) Intentions	I always intend to conduct outcome measurement with people with aphasia	31 (27.2%)	63 (55.3%)	10 (8.8%)	4 (3.5%)	2 (1.8%)	4 (3.5%)	16 (14.5%)	94 (85.5%)	4.06	4
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>14.5</b>	<b>85.5</b>	<b>4.06</b>
9) Goals	I am working towards conducting outcome measures with all patients with aphasia.	29 (25.4%)	49 (43%)	16 (14%)	8 (7%)	2 (1.8%)	10 (8.8%)	26 (25%)	78 (75%)	3.91	4
	There are other aspects of my role that are more urgent than conducting outcome measurement with people with aphasia (R)	12 (10.5%)	29 (25.4%)	31 (27.2%)	22 (19.3%)	16 (14%)	4 (3.5%)	69 (62.7%) *41 (37.3%)	41 (37.3%) *69 (62.7%)	3.01*	3
	Outcome measurement with people with aphasia is not a priority for me. (R)	0 (0%)	9 (7.9%)	11 (9.6%)	42 (36.8%)	45 (39.5%)	7 (6.1%)	98 (91.6%) *9 (8.4%)	9 (8.4%) *98 (91.6%)	4.15*	4*
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>23.68</b>	<b>76.32</b>	<b>3.69</b>
10) Memory, attention and decision processes	I have reasons for sometimes not conducting outcome measurement with people with aphasia	9 (7.9%)	58 (50.9%)	15 (13.2%)	19 (16.7%)	8 (7%)	5 (4.4%)	42 (38.5%)	67 (61.5%)	3.38	4
	Outcome measurement with people with aphasia is something I always do as part of my routine	21 (18.4%)	45 (39.5%)	16 (14%)	21 (21.1%)	2 (2.6%)	5 (4.4%)	39 (35.8%)	66 (60.6%)	3.52	4

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Domain	TDF Survey Statements	Number of participants (%) n=114								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
	I sometimes forget to conduct outcome measurement with people with aphasia (R)	6 (5.3%)	31 (27.2%)	20 (17.5%)	30 (26.3%)	19 (16.7%)	8 (7%)	69 (65.1%) *37 (34.9%)	37 (34.9%) *69 (65.1%)	3.24*	2
<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>36.36</b>	<b>63.32</b>	<b>3.38</b>	<b>-</b>
<b>11) Environmental context and resources</b>	I have sufficient access to outcome measures in languages spoken by my clients with aphasia	8 (7%)	21 (18.4%)	22 (19.3%)	44 (38.6%)	13 (11.4%)	6 (5.3%)	79 (73.1%)	29 (26.9%)	2.69	2
	In the organization I work, all necessary resources are available for conducting outcome measures with people with aphasia	13 (11.4%)	40 (35.1%)	20 (17.5%)	26 (22.8%)	9 (7.9%)	6 (5.3%)	55 (50.9%)	53 (49.1%)	3.2	3
	I have insufficient time to conduct outcome measurement with people with aphasia (R)	15 (13.2%)	26 (22.8%)	20 (17.5%)	34 (29.8%)	14 (12.3%)	5 (4.4%)	68 (62.4%) *41 (37.6%)	41 (37.6%) *68 (62.4%)	3.06*	4*
	Other caseload priorities prevent me from conducting outcome measurement with people with aphasia (R)	12 (10.5%)	30 (26.3%)	18 (15.8%)	28 (24.6%)	18 (15.8%)	8 (7%)	64 (60.4%) *42 (39.6%)	42 (39.6%) *64 (60.4%)	2.58*	2*
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>50.35</b>	<b>49.65</b>	<b>2.88</b>
<b>12) Social influences</b>											
	My colleagues are consistently conducting outcome measurement with people with aphasia	10 (8.8%)	33 (28.9%)	24 (21.1%)	32 (28.1%)	11 (9.6%)	4 (3.5%)	67 (60.9%)	43 (39.1%)	2.99	3
	My colleagues in the multidisciplinary or speech pathology team are not supportive of me conducting outcome measurement with people with aphasia (R)	2 (1.8%)	9 (7.9%)	13 (11.4%)	35 (30.7%)	41 (36%)	14 (12.3%)	89 (89%) *11 (11%)	11 (11%) *89 (89%)	4.04*	5

International Aphasia Outcome Measurement

Domain	TDF Survey Statements	Number of participants (%) n=114								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
	Outcome measurement is what patients with aphasia want	6 (5.3%)	29 (25.4%)	55 (48.2%)	14 (12.3%)	6 (5.3%)	4 (3.5%)	75 (68.2%)	35 (31.8%)	3.14	3
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>47.81</b>	<b>52.19</b>	<b>3.39</b>	<b>-</b>
<b>13) Emotion</b>	I do not feel comfortable conducting outcome measurement with people with aphasia (R)	0 (0%)	4 (3.5%)	11 (9.6%)	52 (45.6%)	38 (33.3%)	9 (7.9%)	101 (96.2%) *4 (3.8%)	4 (3.8%) *101 (96.2%)	4.18*	4*
	I like conducting outcome measurement with people with aphasia	27 (23.7%)	55 (48.2%)	22 (19.3%)	5 (4.4%)	0 (0%)	5 (4.4%)	27 (24.8%)	82 (75.2%)	3.95	4
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>14.49</b>	<b>85.51</b>	<b>4.07</b>	<b>-</b>
<b>14) Behavioural regulation</b>	My workplace has strategies for conducting outcome measurement with people with aphasia	14 (12.3%)	33 (28.9%)	20 (17.5%)	33 (28.9%)	8 (7%)	6 (5.3%)	61 (56.5%)	47 (43.5%)	<b>3.11</b>	3
	I have a clear system for checking if I have conducted outcome measurement for each patient with aphasia	10 (8.8%)	32 (28.1%)	23 (20.2%)	36 (31.6%)	7 (6.1%)	6 (5.3%)	66 (61.1%)	42 (38.9%)	3.02	3
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>63.5</b>	<b>44.5</b>	<b>3.07</b>	<b>-</b>

Number of participants selecting each level of agreement with TDF statements for each domain and associated means and medians. 1=strongly disagree; 2=disagree; 3=neither agree nor disagree; 4=agree; 5=strongly agree; (R)=reversed results; <A = Less than agreement (Strongly disagree, Disagree, neither agree nor disagree); A = Agreement (Agree, Strongly Agree). Barrier = ≤3, facilitator = >3

**Supplementary Table 4.** TDF statements and domains with level of agreement, mean and median scores for participants from non-English-speaking countries only

Domain	TDF Survey Statements	Number of participants (%) n=94								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
<b>1) Knowledge</b>	I am familiar with the evidence for outcome measurement with people with aphasia	18 (19.1%)	35 (37.2%)	13 (13.8%)	15 (16%)	0 (0%)	13 (13.8%)	28 (34.6%)	53 (65.4%)	3.69	4
	I do not know which outcome measures to use (R)	3 (3.2%)	9 (9.6%)	14 (14.9%)	29 (30.9%)	23 (24.5%)	16 (17%)	66 *12 (84.6%) (15.4%)	12 *66 (15.4%) (84.6%)	3.77*	3*
	I know what factors to consider when choosing an outcome measure for people with aphasia	22 (23.4%)	44 (46.8%)	8 (8.5%)	4 (4.3%)	3 (3.2%)	13 (13.8%)	15 (18.5%)	66 (81.5%)	3.96	4
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>22.92</b>	<b>77.08</b>	<b>3.8</b>	<b>-</b>
<b>2) Skills</b>	I would benefit from more training in outcome measurement with people with aphasia (R)	25 (26.6%)	27 (28.7%)	26 (27.7%)	3 (3.2%)	0 (0%)	13 (13.8%)	29 *52 (35.8%) (64.2%)	52 *29 (64.2%) (35.8%)	2.09*	2*
	I have prior experience in outcome measurement with people with aphasia	23 (24.5%)	40 (42.6%)	8 (8.5%)	5 (5.3%)	3 (3.2%)	15 (16%)	16 (20.3%)	63 (79.7%)	3.94	4
	I have sufficient training in the use of outcome measures with bilingual or multilingual people with aphasia	4 (4.3%)	11 (11.7%)	17 (18.1%)	27 (28.7%)	21 (22.3%)	14 (14.9%)	65 (81.3%)	15 (18.8%)	2.38	2

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Domain	TDF Survey Statements	Number of participants (%) n=94								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
	I have the skills necessary to align client goals with outcome measures	23 (24.5%)	39 (41.5%)	12 (12.8%)	3 (3.2%)	2 (2.1%)	15 (16%)	17 (21.5%)	62 (78.5%)	3.99	4
<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>47.02</b>	<b>52.98</b>	<b>3.1</b>	<b>-</b>
<b>3) Social/ professional role and identity</b>	Part of my responsibility as a speech pathologist includes outcome measurement with people with aphasia	44 (46.8%)	31 (33%)	5 (5.3%)	0 (0%)	0 (0%)	14 (14.9%)	5 (6.3%)	75 (93.8%)	4.5	5
	Outcome measurement with people with aphasia is not part of my role (R)	2 (2.1%)	1 (1.1%)	6 (6.4%)	9 (9.6%)	61 (64.9%)	15 (16%)	76 (96.2%) *3 (3.8%)	3 (3.8%) *76 (96.2%)	4.6*	4*
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>5.03</b>	<b>94.97</b>	<b>4.55</b>
<b>4) Beliefs about capabilities</b>	I do not have the confidence to select which outcome measures to use with bilingual or multilingual people with aphasia (R)	11 (11.7%)	25 (26.6%)	13 (13.8%)	16 (17%)	16 (17%)	13 (13.8%)	45 (55.6%) *36 (44.5%)	36 (44.5%) *45 (55.6%)	3.01*	3*
	I am confident in my ability to conduct outcome measurement with people with aphasia	24 (25.5%)	40 (42.6%)	11 (11.7%)	5 (5.3%)	0 (0%)	14 (14.9%)	16 (20%)	64 (80%)	4.04	4
	I have found outcome measurement with people with aphasia difficult (R)	4 (4.3%)	17 (81.1%)	15 (16%)	28 (29.8%)	15 (16%)	15 (16%)	58 (73.4%) *21 (26.6%)	21 (26.6%) *58 (73.4%)	3.42*	4*
	I have little control over which outcome measures I use with people with aphasia (R)	4 (4.3%)	9 (9.6%)	12 (12.8%)	24 (25.5%)	27 (28.7%)	18 (19.1%)	63 (82.9%) *13 (17.1%)	13 (17.1%) *63 (82.9%)	3.66*	5*
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>27.22</b>	<b>72.78</b>	<b>3.53</b>
<b>5) Optimism</b>	I am optimistic that I will be able to conduct outcome measures	28	41	7 (7.4%)	3 (3.2%)	0 (0%)	15 (16%)	10 (12.7%)	69 (87.3%)	4.19	4

International Aphasia Outcome Measurement

Domain	TDF Survey Statements	Number of participants (%) n=94								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
	with people with aphasia in the future	(29.8%)	(43.6%)								
<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>12.66</b>	<b>87.34</b>	<b>4.19</b>	<b>-</b>
<b>6) Beliefs about consequences</b>	I believe that outcome measurement with people with aphasia is important for therapy planning	43 (45.7%)	30 (31.9%)	4 (4.3%)	1 (1.1%)	1 (1.1%)	15 (16%)	6 (7.6%)	73 (92.4%)	4.43	5
	I believe that conducting measurement with people with aphasia will improve their motivation for therapy	21 (22.3%)	41 (43.6%)	16 (17%)	3 (3.2%)	0 (0%)	13 (13.8%)	19 (23.5%)	62 (76.5%)	3.99	4
	I believe that conducting outcome measurement with people with aphasia allows me to demonstrate the effects of my intervention	38 (40.4%)	29 (30.9%)	11 (11.7%)	2 (2.1%)	1 (1.1%)	13 (13.8%)	14 (17.3%)	67 (82.7%)	4.25	4
	I believe that outcome measurement with people with aphasia is an effective way to educate patients and their families	23 (24.5%)	39 (41.5%)	14 (14.9%)	3 (3.2%)	1 (1.1%)	14 (14.9%)	18 (22.5%)	62 (77.5%)	4	4
	I am doubtful that outcome measurement with people with aphasia will improve patient outcomes (R)	2 (2.1%)	5 (5.3%)	10 (10.6%)	27 (28.7%)	35 (37.2%)	15 (16%)	72 (91.4%) *7 (8,9%)	7 (8.9%) *72 (91.4%)	4.11*	4*
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>16</b>	<b>84</b>	<b>4.16</b>
<b>7) Reinforcement</b>	There are incentives at my workplace for conducting outcome measurement with people with aphasia	3 (3.2%)	10 (10.6%)	17 (18.1%)	18 (19.1%)	17 (18.1%)	29 (30.9%)	52 (80%)	13 (20%)	2.45	2

## International Aphasia Outcome Measurement

Domain	TDF Survey Statements	Number of participants (%) n=94								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
	Seeing the benefits of outcome measurement with people with aphasia is rewarding	35 (37.2%)	37 (39.4%)	7 (7.4%)	0 (0%)	0 (0%)	15 (16%)	7 (8.9%)	72 (91.1%)	4.35	4
<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>40.97</b>	<b>59/03</b>	<b>3.4</b>	<b>-</b>
<b>8) Intentions</b>	I always intend to conduct outcome measurement with people with aphasia	36 (38.3%)	32 (34%)	9 (9.6%)	3 (3.2%)	0 (0%)	14 (14.9%)	12 (15%)	68 (85%)	4.26	4
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>15</b>	<b>85</b>	<b>4.26</b>
<b>9) Goals</b>	I am working towards conducting outcome measures with all patients with aphasia.	25 (26.6%)	27 (28.7%)	15 (16%)	9 (9.6%)	1 (1.1%)	17 (18.1%)	25 (32.5%)	52 (67.5%)	3.86	4
	There are other aspects of my role that are more urgent than conducting outcome measurement with people with aphasia (R)	8 (8.5%)	18 (19.1%)	21 (22.3%)	23 (24.5%)	11 (11.7%)	13 (13.8%)	55 *26 (67.9%) (32.1%)	26 *55 (32.1%) (67.9%)	3.14	2
	Outcome measurement with people with aphasia is not a priority for me. (R)	0 (0%)	4 (4.3%)	13 (13.8%)	22 (23.4%)	41 (43.6%)	14 (14.9%)	76 *4 (95%) (5%)	4 *76 (5%) (95%)	4.25*	5*
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>23.12</b>	<b>76.89</b>	<b>3.75</b>
<b>10) Memory, attention and decision processes</b>	I have reasons for sometimes not conducting outcome measurement with people with aphasia	5 (5.3%)	39 (41.5%)	13 (13.8%)	14 (14.9%)	8 (8.5%)	15 (16%)	36 (45.6%)	44 (55.7%)	3.24	4
	Outcome measurement with people with aphasia is something I always do as part of my routine	26 (27.7%)	28 (29.8%)	13 (13.8%)	11 (11.7%)	2 (2.1%)	14 (14.9%)	26 (32.5%)	54 (67.5%)	3.81	4



International Aphasia Outcome Measurement

Domain	TDF Survey Statements	Number of participants (%) n=94								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
	I sometimes forget to conduct outcome measurement with people with aphasia (R)	2 (2.1%)	15 (16%)	15 (16%)	19 (20.2%)	28 (29.8%)	15 (16%)	62 (78.5%) *17 (21.5%)	17 (21.5%) *62 (78.5%)	3.71*	5*
<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>33.19</b>	<b>67.23</b>	<b>3.59</b>	<b>-</b>
<b>11) Environmental context and resources</b>	I have sufficient access to outcome measures in languages spoken by my clients with aphasia	5 (5.3%)	21 (22.3%)	15 (16%)	22 (23.4%)	16 (17%)	15 (16%)	53 (67.1%)	26 (32.9%)	2.7	3
	In the organization I work, all necessary resources are available for conducting outcome measures with people with aphasia	13 (13.8%)	13 (13.8%)	17 (18.1%)	16 (17%)	14 (14.9%)	21 (22.3%)	47 (64.4%)	26 (36.6%)	2.93	3
	I have insufficient time to conduct outcome measurement with people with aphasia (R)	4 (4.3%)	22 (23.4%)	18 (19.1%)	24 (25.5%)	12 (12.8%)	14 (14.9%)	54 (67.5%) *26 (32.5%)	26 (32.5%) *54 (67.5%)	3.23*	4*
	Other caseload priorities prevent me from conducting outcome measurement with people with aphasia (R)	4 (4.3%)	15 (16%)	22 (23.4%)	22 (23.4%)	15 (16%)	16 (17%)	59 (75.6%) *19 (24.4%)	19 (24.4%) *59 (75.6%)	3.37*	3
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>								<b>46.77</b>	<b>53.23</b>	<b>3.06</b>
<b>12) Social influences</b>											
	My colleagues are consistently conducting outcome measurement with people with aphasia	8 (8.5%)	16 (17%)	19 (20.2%)	23 (24.5%)	6 (6.4%)	22 (23.4%)	48 (66.7%)	14 (19.4%)	2.96	3
	My colleagues in the multidisciplinary or speech pathology team are not supportive of me conducting outcome	3 (3.2%)	5 (5.3%)	12 (12.8%)	21 (22.3%)	34 (36.2%)	19 (20.2%)	67 (89.3%) *8 (10.7%)	8 (10.7%) *67 (89.3%)	4.04*	5*

International Aphasia Outcome Measurement

Domain	TDF Survey Statements	Number of participants (%) n=94								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
	measurement with people with aphasia (R)										
	Outcome measurement is what patients with aphasia want	7 (7.4%)	22 (23.4%)	38 (40.4%)	12 (12.8%)	2 (2.1%)	13 (13.8%)	52 (64.2%)	29 (35.8%)	3.24	3
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>47.37</b>	<b>48.25</b>	<b>3.41</b>	<b>-</b>
<b>13) Emotion</b>	I do not feel comfortable conducting outcome measurement with people with aphasia (R)	0 (0%)	4 (4.3%)	9 (9.6%)	22 (23.4%)	45 (47.9%)	14 (14.9%)	76 (95%) *4 (5%)	4 (5%) *76 (95%)	4.35*	5*
	I like conducting outcome measurement with people with aphasia	31 (33%)	32 (34%)	14 (14.9%)	2 (2.1%)	0 (0%)	15 (16%)	16 (20.3%)	63 (70.7%)	4.16	4
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>12.58</b>	<b>87.42</b>	<b>4.26</b>	<b>-</b>
<b>14) Behavioural regulation</b>	My workplace has strategies for conducting outcome measurement with people with aphasia	10 (10.6%)	20 (21.3%)	8 (8.5%)	19 (20.2%)	11 (11.7%)	26 (27.7%)	38 (55.9%)	30 (44.1%)	<b>2.99</b>	3
	I have a clear system for checking if I have conducted outcome measurement for each patient with aphasia	14 (14.9%)	20 (21.3%)	13 (13.8%)	23 (24.5%)	7 (7.4%)	17 (18.1%)	43 (55.8%)	34 (44.2%)	2.86*	4*
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>55.86</b>	<b>44.14</b>	<b>2.93</b>	<b>-</b>

Number of participants selecting each level of agreement with TDF statements for each domain and associated means and medians. 1=strongly disagree; 2=disagree; 3=neither agree nor disagree; 4=agree; 5=strongly agree; (R)=reversed results; <A = Less than agreement (Strongly disagree, Disagree, neither agree nor disagree); A = Agreement (Agree, Strongly Agree).  
Barrier = ≤3, facilitator = >3

**Supplementary Table 5.** *Participant countries categorised as English- or non-English-speaking (most-widely spoken language as per Central Intelligence Agency (n.d.))*

<b>English-speaking countries</b>	<b>Non-English-speaking countries</b>
Australia	Austria
Canada	Belgium
Ireland	Chile
New Zealand	Denmark
United Kingdom	France
United States	Finland
	Germany
	Ghana*
	Greece
	India
	Mexico
	Italy
	Norway
	Peru
	Philippines
	Spain
	Sweden
	Switzerland
	Lebanon

\*Countries where English is the official national language and/ or where English is the Lingua Franca (most spoken language) were considered English-speaking- countries except for Ghana. It is acknowledged that the official language for Ghana is English, but Ghana was categorised as non-English-speaking, because English is not necessarily the Lingua Franca, or most commonly language spoken (Department of African, Middle Eastern, and South Asian Languages and Literatures, n.d.). Speech pathologists are therefore likely to practice in a multilingual context in Ghana.

