Communication partner training in traumatic brain injury: A UK survey of Speech and Language Therapists' clinical practice

ABSTRACT

Primary objective: To explore the clinical practice of communication partner training by Speech and Language Therapists for people with traumatic brain injury in the UK.

Study design: Online 97-item survey which addressed the practice of training both familiar and unfamiliar communication partners, and barriers and facilitators to implementation informed by the Theoretical Domains Framework.

Participants: 169 Speech and Language Therapists from private and public settings in the UK.

Results: While 96% reported training familiar communication partners, only 58% reported training unfamiliar communication partners. Therapists reported providing communication partner training consistent with best practice 43% of the time. Evidence-based published programmes were used by 13.8% and 19.9% of participants for training familiar and unfamiliar partners respectively. Therapists reported using outcomes for familiar and unfamiliar communication partners 83% and 78% of the time. The most frequently-reported barrier was lack of behavioural regulation (e.g., planning). Most frequent perceived facilitators were clinicians wanting to deliver communication partner training and that training was part of therapists' professional role (social professional role and identity).

Conclusions: Therapists were motivated to deliver communication partner training but reduced capability affected implementation. Further support to clinicians on outcome measurement with materials to develop workplace systems to monitor implementation are needed.

Keywords: traumatic brain injury, communication partner training, cognitive-communication, rehabilitation, outcome measures, survey

INTRODUCTION

Traumatic brain injury (TBI) results in substantial health-care and societal costs costing the UK economy an estimated £15 billion each year with 1.3 million people living with the consequences of a TBI-related disability (1). Communication impairments are common after TBI with incidence rates commonly above 75% (2). These impairments have a devastating impact on key outcomes such as return to work, and school, family, community and social participation (3-6). Treatments to improve communication skills have tended to focus on approaches predominantly delivered to people with TBI (7). However, communication partners such as families and staff report an unmet need for education, training and support (8, 9) from early post-injury (10, 11) to managing the long-term impact of TBI (12).

Communication partner training (CPT) is consistently identified as a recommendation for Speech and Language Therapists (SLTs) during the rehabilitation process (2, 7, 13). SLTs specialise in working with communication impairments after brain injury, have the ability to help communication partners develop the skills they need to support and facilitate better communication skills in the person with TBI. Communication partners can enhance or inhibit the communication skills of people with TBI (14-16). For example, Shelton and Shryock (17) found that healthcare professionals interacting with people with TBI had more successful conversations when more communication strategies were used. To date, three controlled trials have reported positive outcomes in communication skills from training communication partners (18-20). Two of these trials used the *TBI Express* programme (21) to train paid carers (18) and family members (20). Based on these trials and a comprehensive review of

published evidence and international clinical practice guidelines, an international expert panel of clinicians and researchers recommended the involvement of communication partners in TBI communication rehabilitation (13).

Despite the evidence for training communication partners, studies in the context of SLT practice identify a potential evidence-practice gap. In a sample of 100 SLTs in the US, 73% reported training communication partners in working with people with TBI (22). In that study, 71% reported 'moderate' or 'expert' knowledge in educating people with TBI with their families. However, the paper did not provide details on training content. Watter et al (23) described SLT practice for a group of eight therapists in Australia who reported providing education to families on brain injury, behaviour, cognition and communication. Yet, these services were provided regularly only half the time. Most studies have focused on familiar communication partners (e.g. family members, friends). Less familiar partners such as nurses, rehabilitation staff and support workers also need basic knowledge to build awareness of post-injury impairments and to inform their day-to-day work practices (24-26). In addition, unfamiliar communication partners need strategies and techniques to support communication particularly in helping people to express themselves (27).

There is strong evidence for CPT in another area of acquired brain injury, i.e. aphasia post-stroke. Systematic reviews have shown the positive effect of training (28, 29). These reviews comprise 56 studies and conclude that training communication partners improves their skills in supporting the person with aphasia to communicate. However, there was variation across studies in the elements of training (e.g. education, counseling, direct communication training), nature of feedback given, format (e.g. group, individual or dyad training) and dosage of training. Despite this evidence, researchers have consistently identified an evidence-practice gap for delivering CPT in clinical practice for people with aphasia as well (30-33). In a large study involving 192 SLTs in Sweden, 17% trained families

to use communication strategies (31). A recent survey of CPT practice in stroke conducted with 122 SLTs in Australia reported that most CPT was conducted with familiar (98%) rather than unfamiliar communication partners (66%)(34). In that same study, no more than 13% of SLTs used evidence-based CPT programmes including TBI Express (21) and Supporting Partners of People with Aphasia in Relationships and Communication (SPPARC)(35) for familiar communication partners and Supported Conversation for Adults with Aphasia (36) for unfamiliar communication partners. Only 46% of SLTs perceived that their clinical practice was consistent with best practice. Similar to research studies there is variability in the content and delivery of training by clinicians to both familiar and unfamiliar communications partners, although therapists tend to more commonly train communication strategies to support and facilitate communication in dyads involving the person with aphasia and their familiar communication partner.

Existing evidence provides little information about how SLTs are implementing CPT into clinical practice for people with TBI including the content and delivery of training (22). Moreover, SLT surveys in TBI tend to focus on providing information rather than training communication partners (37, 38). Given the evidence-practice gap in stroke and aphasia it is likely that a similar gap exists in TBI. Methods and models relating to facilitator and barrier identification for healthcare provider actions have developed significantly in recent years and it is generally acknowledged that a theoretical basis enhances the learning from these investigations. The Theoretical Domains Framework (TDF)(39, 40) is a multi-level framework that probes for factors in the wider (social, organisational or community) context and can be used to identify factors that may affect implementation. The initial framework comprised 12 domains (40) which were later refined and validated to 14 domains to explain behaviour change (41). These domains were mapped onto the Behaviour Change Wheel (42) which characterises behaviour in terms of Capability (knowledge; skills; memory, attention

and decision processes; behavioural regulation), Opportunity (social influences; environmental context and resources) and Motivation (social/professional role and identity; beliefs about capabilities; optimism; beliefs about consequences; intentions; goals; reinforcement; emotion)(COM-B system in the Behaviour Change Wheel)(41). Use of the COM-B system may help to understand the TDF domains most important in changing the behaviour of healthcare providers.

The use of implementation frameworks to examine CPT is an emerging field. More broadly in stroke and aphasia, a recent review (43) found only six implementation studies have been published, three in CPT. Few surveys in stroke and aphasia have utilised implementation frameworks to understand the strategies that will help close the evidence-practice gap (34, 44). No studies to date have specifically examined implementation of CPT in TBI. Therefore, the aim of the current study was to survey SLTs working with people with TBI in the UK and identify: (i) what training SLTs provide to familiar and unfamiliar communication partners; and (ii) what barriers and facilitators (informed by the TDF) they perceive to influence implementation of CPT in clinical practice.

METHODS

Design

An online 97-item survey which addressed the practice of training both familiar and unfamiliar communication partners of people with TBI, the type of outcome measures used, and barriers and facilitators to implementation. The dependent variable was the perception of SLTs as to whether their clinical practice was consistent with best practice.

Survey development

The development and reporting of the questionnaire was informed by published guidelines (45), to ensure quality and transparency (see Supplementary Material 1). The items were taken from a previous 99-item survey used in Australia to explore the practices of CPT in stroke and aphasia for SLTs (34). To examine the barriers and facilitators to CPT and what is most important in changing the behaviour of healthcare professionals, questions were adapted from an earlier survey (46) informed by the TDF (40) and linked to the COM-B system (42). Questions and how they link to both frameworks are shown in Table 1 (41).

The research team adapted the survey for the UK context and for cognitive-communication disorders after TBI, and then created it in the web-based platform Qualtrics. To examine accessibility, user experience and presentation of the survey, the survey was piloted with practising SLTs (n=3). Based on feedback, minor changes were made to the survey format and wording of several questions. The final version of the survey contained 97-items (Supplementary materials 2) and covered six areas: (i) participant demographics; (ii) general TBI CPT practice; (iii) CPT for unfamiliar communication partners; (iv) CPT for familiar communication partners; (v) barriers and facilitators; (vi) additional comments. Questions included closed- (e.g. Yes/No, multiple choice, five-point scales: from strongly disagree to strongly agree) and open-ended response formats. There were 29 items across 16 TDF domains (1-3 items each) with Likert scales (0 = strongly disagree to 5 = strongly agree), with reverse scoring for 11 items. Forced-response was applied to ensure that all mandatory questions were answered. Order of the TDF questions was randomised to minimise researcher-related order bias. To maximise a shared understanding among clinicians, definitions were provided for the following three key concepts: (1) communication partner training generally; (2) unfamiliar communication partners; and (3) familiar communication partners. Definitions were provided directly before questions pertaining to that construct (Supplementary materials 2).

150
151 Table 1. Description of COM-B components and TDF domains
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COM-B component (definition)	TDF Domain	Definition	Survey Questions	Example item
Capability (individual's psychological and physical capacity to engage the activity of concern)	Knowledge	An awareness of the existence of something	64, 65, 66	There is strong evidence for communication partner training
	Skills	An ability or proficiency acquired through practice	67, 68	I have had no or limited formal training in providing communication partner training
	Memory, attention and decision processes	The ability to retain information, focus selectively on aspects of the environment and choose between two or more alternatives	81, 82	I routinely provide communication partner training
	Behavioural regulation	Anything aimed at managing or changing objectively observed or measured actions	91, 92	In my workplace, we do not have systems for monitoring whether we provide communication partner training
Opportunity (factors that lie outside the individual that make the behaviour possible or prompt it	Environmental context and resources	Any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behaviour	83, 84	My organisation does not provide me with sufficient resources to provide communication partner training
	Social influences	Those interpersonal processes that can cause individuals to change their thoughts, feelings or behaviours	86, 87	Communication partner training is not routinely conducted by my fellow colleagues
Motivation (those brain processes that energize and direct behaviour)	Social professional role and identity	A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting	69, 70	Providing communication partner training is part of my role

	Beliefs about capabilities	Acceptance of the truth, reality, or validity about an ability, talent of facility that a person can put to constructive use	71, 72	I am confident in providing communication partner training
	Optimism	The confidence that things will happen for the best or that desired goals will be attained	73	I am optimistic that any issues around delivering communication partner training can be solved
	Beliefs about consequences	Acceptance of the truth, reality, or validity about outcomes of a behaviour in a given situation	74, 75	Communication partner training does not always result in the improved ability of communication partners to facilitate communication
	Reinforcement	Increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus	76, 77	I receive recognition in my workplace for providing communication partner training
	Intentions	A conscious decision to perform a behaviour or a resolve to act in a certain way	78	I intend to provide communication partner training in the next three months
	Goals	Mental representation of outcomes or end states that an individual wants to achieve	79, 80	I have a goal to improve my communication partner training practice
	Emotion	A complex reaction pattern, involving experiential, behavioural, and physiological elements by which the individual attempts to deal with a personally significant matter or event	89, 90	I feel stressed at the thought of providing communication partner training
Additional domains not originally mapped to COM-B[a]	Innovation	Any characteristics of the innovation that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behaviour	85	Communication partner training is compatible with my regular clinical practice

	Patient	Any characteristics of the patient that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behaviour	88	When I offer communication partner training, my patients think it will help them

[a]These two domains were not mapped to the COM-B framework as described by Cane et al(41) as they were additional domains later added to the TDF by Huij et al(46)

Participants and Procedure

Participants were qualified SLTs who had worked with at least one person with TBI in the last year. The survey was active during September 2018. An email invitation to participate was sent to administrators of mailing lists of SLTs working with people with TBI (e.g. relevant SLT clinical excellence networks, Royal College of SLTs, rehabilitation groups). Administrators were then asked to forward this email to their mailing lists, using a snowballing method of distribution. Snowballing encourages those who receive the invitation email to forward to further contacts, resulting in the survey being distributed widely. The survey was also distributed at a UK cognitive-communication conference and through social media platforms (e.g., Twitter handles for TBI research). By targeting a variety of platforms, we aimed to capture clinicians working across the continuum of care, in public or private services, and representing a breadth of geographical locations. Those who received the invitation clicked on the survey link if they wished to participate. To encourage ongoing participation, the survey was redistributed half-way through its active period. Researchers had no contact details of potential participants and IP addresses were not recorded to retain anonymity. The study received ethical approval from City, University of London School of Health Sciences Research Ethics Committee (Staff/18-19/10).

Data analysis

Data were exported from Qualtrics into a Microsoft Excel 2007© spreadsheet and screened to identify the following: duplicates, those who declined to participate or were not eligible, incomplete demographics and international entries. The remaining responses to be used for analysis were then downloaded into SPSS 25. Those who fully completed the demographics section but did not continue further were separated and compared to the main sample using either Fisher's Exact test or Chi-square. Descriptive statistics were used to

summarise data for closed-ended responses on participant demographics and CPT practice. To identify barriers and facilitators, we examined the TDF questions at the individual item level to determine the questions with the highest ratings (i.e. facilitators) and lowest ratings (i.e. barriers). We explored empirically whether it was valid to combine the items in TDF domains. We tested internal consistency using Spearman-Brown split-half reliability for 2-item domains (n=11) with a criterion for adequate reliability of coefficient > 0.80 (47) and Cronbach's alpha for 3-item domains (n=1) with adequate reliability coefficients > 0.70 (48). As no domains had adequate internal consistency, the TDF questions were mapped onto the COM-B system to examine the barriers and facilitators to implementation (41). Cronbach's alpha was calculated for each COM-B component (Capability α=0.77; Opportunity α=0.60; Motivation α=0.75).

To explore the main barriers and facilitators to perceived best practice, correlational analysis was conducted between each COM-B component and SLTs' perception as to whether their clinical practice was consistent with best practice. Correlations were rated as small (0.1-0.29), medium (0.30-0.49) or large (>0.5)(49).

Open-format responses were imported into NVivo 11 and analysed using content analysis (50) by the first author. This involved coding and grouping responses into categories and subcategories, informed partly by frequency counts. The coded responses were checked by a second independent qualitative researcher and members of the research team (withdrawn to enable anonymous review) to confirm and verify the analysis. Differences in opinion were resolved through discussion. These results were used to provide context to interpret and elaborate the descriptive and statistical analyses.

RESULTS

Participants

Of the 264 participants who began the survey, four declined participation, 20 discontinued after selecting to participate, 24 did not meet inclusion criteria, and 19 completed the survey but were outside the UK. These participants (n=67) were excluded. Twenty-eight participants completed the demographic questions but did not proceed further. No significant differences were found between these participants (n=28) and those (n=169) included in the analysis in terms of age (p=0.325), sex (p=0.658), years since graduation (p=0.698), years of experience in TBI (p=0.316), percentage of TBI caseload (p=0.767) and primary work setting (p = 0.182). It was not possible to calculate the response rate and source of participants owing to the anonymity of the survey responses, and recruitment strategies employed.

Table 2 provides the demographic profile of participants included in the final analyses. Overall, most participants were female (94.7%) and under 41 years of age (65.1%). Over half of respondents had graduated at least 10 years prior (53.9%) and had 10 years of experience working with TBI (62.1%). There were no significant correlations between these demographic variables (i.e. age, years' post-graduation and years' experience working with TBI) and the dependent variable (i.e. SLTs' perception as to whether their clinical practice was consistent with best practice). Approximately three-quarters of the sample worked in a metropolitan area (76.5%), with almost two-thirds (63.7%) working in public healthcare settings including acute (22%), inpatient rehabilitation (35.5%) and outpatient/community (42.5%). For 42.6% of the sample TBI patients represented over 50% of their caseload, with a spread of participants who had a smaller TBI caseload.

Table 2. Participant demographics (n=169)

Variables	N	%
Age		
20-30 years	49	29%
31-40 years	61	36.1%
41-50 years	40	23.7%
51-60 years	14	8.3%
61-64+ years	4	2.4%
65+	1	0.6%
Sex		
Female	160	94.7%
Male	9	5.3%
Other	0	0%
Number of years since graduation		
Less than 5	53	31.4%
6-10 years	38	22.5%
11-15 years	26	15.4%
16-20 years	18	10.7%
More than 20	34	20.1%
Years of experience working with patients who have had a TBI		
Less than 5	74	43.8%
6-10 years	31	18.3%
11-15 years	25	14.8%
16-20 years	20	11.8%
More than 20 years	19	11.2%
Approximate percentage of my caseload that includes patients who have had a TBI is:		
5% or less	22	13%
6-10%	21	12.4%
11-30%	27	16%
31-50%	27	16%
51-75%	40	23.7%
More than 75%	32	18.9%
Region (able to choose more than one)		
Metropolitan (Urban)	153	76.5%
Rural	40	20%
Remote	7	3.5%
Sector (able to choose more than one)		
Private	66	36.3%
Public	116	63.7%
Setting (able to choose more than one)		
Acute	47	22%
Inpatient rehabilitation	76	35.5%
Outpatient rehabilitation/community	91	42.5%
Predominant setting if selected more than one (which answers are based on)		
Acute	17	44.7%
Inpatient rehabilitation	10	26.3%
Outpatient rehabilitation/community	11	28.9%

Definition of CPT (n=169)

Participants provided a broad description of what CPT involves for them and who is involved, and identified a range of strategies, techniques and reasons for doing CPT. The majority of participants described CPT to involve skills training, educating and provision of

strategies (67%; n=113) with the purpose of creating improved, more positive and meaningful conversational interactions (46%; n=78) which help support a communication partner (30%; n=51). Strategies involved teaching communication partners about TBI and its effects on communication (23%; n=39), communication strengths and weaknesses and dealing with breakdown (24%; n=41) and helping the communication partner adapt their own conversational skills (16%; n=27). Where mentioned, most communication partners were family members and friends (41%, n=70) and carers (17%; n=28). Participants also described the delivery methods and techniques they used (47%; n=79) including groups and individual sessions with or without the person with TBI, and could involve role-play, modelling and feedback with the use of videotaping a key feature (23%, n=39).

Current practice of CPT in TBI:

Full results are shown in Supplementary Material 3. Less than half of respondents 'agreed' or 'strongly agreed' that their current CPT practice was consistent with best clinical practice (42.4%; n=56) (Figure 1). Participants provided CPT to familiar communication partners (42%; n=71), unfamiliar communication partners (4%; n=7) or both (54%; n=91).

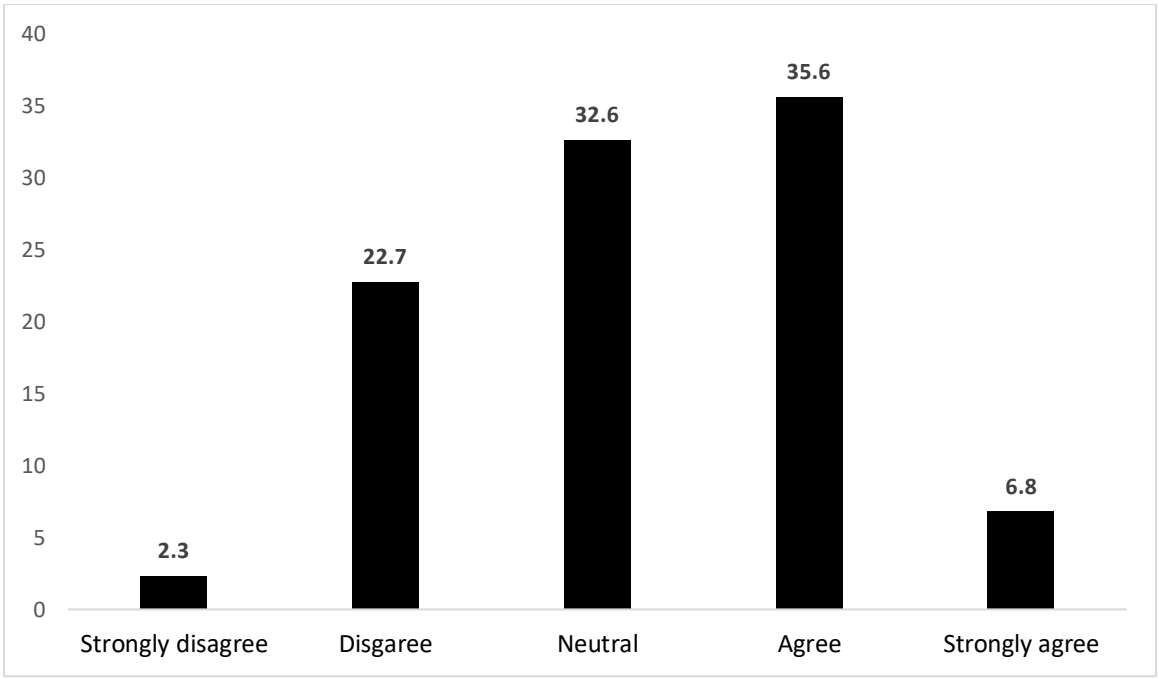

Figure 1. Overall perception of current practice being consistent with best practice (%; n=132)

Unfamiliar CPs

Education approaches (95.4%; n=83) and skills training (87.4%; n=76) were the most common types of CPT. The most common unfamiliar communication partners to whom training was delivered were allied health professionals (87.4%; n=76), nurses (67.8%; n=59) and volunteers (47.1%; n=41). In terms of content, the main topics covered in training included individualised patient-focused communication strategies (86.2%; n=75) and general communication strategies (86.2%; n=75) (Figure 2). Few people used a published programme (13.8%; n=12), with only 3/12 strictly adhering to the specific protocol. The most commonly used programmes were TBI Express (21) (50.0%; n=6), SPPARC (35) (41.7%; n=5) and Total Communication (51) (41.7%; n=5). In terms of methods used in training, main strategies included group discussion (79.3%; n=69) and question-and-answer sessions (79.3%; n=69) (Figure 3). Training was face-to-face (100%; n=87) with some written information (48.3%; n=42), delivered mainly in groups (77.0%; n=67) or one-on-one (63.2%;

n=55), and mainly as requested (58.6%; n=51). Training predominantly involved a single session (43.7%; n=38) of around one hour (41.0%; n=34).

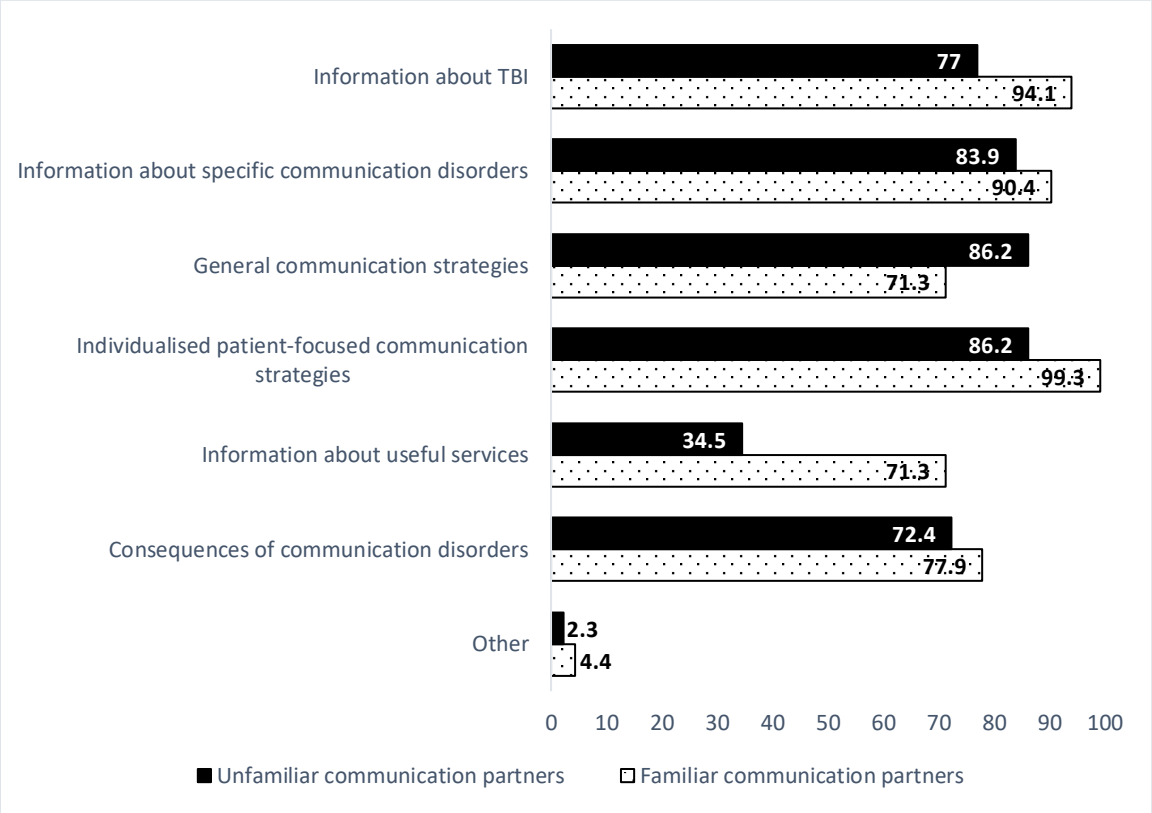

Figure 2. Content of communication partner training sessions (% of participants)

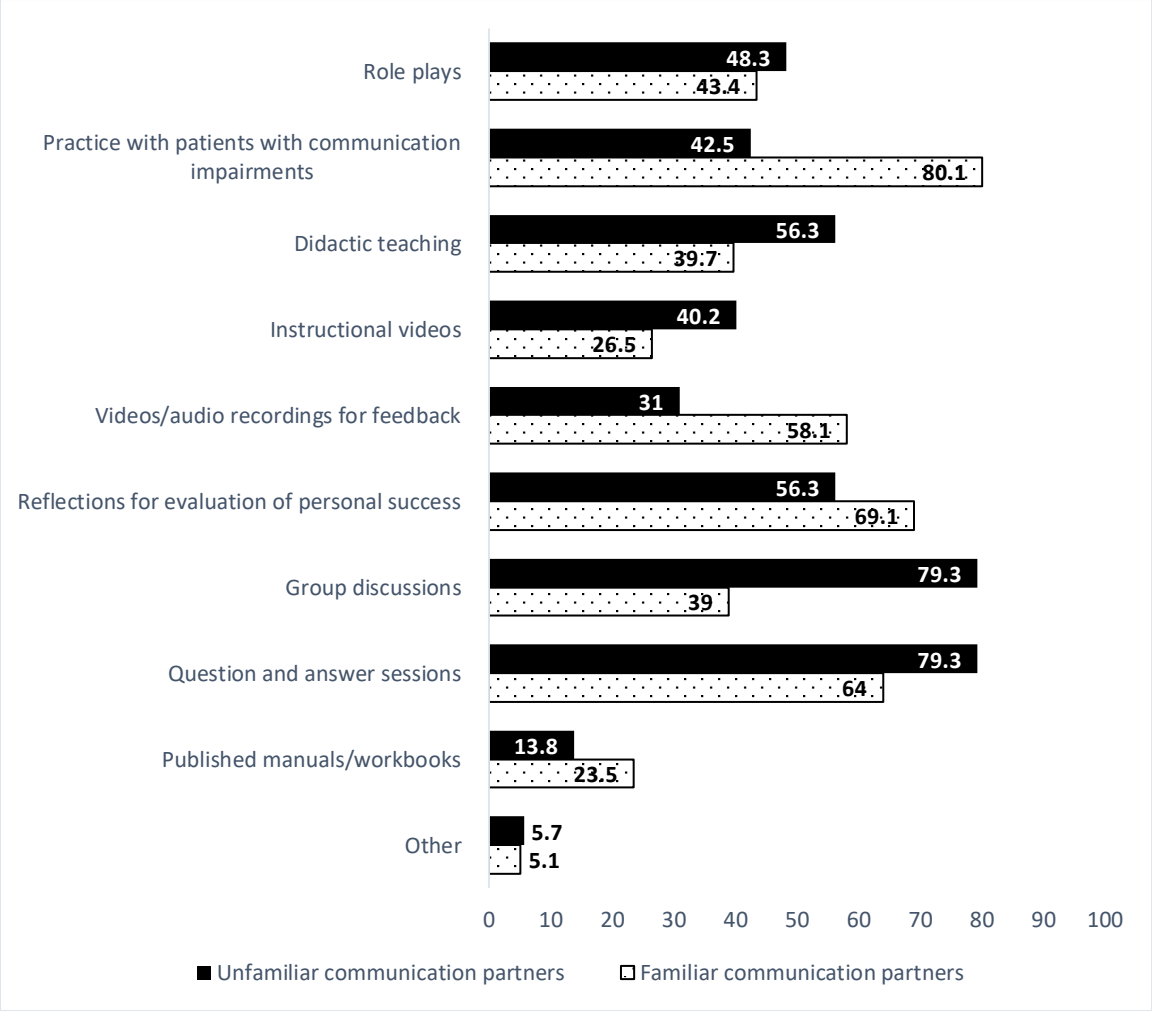

Figure 3. Methods used in communication partner training sessions (% of participants)

Familiar CPs:

Skills training (95.6%; n=130) and education approaches (93.4%; n=127) were the most common types of CPT for familiar communication partners. Training was delivered to mainly spouses/partners (98.5%; n=134), family members (94.1%; n=128) and friends (56.6%; n=77). Content included individualised patient-focused communication strategies (99.3%; n=135) (Figure 2). A small proportion of people used published programmes (19.9%; n=27), with only 1/27 strictly adhering to the protocol. The most commonly used programmes were SPPARC (66.7%; n=18) and TBI Express (59.3%; n=16). The main methods used were practice with patients with communication impairments (80.1%; n=109)

and reflection of personal success (69.1%; n=94) (Figure 3). Training was delivered face-to-face (100%; n=136) with some written information (52.2%; n=71), delivered mainly to the communication partner with the patient (95.6%; n=130) or one-to-one (69.1%; n=94). Training was delivered by therapists to about 50% or more of their TBI caseload (76.5%; n=104). A third of respondents (33.8%; n=46) provided two sessions of training; 25.7% (n=35) indicated 'other' and their majority (n=30) reported that the number of sessions was tailored to the needs of the person with TBI and their communication partner. The sessions were about 30-45 minutes long (33.6%; n=44) or an hour (50.4%; n=66).

Outcomes

One hundred and thirty-one (96%) of those working with familiar communication partners and 82 (94%) of those working with unfamiliar communication partners responded to open-ended questions about the outcomes they used to measure the effect of CPT (Figure 4). The most commonly used were informal measures such as self-rating scales or checklists for both familiar (46.6%; n=61) and unfamiliar communication partners (47.6%; n=39). Participants also used more formal outcome measures for familiar (40.5%; n=53) and unfamiliar communication partners (14.6%; n=12). Most regularly used were outcomes of perceived communicative ability i.e. La Trobe Communication Questionnaire (52); conversation participation i.e. Adapted Kagan Scales (53), Conversation Analysis Profile for People with Aphasia (CAPPA)(54), Conversation Analysis Profile for People with Cognitive Impairments (CAPPCI)(55); and a therapy outcome across impairment, activity, participation and well-being i.e. Therapy Outcome Measures (TOMs)(56). No outcomes were used by 13.7% of participants (n=22) for familiar communication partners and 22% of participants (n=18) for unfamiliar communication partners.

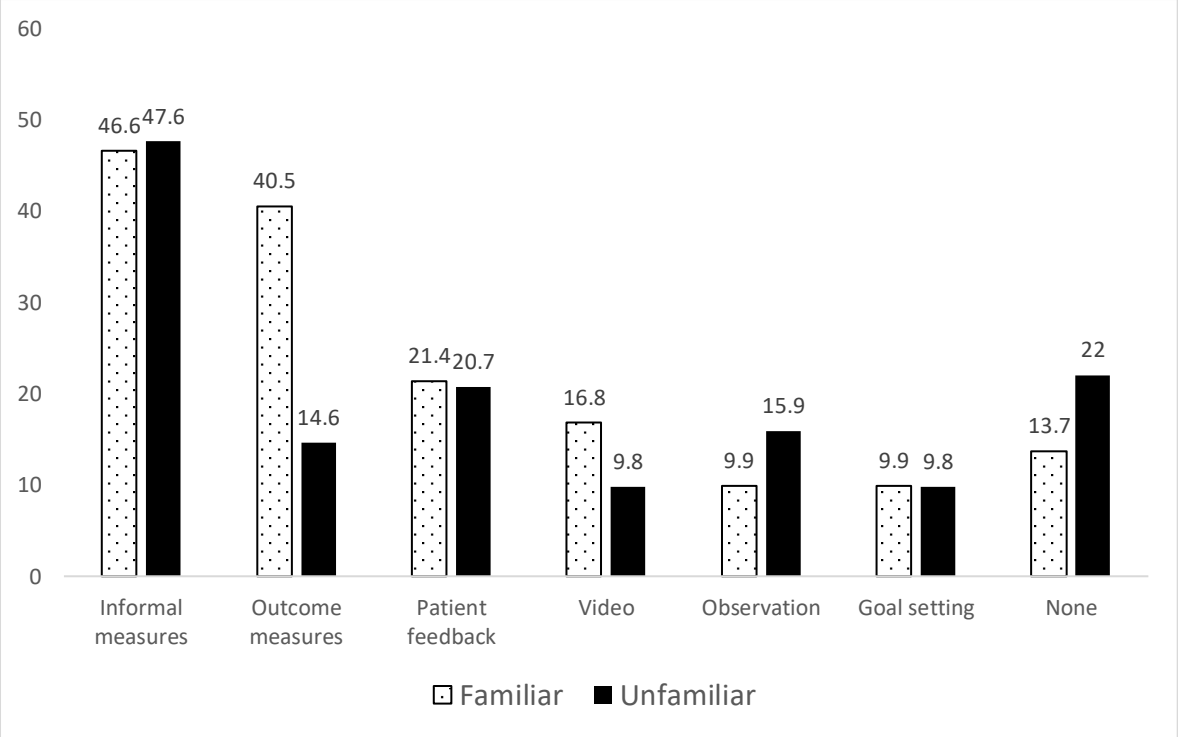

Figure 4. Qualitative open-ended responses relating to outcome measures used (% of participants).

Factors perceived to influence practice of CPT

The means and standard deviations for each barrier and facilitator question are presented in Supplementary Materials 4. Items with the highest (i.e. facilitators) and lowest ratings (i.e. barriers) are shown in Table 3. Most participants agreed, or strongly agreed, that: CPT is part of my professional role; providing training is rewarding; training would help patients communicate more successfully; and they intend to provide CPT in the next 3 months. The open-ended responses described a range of facilitators including 'motivated clients with supportive partners who are keen to engage in the training' (33%), 'good understanding of CPT within the SLT team and well-understood by the wider multidisciplinary team' (30%), access to treatment resources and physical space to do training (28%), 'sufficient staffing' (27%) and 'feeling confident on what/how I am training and my own knowledge and skills' (19%).

Most participants disagreed, or strongly disagreed, that they had adequate formal training in CPT, that training improves the skills of the communication partner, that the workplace facilitates the use of CPT or that there are systems for monitoring the implementation of the training. The open-ended responses to barriers revealed that the main barriers were lack of time, resources and staffing (70%). Other barriers were somewhat consistent with low-rated questions including comments about 'lack of experience, lack of training, only occasional work with TBI patients' (58%), belief that patients and/or communication partners don't see training as a priority (37%), 'limited access to full range of conversations partners within working hours' (30%), and 'hospital managers do not see this as part of the SLT role/do not provide an opportunity for SLTs to be able to provide this' (11%).

Table 3. Questions rated most as facilitators (highest mean score) and barriers (lowest mean score) as mapped onto the TDF domains and COM-B components

Facilitators			Barriers		
Item content	TDF Domain	COM-B component	Item content	TDF Domain	COM-B component
CPT is part of my role	Social professional role and identity	Motivation	There are no systems for monitoring whether we provide CPT	Behavioural regulation	Capability
I believe that patients will be able to communicate more successfully following CPT	Belief about consequences	Motivation	There are no policies/procedures in my workplace to facilitate CPT being provided	Behavioural regulation	Capability
Providing CPT is rewarding for me.	Emotion	Motivation	CPT does not always improve the skills of the communication partner	Belief about consequences	Motivation
I intend to provide CPT in the next three months	Intentions	Motivation	Lack of formal training in providing CPT	Skills	Capability

To further explore the main barriers and facilitators, questions were mapped onto the three COM-B components which were correlated with SLTs' perception as to whether their clinical practice was consistent with best practice. A strong positive correlation was found between whether participants perceived their CPT to be consistent with best practice and capability ($r=0.54$, $n=132$, $p<0.001$) and a moderate correlation with motivation ($r=0.42$, $n=132$, $p<0.001$) and opportunity ($r=0.30$, $n=132$, $p<0.001$).

DISCUSSION

This study aimed to describe the clinical practice of SLTs in the UK on CPT for people with TBI. While CPT practice has been examined in other fields, most notably stroke, to our knowledge this is the first survey to focus on CPT for people with TBI. Our findings should generalise well to UK SLT practice. The sample size was higher than for other surveys in TBI (22, 37, 38) and for CPT in stroke (30, 32, 34). The sample was also representative of SLTs in the UK with participants working mainly in metropolitan areas, in the public health sector, and across a range of settings including acute, inpatient rehabilitation and outpatient/community. The sample contained participants with a range of years' experience since graduation and in working with people with TBI, with a range of people with TBI on their caseload.

Familiar communication partners were trained more often than unfamiliar communication partners consistent with surveys of CPT in stroke (34) and related areas in TBI (37). However, training was not routinely offered. The types of CPT provided were consistent with SLT practice in stroke, involving education and skills training (34), and teaching individualised communication strategies to communication partners as a key topic (30-32, 34). Unfamiliar communication partners were taught general communication strategies which is expected given they communicate with people who have a range of

neurological conditions (e.g. stroke, TBI, dementia). Commonly used strategies identified for people with neurological conditions (15) and in CPT programmes (57) may prove a useful starting point for teaching. Education to communication partners is common in other TBI studies (22, 37, 38) particularly in the sub-acute and post-discharge phase from hospital (37) and in the early months post-injury (58) which may suggest the optimal time to educate communication partners.

Methods used for training communication partners were more active (e.g. role-play, practice conversation) than passive (e.g. instructional video's). This is consistent with models of adult learning theory (59). As the effectiveness of using passive teaching strategies is unclear (29), the pursuit of more active strategies during training is likely warranted.

Published evidence-based programmes were used less than 20% of the time with most participants adapting them or using the programmes as a rough guide only. The infrequent use of published programmes is not uncommon; it has been frequently reported in other SLT surveys (30, 32, 34); and highlights a problem with putting evidence into practice. It may be related to the practical constraints of a clinical service; or it may link to therapists individualising programmes to accommodate a range of impairments. As a result, it leads to considerable variability in the amount of information given (57) and raises concerns about training effectiveness. The limited dose of training was consistent with reports elsewhere (32). However, existing CPT studies vary in the amount of training required (18, 20, 60), so further research on the optimal dosage of training is needed.

There was a diverse range of approaches used to measure outcomes. A substantial proportion of participants did not use any outcomes which has implications for demonstrating the effect of an intervention. Informal scales and self-ratings were most commonly used, consistent with studies in stroke (30-32). However, there was a discrepancy in the use of outcomes of communication/conversation, which tended to be used more with familiar

communication partners. It is possible that as more sessions are spent training familiar communication partners, there is a greater amount of time devoted to measuring outcomes.

Overall, measuring outcomes in CPT is complex. Outcomes need to encapsulate improved knowledge, behaviour, feelings or attitudes of both people with TBI *and* their communication partners (61). The objectives of training should be aligned with intervention aims and desired outcomes with consideration of both long and short-term outcomes (61). Formal assessment is used little in stroke perhaps due to the wide range of outcomes available, making the choice difficult (30, 32, 61). There is greater consensus of outcomes in TBI as fewer measures exist, however Steel and Togher (62) highlighted that access can be challenging and further clinical feasibility research is needed. A more consistent use of outcomes is likely to contribute to increased implementation of CPT.

While many SLTs reported that their clinical practice was consistent with best practice, close to 60% of therapists did not share this view. Therefore, understanding what influences delivery of evidence-based CPT in clinical practice is important to ensuring best practice is implemented. Encouragingly, SLTs perceived CPT to be part of their role, with positive emotions and clear intention to deliver training in the short-term consistent with other surveys examining implementation facilitators (34, 63). Therapists also believed that training would improve the communicative ability of people with TBI but not that of the communication partner. This may reflect a lack of knowledge of the evidence-base, fewer outcomes being used to assess communication partners' skills or limited access to communication partners due to problems with availability or readiness to engage (31-33). These factors relate to a therapist's motivation (of the COM-B model). Proposed interventions to further improve implementation include persuasive communication and information provision to increase therapists' knowledge and beliefs about the positive consequences of communication partner training (42).

Barriers surrounding the workplace and lack of skills affected implementation. Workplace barriers including lack of time, staffing and resources have consistently been reported (31, 34, 37). Interventions directed at communication partners are not prioritised as routine in clinical practice (31). A lack of skills, knowledge and training in delivering CPT was also reported, which is related to capability (of the COM-B model). Therapists have previously been shown to lack knowledge and confidence in the use of current evidence, with clinical decisions based mainly on clinical experience and patient preferences (22). Interventions that may help to increase capability include education, training and enablement to reduce barriers (42). In the UK, such interventions should occur early as part of speech and language therapy training programmes to improve knowledge of CPT. Later, more comprehensive opportunities that include enablement to reduce practice barriers should also be considered (e.g. external courses, work-based training programmes, online training). In addition, access to evidence can be challenging for therapists so making evidence-based resources and training easily accessible and timely (including the use of online materials) with support materials (e.g. structured planning tools) to address service planning should be a future priority.

Limitations of the study are linked to the survey methodology used. The survey was opened for one month only and more responses may have been obtained from providing a wider window for participation. Only therapists interested in CPT may have self-selected and may not be typical of SLTs generally. While they may have been more inclined to provide positive responses to questions, information about implementation barriers suggest that this was not the case. The survey was also long (97-items) and may have affected respondent burden which could explain why not all therapists answered all the questions. Despite this, 169 participants completed the survey, making it the largest survey on the topic to date and increasing our confidence on the generalizability of the results.

CONCLUSION

This study identified a significant evidence-practice gap in the area of CPT for people with TBI in the UK. There was variability in the delivery of CPT to familiar and unfamiliar communication partners including type of training provided, training content, use of evidence-based published programmes and use of outcome measures. Therapists were motivated to deliver CPT but reduced capability affected implementation. By introducing and adapting existing interventions that address the barriers, uptake of CPT for people with TBI has the potential to be implemented to a greater extent.

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SUPPLEMENTARY MATERIAL 1: Checklist for web-based survey design and reporting(45)

Item category	Checklist item	Y/N	Comments
Design	Describe survey design	Y	Target population as described in method section. Convenience sample.
Institutional Review Board (IRB) approval and informed consent process	IRB approval	Y	From City, University of London Ethics Committee
	Informed consent	Y	Participant information was presented in the initial survey distribution email
	Data protection	Y	Only the research team has access to password-protected data on Qualtrics.
Development and pre-testing	Development and testing	Y	As described in method section.
Recruitment process and description of the sample having access to the questionnaire	Open survey vs closed survey	Y	Open survey
	Contact mode	Y	Initial contact with potential participants was made via electronic and social media (e.g., mailing lists, Twitter, websites) of research teams and targeted organisations, as described in method section.
	Advertising the survey	Y	
Survey administration	Web/E-mail	Y	Web
	Context	Y	Organisations for speech and language therapists working in TBI rehabilitation, as described in method section.
	Mandatory/voluntary	Y	Voluntary
	Incentives	Y	Nil financial incentives offered. One-page summary of research results offered if email address was provided. All participants also notified of https://blogs.city.ac.uk/punt/research/ where a summary will be provided when complete.
	Time/Date	Y	31/08/2018 – 31/09/2018
	Randomisation of items or questionnaires	Y	Items in the section on barriers and facilitators were randomised for each participant, to prevent order bias.
	Number of items	Y	97 items
	Number of screens (pages)	Y	9 pages
	Completeness check	Y	Forced-response feature selected on Qualtrics
	Review step	N	Respondents were not allowed to review and change their answers as respondents were asked to provide their own definitions before being given the definitions in subsequent parts of the survey.
Response rate	Unique site visitor	N	Collection of IP addresses and cookies were disabled to protect anonymity of respondents.
	View rate (Ratio of unique survey visitors/ unique site visitors)	N	
	Participation rate (Ratio of unique visitors who agreed to participate/ unique first survey page visitors)	N	
	Completion rate (Ratio of users who finished the survey/users who agreed to participate)	Y	132/264 x 100% = 50%
Preventing multiple entries	Cookies used	N	Cookies were not used to assign unique user identifier in light that some participants may drop out and want to start a survey again. To avoid inclusion of duplicate entries from same

from the same individuals			respondents, responses provided in demographic section were screened to identify duplicates.
	IP check	N	IP addresses were not recorded to protect anonymity of respondents.
	Log file analysis	N	
	Registration	N	Open survey was used
Analysis	Handling of incomplete questionnaires	Y	Surveys terminated after demographic section was included in final analysis with completed surveys. Only survey that terminated before completing demographic section was excluded.
	Questionnaires submitted with an atypical timestamp	N	
	Statistical correction	N	None as representative sample collected.

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SUPPLEMENTARY MATERIAL 2:

Final version of survey of Communication Partner Training (CPT) for Traumatic Brain Injury (TBI)

This survey has been designed to investigate what Speech and Language Therapists (SLTs) are currently doing in clinical practice to support people with traumatic brain injury (TBI) and their communication partners. Your views will help to influence change by helping us to understand the barriers and facilitators to undertaking communication partner training; to identify the key components of training; and how they address the needs of people with TBI, their communication partners and clinicians. Your views will also help us to design future research studies focused on communication partner training for people with TBI. Thank you very much for your participation.

1) PARTICIPANT DEMOGRAPHICS

No.	Question	Answer
1	Participant Information Statement	I wish to participate I do NOT wish to participate [skip to end of survey if selected]
2	I am a speech and language therapist who: (a) has worked with at least one client in the last year who had a TBI; and (b) has worked in an acute, inpatient rehabilitation, outpatient hospital setting, or community/private setting.	If yes to all two points, please click here to continue. If no, please click here. [skip to end of survey if selected]
3	My age is:	20-30 years 31-40 years 41-50 years 51-60 years 61-64 years 65+years
4	I identify as:	Female Male Other
5	The number of years since I graduated is:	5 years or less 6-10 years 11-15 years 16-20 years More than 20 years

6	My total number of years of experience working with patients who have had a TBI is:	5 years or less 6-10 years 11-15 years 16-20 years More than 20 years
7	In my current role/most recent previous role in which I worked with people with TBI, the approximate percentage of my caseload that includes patients who have had a TBI is:	5% or less 6-10% 11-30% 31-50% 51-75% More than 75%
8	List the country (and if in the UK, the county) you currently work in (e.g. East Sussex, UK):	Open-ended
9	The region I currently work in is (select all that apply):	Metropolitan (Urban) Rural Remote
10	I work in (select all that apply):	Private healthcare sector Public healthcare sector
11	I work in (select all that apply):	Acute hospital setting Inpatient rehabilitation hospital setting Outpatient hospital setting or community setting
12	[Display this question if more than one option is selected in previous question] In the previous question, you have indicated that you work in multiple settings. Please select the setting that you predominantly work in OR the setting that you would like to base your answers on for this survey.	Acute hospital setting Inpatient rehabilitation hospital setting Outpatient hospital setting or community setting

2) GENERAL TBI COMMUNICATION PARTNER TRAINING (CPT) PRACTICE

No.	Question	Answer
13	What is your understanding of communication partner training and what it involves?	Open-ended
Preamble	Communication partner training is defined in the literature as an intervention that is both: - Directed at people other than the person with a communication impairment, AND - Delivered with the aim of improving the impairment, communication, participation, and/or wellbeing of the person with the communication impairment	na

	In the literature, communication partner training has been divided into two distinct categories: - Communication partner training provided to **unfamiliar communication partners** (e.g. healthcare workers, service providers, and retail employees), and - Communication partner training provided to **familiar communication partners** (e.g. friends, family, and colleagues)	
14	I provide communication partner training to (select all that apply):	<table><tr><td></td><td>Familiar CPs</td><td>Unfamiliar CPs</td></tr><tr><td>People with cognitive-communication impairments</td><td></td><td></td></tr></table>
15	[Display this question if 'unfamiliar communication partners' is empty in Q14] In the previous question, you have indicated that you do **not** provide communication partner training to **unfamiliar** communication partners, why is that so?	Open-ended
16	[Display this question if 'familiar communication partners' is empty in Q14] In the previous question, you have indicated that you do **not** provide communication partner training to **familiar** communication partners, why is that so?	Open-ended

3) CPT PRACTICE FOR UNFAMILIAR CPS [Display this section if 'unfamiliar communication partners' selected in question 19]

No.	Question	Answer
Preamble	In the previous section, you answered that you provide communication partner training to unfamiliar communication partners. The following questions are related to unfamiliar communication partner training. As a reminder, unfamiliar communication partners are people who might interact with and are not personally familiar with the person with communication impairments. Some examples include healthcare professionals and volunteers.	na
17	According to Simmons-Mackie, communication partner training can fit into three categories: - Communication skills training: training the partner to use strategies or resources to support and facilitate the communication of the person with a communication difficulty - Educational programs: increasing communication partner's knowledge of communication, communication deficits, and related issues	Skills training Education Counselling

	- Counselling programs: explicit attention to psychosocial consequences of communication impairment and disability, such as dealing with depression, anxiety, or feelings of isolation. My predominant approach in providing communication partner training to unfamiliar communication partners includes (select all that apply):	
18	The unfamiliar communication partners I provide communication partner training to are (select all that apply):	Medical doctors Nurses Allied health professionals Patient Services Assistants Food service staff Administrative staff Volunteers Other
19	[Display this question if 'other' is selected in previous question] Please specify if 'other':	Open-ended
20	The communication partner training I provide to unfamiliar communication partners typically covers the following topics (select all that apply):	Information about TBI Information about specific communication disorders General communication strategies that work for anyone with the disorder Individualised tailored communication strategies to help the specific patient communicate Information about useful services Consequences of communication disorders Other
21	[Display this question if 'other' is selected in previous question] Please specify if 'other':	Open-ended
22	The communication partner training I provide to unfamiliar communication partners typically involves the following teaching strategies (select all that apply):	Role plays Practice with patients with communication impairments Didactic teaching Instructional videos Video/audio recordings for feedback Reflections for evaluation of personal success Group discussions Question and answer sessions

		Published manuals/workbooks Other
23	[Display this question if 'other' is selected in previous question] Please specify if 'other':	Open-ended
24	I have used a published communication partner training program when delivering communication partner training to unfamiliar communication partners in the last 12 months.	Yes No
25	[Display this question if 'yes' is selected in previous question] The published communication partner training program I have used when delivering communication partner training to unfamiliar communication partners in the last 12 months is (select all that apply):	TBI Express (Togher et al., 2010) Supported Conversation for Adults with Aphasia (SCATM; Kagan et al., 2001) Patient-Centred Communication Intervention (PCCI; McGilton et al., 2010) Connect's Conversation Partner Scheme (CPS; McVicker et al., 2009) Total Communication (Rautakoski, 2011) Supporting Partners of People with Aphasia in Relationships & Communication (SPPARC; Lock et al., 2001) Couples Therapy (Boles, 2009) Communication Therapy for People with Aphasia and their Partners (APPUTE; Nykänen et al., 2013) Conversational coaching (Hopper et al., 2002) MESSAGE (Smith et al., 2011) Other
26	[Display this question if 'other' is selected in previous question] Please specify if 'other':	Open-ended
27	[Display this question if 'yes' is selected for 'I have used a published communication partner training program when delivering communication partner training to unfamiliar communication partners in the last 12 months.'] When using a published communication partner training program with unfamiliar communication partners, I will:	Strictly follow the protocol Follow the protocol, but adapt it as needed Use the protocol as a rough guide only
28	[Display this question if 'follow the protocol, but adapt it as needed' or 'use the protocol as a rough guide only' is selected in Q28] How do you adapt the protocol and/or what sections do you use most?	Open-ended
29	The communication partner training I provide to unfamiliar communication partners typically involves the following delivery methods (select all that apply):	Face-to-face Written

		Online
30	The communication partner training I provide to unfamiliar communication partners typically involves the following delivery formats (select all that apply):	Group Patient with communication impairment and his/her communication partner One-to-one
31	I provide communication partner training to unfamiliar communication partners:	Once a year Twice a year Monthly As requested Other
32	[Display this question if 'other' is selected in previous question] Please specify if 'other':	Open-ended
33	[Display this question if 'as requested' is selected in previous question] Please specify if 'as requested':	Open-ended
34	For each unfamiliar communication partner, the number of sessions of communication partner training I usually provide is:	1 session 2 sessions 3 sessions 4 sessions Other
35	[Display this question if 'other' is selected in previous question] Please specify if 'other':	Open-ended
36	The average length of each session of communication partner training I provide for unfamiliar communication partners is:	Less than 30 minutes About 30-45 minutes About 1 hour About 2 hours About 3 hours More than 3 hours
37	[Display this question if 'more than 3 hours' is selected in previous question] Please specify if 'more than 3 hours':	Open-ended
38	In my workplace, communication partner training for unfamiliar communication partners is usually delivered by (select all that apply):	Me, the speech and language therapist A therapy assistant/ allied health assistant Volunteer Other
39	[Display this question if 'other' is selected in previous question]	Open-ended

	Please specify if 'other':	
40	What assessments or measures do you use to assess communication partner training for people with TBI?	Open-ended

4) CPT PRACTICE FOR FAMILIAR CPS [Display this section only if 'familiar communication partners' selected in question 16]

No.	Question	Answer
Preamble	In one of the previous sections, you answered that you provide communication partner training to familiar communication partners. The following questions are related to familiar communication partner training. As a reminder, familiar communication partners are people who might interact with and are personally familiar with the person with communication impairments. Some examples include family members and friends.	na
41	According to Simmons-Mackie, communication partner training can fit into three categories: - Communication skills training: training the partner to use strategies or resources to support and facilitate the communication of the person with a communication difficulty - Educational programs: increasing communication partner's knowledge of communication, communication deficits, and related issues - Counselling programs: explicit attention to psychosocial consequences of communication impairment and disability, such as dealing with depression, anxiety, or feelings of isolation. My predominant approach in providing communication partner training to familiar communication partners includes (select all that apply):	Skills training Education Counselling
42	The familiar communication partners I provide communication partner training to are (select all that apply):	Spouses/Partners Family members Friends Employers/Colleagues Community members Other

43	[Display this question if 'other' is selected in previous question] Please specify if 'other':	Open-ended
44	The communication partner training I provide to familiar communication partners typically covers the following topics (select all that apply):	Information about TBI Information about specific communication disorders General communication strategies that work for anyone with the disorder Individualised tailored communication strategies to help the specific patient communicate Information about useful services Consequences of communication disorders Other
45	[Display this question if 'other' is selected in previous question] Please specify if 'other':	Open-ended
46	The communication partner training I provide to familiar communication partners typically involves the following teaching strategies (select all that apply):	Role plays Practice with patients with communication impairments Didactic teaching Instructional videos Video/audio recordings for feedback Reflections for evaluation of personal success Group discussions Question and answer sessions Published manuals/workbooks Other
47	[Display this question if 'other' is selected in previous question] Please specify if 'other':	Open-ended
48	I have used a published communication partner training program when delivering communication partner training to unfamiliar communication partners in the last 12 months.	Yes No
49	[Display this question if 'yes' is selected in previous question] The published communication partner training program I have used when delivering communication partner training to familiar communication partners in the last 12 months is (select all that apply):	TBI Express (Togher et al., 2010) Total Communication (Rautakoski, 2011) Supported Conversation for Adults with Aphasia (SCATM; Kagan et al., 2001) Couples Therapy (Boles, 2009)

		Communication Therapy for People with Aphasia and their Partners (APPUTE; Nykänen et al., 2013) Supporting Partners of People with Aphasia in Relationships & Communication (the assessment part) (SPPARC; Lock et al., 2001) Conversational coaching (Hopper et al., 2002) Patient-Centred Communication Intervention (PCCI; McGilton et al., 2010) Connect's Conversation Partner Scheme (CPS; McVicker et al., 2009) MESSAGE (Smith et al., 2011) Other
50	[Display this question if 'other' is selected in previous question] Please specify if 'other':	Open-ended
51	[Display this question if 'yes' is selected for 'I have used a published communication partner training program when delivering communication partner training to familiar communication partners in the last 12 months.'] When using a published communication partner training program with familiar communication partners, I will:	Strictly follow the protocol Follow the protocol, but adapt it as needed Use the protocol as a rough guide only
52	[Display this question if 'follow the protocol, but adapt it as needed' or 'use the protocol as a rough guide only' is selected in Q51] How do you adapt the protocol and/or what sections do you use most?	Open-ended
53	The communication partner training I provide to familiar communication partners typically involves the following delivery methods (select all that apply):	Face-to-face Written Online
54	The communication partner training I provide to familiar communication partners typically involves the following delivery formats (select all that apply):	Group Patient with communication impairment and his/her communication partner One-to-one
55	I provide communication partner training to familiar communication partners at the following frequency:	Usually (with about 90% of my patients) Frequently (with about 70% of my patients) Sometimes (with about 50% of my patients) Occasionally (with about 30% of my patients) Rarely (with about 10% of my patients)
56	Any additional comments about frequency:	Open-ended

57	For each familiar communication partner, the number of sessions of communication partner training I usually provide is:	1 session 2 sessions 3 sessions 4 sessions Other
58	[Display this question if 'other' is selected in previous question] Please specify if 'other':	Open-ended
59	The average length of each session of communication partner training I provide for familiar communication partners is:	Less than 30 minutes About 30-45 minutes About 1 hour About 2 hours About 3 hours More than 3 hours
60	[Display this question if 'more than 3 hours' is selected in previous question] Please specify if 'more than 3 hours':	Open-ended
61	In my workplace, communication partner training for familiar communication partners is usually delivered by (select all that apply):	Me, the speech and language therapist A therapy assistant/ allied health assistant Volunteer Other
62	[Display this question if 'other' is selected in previous question] Please specify if 'other':	Open-ended
63	What assessments or measures do you use to assess communication partner training for people with TBI?	Open-ended

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5) BARRIERS AND FACILITATORS

Domains	No.	Question	Answer
	Preamble	Please read each statement carefully.	na
Knowledge	64	There is strong evidence for communication partner training.	

An awareness of the existence of something	65	I know how to deliver communication partner training as per the recommendation.	Strongly agree Agree Neutral Disagree Strongly disagree
	66	In my work with communication partner training, I know exactly what is expected from me.	
Skills *An ability or proficiency acquired through practice*	67	I have had no or limited formal training in providing communication partner training.	
	68	I have the skills to provide communication partner training.	
Social professional role and identity *A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting*	69	Providing communication partner training is part of my role.	
	70	Others in my workplace do not recognise providing communication partner training as part of my role.	
Beliefs about capabilities *Acceptance of the truth, reality, or validity about an ability, talent or facility that a person*	71	I am confident in providing communication partner training.	
	72	I do not have control over the provision of communication partner training in my workplace.	
Optimism *The confidence that things will happen for the best or that desired goals will be attained*	73	I am optimistic that any issues around delivering communication partner training can be solved.	
Beliefs about consequences *Acceptance of the truth, reality, or validity about outcomes of a behaviour in a given situation*	74	Communication partner training does not always result in the improved ability of communication partners to facilitate communication.	
	75	If I deliver communication partner training, I believe that patients with communication impairments will be able to communicate more successfully.	
Reinforcement *Increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus*	76	I receive recognition in my workplace for providing communication partner training.	
	77	There is no encouragement given to me to provide communication partner training in my workplace.	
Intentions *A conscious decision to perform a behaviour or a resolve to act in a certain way*	78	I intend to provide communication partner training in the next three months	
Goals *Mental representations of outcomes or end states that an individual wants to achieve*	79	I have a goal to improve my communication partner training practice.	
	80	It is not a high priority to provide communication partner training in my current caseload.	
Memory, attention and decision processes	81	I routinely provide communication partner training.	

The ability to retain information, focus selectively on aspects of the environment and choose between two or more alternatives	82	I can forget to do communication partner training amongst my other work tasks.
Environmental context and resources *Any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behaviour*	83	My organisation does not provide me with sufficient resources to provide communication partner training.
	84	My organisation is willing to respond to any challenges I have in providing communication partner training.
Innovation *(additional domain added from Huijg et al (2014))*	85	Communication partner training is compatible with my regular clinical practice.
Social influences *Those interpersonal processes that can cause individuals to change their thoughts, feelings, or behaviours*	86	Communication partner training is not routinely conducted by my fellow colleagues.
	87	Potential communication partners are usually willing to be involved in communication partner training.
Patient *(additional domain added from Huijg et al (2014))*	88	When I offer communication partner training, my patients think it will help them.
Emotion *A complex reaction pattern, involving experiential, behavioural, and physiological elements by which the individual attempts to deal with a personally significant matter or event*	89	I feel stressed at the thought of providing communication partner training.
	90	Providing communication partner training is rewarding for me.
Behavioural regulation *Anything aimed at managing or changing objectively observed or measured actions*	91	In my workplace, we do not have systems for monitoring whether we provide communication partner training.
	92	In my workplace, there are policies/procedures that facilitate the use of communication partner training.

664 **6) ADDITIONAL COMMENTS**

No.	Question	Answer
93	I would say my communication partner training is consistent with best practice.	Strongly agree Agree Neutral Disagree Strongly disagree
94	The things that make it difficult for me to provide the best possible communication partner training for my TBI patients are:	Open-ended

95	The things that enable me to provide the best possible communication partner training for my TBI patients are:	Open-ended
96	Any other comments:	Open-ended
97	If you wish to receive a one page summary of the results of this research, please provide your email address. Email addresses will not be stored or linked to your results to maintain confidentiality.	Open-ended

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SUPPLEMENTARY MATERIAL 3: Current practice of TBI CPT (frequencies, n=87 for unfamiliar communication partners, n=136 for familiar communication partners, unless specified otherwise)

Characteristic	Unfamiliar communication partners (n=87)		Familiar communication partners (n=136)	
	N	%	N	%
Overall perception of current practice as consistent with best practice	n=132			
Strongly disagree	3	2.3%		
Disagree	30	22.7%		
Neutral	43	32.6%		
Agree	47	35.6%		
Strongly agree	9	6.8%		
Provided CPT (n=169)	98	58.0%	162	95.9%
CPT type (able to choose more than one)	n=87		n=136	
Skills training	76	87.4%	130	95.6%
Education	83	95.4%	127	93.4%
Counselling	21	24.1%	69	50.7%
Communication partners (able to choose more than one)				
Medical doctors	30	34.5%	na	na
Nurses	59	67.8%	na	na
Allied health professionals	76	87.4%	na	na
Patient service assistants	34	39.1%	na	na
Food service staff	19	21.8%	na	na
Administrative staff	15	17.2%	na	na
Volunteers	41	47.1%	na	na
Other	20	23.0%	na	na
Spouses/partners	na	na	134	98.5%
Family members	na	na	128	94.1%
Friends	na	na	77	56.6%
Employers/colleagues	na	na	42	30.9%
Community members	na	na	17	12.5%
Other	na	na	21	15.4%
Topics (able to choose more than one)				
Information about TBI	67	77.0%	128	94.1%
Information about specific communication disorders	73	83.9%	123	90.4%
General communication strategies	75	86.2%	97	71.3%
Individualised patient-focused communication strategies	75	86.2%	135	99.3%
Information about useful services	30	34.5%	97	71.3%
Consequences of communication disorders	63	72.4%	106	77.9%
Other	2	2.3%	6	4.4%
Teaching strategies (able to choose more than one)				
Role plays	42	48.3%	59	43.4%
Practice with patients with communication impairments	37	42.5%	109	80.1%
Didactic teaching	49	56.3%	54	39.7%
Instructional videos	35	40.2%	36	26.5%
Videos/audio recordings for feedback	27	31.0%	79	58.1%
Reflections for evaluation of personal success	49	56.3%	94	69.1%
Group discussions	69	79.3%	53	39.0%
Question and answer sessions	69	79.3%	87	64.0%
Published manuals/workbooks	12	13.8%	32	23.5%
Other	5	5.7%	7	5.1%
Used published programs in the last 12 months				
Yes	12	13.8%	27	19.9%

No	75	86.2%	109	80.1%
Published programs used in the last 12 months (able to choose more than one)	n=12		n=27	
TBI Express (Togher et al., 2010)	6	50%	16	59.3%
Supporting Partners of People with Aphasia in Relationships & Communication (SPPARC; Lock et al., 2001)	5	41.7%	18	66.7%
Connect's Conversation Partner Scheme (CPS; McVicker et al., 2009)	2	16.7%	1	3.7%
Supported Conversation for Adults with Aphasia (SCA™; Kagan et al., 2001)	3	25.0%	5	18.5%
Patient-Centred Communication Intervention (PCCI; McGilton et al., 2010)	1	8.3%	2	7.4%
Total Communication (Rautakoski, 2011)	5	41.7%	6	22.2%
Couples Therapy (Boles, 2009)	0	0%	0	0%
Communication Therapy for People with Aphasia and their Partners (APPUTE; Nykänen et al., 2013)	1	8.3%	0	0%
Conversational Coaching (Hopper et al., 2002)	1	8.3%	1	3.7%
MESSAGE (Smith et al., 2011)	0	0%	0	0%
Other	1	8.3%	3	11.1%
How strictly published programs are followed	n=12		n=27	
Strictly follow the protocol	3	25%	1	3.7%
Follow the protocol, but adapt it as needed	4	33.3%	16	59.2%
Use the protocol as a rough guide only	5	41.7%	10	37%
Delivery methods (able to choose more than one)				
Face-to-face	87	100.0%	136	100.0%
Written	42	48.3%	71	52.2%
Online	4	4.6%	6	4.4%
Delivery formats (able to choose more than one)				
Group	67	77.0%	31	22.8%
Patient with communication impairment and his/her communication partner	50	57.5%	130	95.6%
One-on-one	55	63.2%	94	69.1%
Frequency				
Once a year	4	4.6%	na	na
Twice a year	11	12.6%	na	na
Monthly	10	11.5%	na	na
As requested	51	58.6%	na	na
Other	11	12.6%	na	na
Usually (with about 90% of my patients)	na	na	26	19.1%
Frequently (with about 70% of my patients)	na	na	39	28.7%
Sometimes (with about 50% of my patients)	na	na	39	28.7%
Occasionally (with up to about 30% of my patients)	na	na	26	19.1%
Rarely (with up to about 10% of my patients)	na	na	6	4.4%
Number of sessions				
1 session	38	43.7%	15	11%
2 sessions	19	21.8%	46	33.8%
3 sessions	11	12.6%	27	19.9%
4 sessions	3	3.4%	13	9.6%
Other	16	18.4%	35	25.7%
Length of each session	n=83		n=131	
Less than 30 minutes	9	10.8%	7	5.3%
About 30-45 minutes	26	31.3%	44	33.6%
About 1 hour	34	41%	66	50.4%
About 2 hours	10	12%	10	7.6%
About 3 hours	2	2.4%	2	1.5%
More than 3 hours	2	2.4%	2	1.5%

Person delivering CPT (able to choose more than one)	n=83		n=131	
Me, the speech pathologist	83	100.0%	130	99.2%
A therapy assistant/ allied health assistant	14	16.9%	16	12.2%
Volunteer	1	1.2%	0	0%
Other	4	4.8%	3	2.3%

SUPPLEMENTARY MATERIAL 4: Labels and definitions of theoretical domains, and questionnaire items measuring each domain.

			n=134	
Domain	**No.**	**Question**	**Mean (range)**	**SD**
Knowledge *An awareness of the existence of something*	64	There is strong evidence for communication partner training.	3.97 (1-5)	0.84
	65	I know how to deliver communication partner training as per the recommendation.	3.36 (1-5)	0.91
	66	In my work with communication partner training, I know exactly what is expected from me.	3.38 (1-5)	0.93
Skills *An ability or proficiency acquired through practice*	67	I have had no or limited formal training in providing communication partner training.	2.75 (1-5)	1.27
	68	I have the skills to provide communication partner training.	3.84 (1-5)	0.83
Social professional role and identity *A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting*	69	Providing communication partner training is part of my role.	4.55 (1-5)	0.62
	70	Others in my workplace do not recognise providing communication partner training as part of my role.	3.60 (1-5)	0.93
Beliefs about capabilities *Acceptance of the truth, reality, or validity about an ability, talent or facility that a person*	71	I am confident in providing communication partner training.	3.43 (1-5)	0.90
	72	I do not have control over the provision of communication partner training in my workplace.	3.69 (1-5)	1.01
Optimism *The confidence that things will happen for the best or that desired goals will be attained*	73	I am optimistic that any issues around delivering communication partner training can be solved.	3.60 (2-5)	0.80
Beliefs about consequences *Acceptance of the truth, reality, or validity about outcomes of a behaviour in a given situation*	74	Communication partner training does not always result in the improved ability of communication partners to facilitate communication.	2.73 (1-5)	0.88
	75	If I deliver communication partner training, I believe that patients with communication impairments will be able to communicate more successfully.	4.25 (2-5)	0.60
Reinforcement	76	I receive recognition in my workplace for providing communication partner training.	3.01 (1-5)	0.94

Increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus	77	There is no encouragement given to me to provide communication partner training in my workplace.	3.40 (1-5)	1.09
Intentions *A conscious decision to perform a behaviour or a resolve to act in a certain way*	78	I intend to provide communication partner training in the next three months	4.03 (1-5)	0.77
Goals *Mental representations of outcomes or end states that an individual wants to achieve*	79	I have a goal to improve my communication partner training practice.	3.88 (1-5)	0.92
	80	It is not a high priority to provide communication partner training in my current caseload.	3.83 (1-5)	1.01
Memory, attention and decision processes *The ability to retain information, focus selectively on aspects of the environment and choose between two or more alternatives*	81	I routinely provide communication partner training.	3.47 (1-5)	1.01
	82	I can forget to do communication partner training amongst my other work tasks.	3.16 (1-5)	1.14
Environmental context and resources *Any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behaviour*	83	My organisation does not provide me with sufficient resources to provide communication partner training.	3.17 (1-5)	1.15
	84	My organisation is willing to respond to any challenges I have in providing communication partner training.	3.40 (1-5)	0.90
Innovation *(additional domain added from Huijg et al (2014))*	85	Communication partner training is compatible with my regular clinical practice.	3.91 (2-5)	0.76
Social influences	86	Communication partner training is not routinely conducted by my fellow colleagues.	3.05 (1-5)	1.03

Those interpersonal processes that can cause individuals to change their thoughts, feelings, or behaviours	87	Potential communication partners are usually willing to be involved in communication partner training.	3.49 (1-5)	0.86
Patient *(additional domain added from Huijg et al (2014))*	88	When I offer communication partner training, my patients think it will help them.	3.51 (2-5)	0.77
Emotion *A complex reaction pattern, involving experiential, behavioural, and physiological elements by which the individual attempts to deal with a personally significant matter or event*	89	I feel stressed at the thought of providing communication partner training.	3.61 (1-5)	1.03
	90	Providing communication partner training is rewarding for me.	4.30 (3-5)	0.59
Behavioural regulation *Anything aimed at managing or changing objectively observed or measured actions*	91	In my workplace, we do not have systems for monitoring whether we provide communication partner training.	2.40 (1-5)	1.06
	92	In my workplace, there are policies/procedures that facilitate the use of communication partner training.	2.56 (1-5)	0.98