

A Survey of Multidisciplinary Clinicians Working in Rehabilitation for People with
Traumatic Brain Injury

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Abstract

Little is known about clinicians' experiences in rehabilitation for people with traumatic brain injury (TBI). This survey study aimed to investigate clinicians' scope of practice, perceived barriers to practice, factors influencing confidence levels and professional development preferences. Participants included 305 clinicians (88% female, 97% aged 20-60 years) from psychology (28%), occupational therapy (27%), speech pathology (15%), physiotherapy (11%), social work (6%), rehabilitation medicine (3%) and nursing (3%) disciplines. Survey results indicated that goal setting, client or family education, and assessment for rehabilitation, were the most common activities across all disciplines (>90%). Client-related barriers, family-related barriers, and client-therapist relationship barriers were more frequently selected than workplace context and professional skill barriers ($p < .05$). Clinicians working with clients with mild TBI reported significantly fewer barriers ($p < .05$); yet, they were less confident in overcoming barriers than clinicians working with clients with more severe TBI ($p < .001$). Clinicians with fewer years of experience (<2 years) reported significantly lower confidence in overcoming barriers than clinicians with 2-10 years and >10 years of experience ($p < .01$). The most commonly selected professional development areas included new interventions and therapies, translating rehabilitation research into everyday practice and client specific topics. These findings provide a unique multidisciplinary perspective on clinicians working in TBI rehabilitation in Australia. Understanding of the perceived barriers to practice and professional development needs may guide training and support initiatives for clinicians which, in turn, may enhance the quality of brain injury rehabilitation.

Introduction

Traumatic brain injury (TBI) rehabilitation is a challenging field for health professionals to work in. The functional effects of TBI vary from mild deficits with little to no activity restrictions to more severe impairments with major activity restrictions (e.g., loss of independence, inability to drive and work). The diverse physical, cognitive, emotional and behavioural effects necessitate interventions involving unique knowledge and skills from a variety of medical and allied health specialties as part of a multidisciplinary approach to rehabilitation. Currently, there is little understanding of the barriers to practice and professional development needs perceived by clinicians working in this field. Such knowledge may guide initiatives to enhance the quality of brain injury rehabilitation services and improve outcomes for clients with TBI and their families (McDonald et al., 2012).

It is estimated that approximately 10 million people each year sustain a TBI of varying severity worldwide (Corrigan, Selassie & Orman, 2010). In Australia each year, approximately 1,500 people sustain a moderate TBI and 1,000 people sustain a severe TBI (Access Economics, 2009). Overall, there are approximately 21,000 new cases of TBI each year which range in severity from mild to very severe (Australian Institute of Health & Welfare, 2007). The total annual cost of TBI in Australia for 2008 alone was estimated to be \$8.6 billion, with a lifetime cost per incident case of severe TBI between \$2.5 million and \$4.8 million (Access Economics, 2009). The major costs include health system expenses (e.g., administration, ambulance, hospital, paramedical and medical), equipment and home modification costs, long term care costs (e.g., accommodation, respite care, personal assistance), and productivity costs. Such costs are increasing over time due to improved survival rates (Jackson & Manchester, 2001).

TBI Rehabilitation

In Australia, rehabilitation services for TBI have been established in some form for over 30 years (Tate, 2008). After clients' critical medical issues have been managed, inpatient rehabilitation programs may address issues with swallowing, mobility, speech and communication, self-care, independent living and cognitive, emotional and behavioural functioning. The focus of inpatient rehabilitation is on restoring, improving and maintaining clients' functional abilities in preparation for discharge and community reintegration with multidisciplinary programs tailored according to individual needs (NSW Government, 2011).

Clients with moderate to severe TBI usually require outpatient rehabilitation to facilitate ongoing gains in the community and goal attainment. Outpatient programs often involve multidisciplinary therapies in relation to different functional goals (e.g., speech, occupational therapy), and may include a range of interventions such as individual therapy, group therapy, cognitive rehabilitation, psychotherapy, psycho-education and family therapy (Tsaousides & Gordon, 2009). Common goals during the first few months post-discharge include improving independence (e.g., meal preparation, budgeting, community access), return to driving, return to school/work, parenting and family role functioning, and re-engagement in social and leisure activities (Turner, Ownsworth, Turpin, Fleming & Griffin, 2008). Once the client is able to live in the community with some degree of support, additional community services may provide long-term case management and rehabilitation to support clients and their families.

Disciplines involved in brain injury rehabilitation include, but are not limited to, specialist doctors and rehabilitation physicians, nurses, physiotherapists, speech pathologists, occupational therapists, social workers and psychologists. Multidisciplinary and interdisciplinary team approaches have been advocated for many decades in health

care settings, particularly in neurorehabilitation (Booth & Hewison, 2002; Suddick & De Souza, 2006). Multidisciplinary teams consist of professionals who work in parallel but have clear role definitions and tasks, whereas interdisciplinary teams collaboratively discuss and set treatment goals and jointly carry out treatment plans (Körner, 2010). More generally, teams involving professionals from specialised disciplines collaborating on the shared goal of improving patients' functioning are integral in brain injury rehabilitation (Wertheimer et al., 2008). Benefits of working in a multidisciplinary team in neurorehabilitation have been identified for patients (e.g., holistic care and continuity), team members (e.g., shared workload), the team (e.g., sharing of information and skills) and the service (e.g., improved efficiency and coordination) (Suddick & De Souza (2006). Both the clinical and cost-effectiveness of multidisciplinary approaches to brain injury rehabilitation have been demonstrated (Turner-Stokes, 2008).

Within this context, rehabilitation roles and activities often overlap between disciplines. For example, goal setting, education and assessment of adaptive function and assessment and rehabilitation of cognitive-linguistic abilities may be conducted by several disciplines within the team (Sander, Raymer, Wertheimer & Paul, 2009; Wertheimer et al., 2008). Cognitive rehabilitation has been identified as another common area of overlap, which may be provided by neuropsychologists, speech therapists and occupational therapists (Mazmanian, Kreutzer, Devany & Martin, 1993; Stringer, 2003). Role overlap is generally viewed as important to support the continuum of intervention, which in turn has a positive impact on client outcomes (Wertheimer et al., 2008). However, perceptions of role overlap can also create a sense of role insecurity, territorial feelings and unequal status (Booth & Hewison, 2002; Sander et al., 2010). Further challenges related to working in multidisciplinary teams include misperceptions of the roles and practices of other disciplines and lack of communication or contact between

team members (Booth & Hewison, 2002; Wertheimer et al., 2008). Conversely, facilitators of effective collaboration included physical proximity, team meetings, good communication, shared information and collegiality (Wertheimer et al., 2008).

Barriers to Providing Rehabilitation

Regardless of the team environment, clinicians working in TBI rehabilitation often face barriers to their practice. The complex physical, cognitive, behavioural and emotional effects of TBI may interfere with the process and outcomes of rehabilitation. For example, in a study of occupational therapists in New Zealand, memory deficits, disorientation, attention disturbance, lack of insight and limited problem solving skills were identified as client-related barriers to rehabilitation practice (Graham, Robertson & Anderson, 2013). Similarly, in a UK survey of psychotherapists working in the TBI field, Judd and Wilson (2005) identified clients' lack of insight, impaired memory, inflexible thinking, poor attention, language deficits, disinhibition and emotional lability as key challenges. Memory and learning impairments were considered the most significant barriers which can limit the ability to learn and generalise new skills in rehabilitation (see also Boosman, Visser-Meily, Ownsworth, Winkens, & Van Heugten, 2014). As identified by speech-language pathologists (Hicks, Larkins & Purdy, 2011), fatigue is another major barrier that needs to be actively managed to enhance intervention effectiveness.

Collaborative relationships between the client with TBI, family members and therapists are considered crucial to rehabilitation success (Bishop, Degeneffe & Mast, 2006). Poor self-awareness and unrealistic expectations may interfere with the therapeutic alliance due to lack of agreement on therapy tasks and goals between the client and the therapist (Sherer et al., 2007). Family members may overestimate or minimise clients' impairments which can interfere with goal setting and the rehabilitation

process more broadly. McLaughlin and Carey (1993) found that conflict between the rehabilitation team and family of TBI clients was associated with longer length of stay and lower program satisfaction. In contrast, having family members engaged in the rehabilitation process has been linked to improved client outcomes (Foster et al., 2012), particularly for clients with families with stronger functioning (Barclay, 2013).

Focusing on contextual factors influencing intervention practices, Wong, McKay and Stolwyk (2014) assessed the frequency in which psychoeducation, cognitive rehabilitation, supportive counselling, behaviour management and psychological therapies were delivered by neuropsychologists ($n = 114$) to people with neurological disorders. The most common intervention delivered was psycho-education (84%), and the least common was psychological therapy (20%). Clinicians' confidence in delivering interventions significantly predicted the frequency with which all interventions were delivered. Number of years of clinical experience and quality of training were not significant predictors of frequency of intervention delivery. However, number of years of clinical experience predicted clinicians' confidence in delivering psycho-education and cognitive rehabilitation. Overall, frequency of current intervention delivery was the best predictor of confidence in delivering each intervention type. Other barriers to delivering interventions included lack of time, limited resources, and inadequate training (Wong et al., 2014).

The notion that professionals' confidence can be a barrier or facilitator to effective clinical practice has been explored in a range of settings, including nursing and medicine (Ammentorp, Sabroe, Kofoed & Mainz, 2007; Ryan et al., 2013), social work (Pedrazza, Trifiletti, Berlanda & Bernado, 2013), occupational therapy (Wilding, Curtin & Whiteford, 2012), speech pathology (Hux, Walker & Sanger, 1996) and neuropsychology (Wong et al., 2014). Professional confidence has been defined as 'a dynamic, maturing

personal belief held by a professional or student. This includes an understanding of and a belief in the role, scope of practice, and significance of the profession, and is based on their capacity to competently fulfil these expectations' (Holland, Middleton & Uys, 2012, p. 222). Greater confidence has been found to be related to increased frequency of delivering neurorehabilitation interventions (Wong et al., 2014). Further, TBI specific education and training can enhance therapists' confidence and willingness to provide therapy (Cook et al., 2013; Hux et al., 1996). Such findings highlight the links between clinical experience, training opportunities and confidence.

Rationale and Aims of the Present Study

While a number of studies have examined clinicians' perceptions of neurorehabilitation practice (e.g., Judd & Wilson, 2005; Sander et al., 2010; Wertheimer et al., 2008; Wong et al., 2014), few studies have focused specifically on clinicians' experiences in TBI rehabilitation. Further, despite the recognised importance of multidisciplinary approaches in rehabilitation, there are limited studies conducted from a multidisciplinary perspective. Accordingly, the first aim of this study was to investigate the profile of clinicians and their scope of rehabilitation practices in TBI. It was hypothesised that some core areas of rehabilitation practice would emerge as common to all disciplines, and that other more discipline-related areas of practice would also be identified. The second aim was to identify the most common barriers to providing TBI rehabilitation and to determine clinicians' level of confidence in overcoming barriers. A third aim was to investigate factors related to the number of barriers and level of confidence. It was hypothesised that years of experience would be positively related to clinicians' confidence. The final aim was to identify clinicians' preferences for professional development to enhance the effectiveness of their rehabilitation practice with TBI clients.

Method

Participants

Clinicians from any health discipline who were currently working with clients with TBI and were based in Australia were eligible to participate. Participants were recruited from brain injury and rehabilitation conferences and national and international professional membership data bases (see Procedure). A total of 441 surveys were submitted, which included 97 surveys from clinicians living outside Australia. A further 39 surveys had excess missing data on key variables for an entire survey section (see Data Analysis). Overall, 305 participants met the inclusion criteria and completed sufficient sections of the survey. The characteristics of the clinician sample are described in the Results.

Materials

Parallel versions of the survey were developed in hard copy and online formats. The sections and items of the survey were designed in collaboration with members of the multidisciplinary NHMRC Centre for Research Excellence (CRE) in Brain Recovery (McDonald et al., 2012). This process commenced in 2013 and involved circulating an initial survey draft to nine Chief Investigators and post-doctoral researchers (with representation from psychology, speech pathology and occupational therapy disciplines) for feedback via email. Further feedback was sought from the CRE members during a teleconference. The survey was then piloted with two clinicians whose feedback (mostly minor wording changes) was incorporated into the final survey. The online survey was created and launched in Lime Survey (v1.9).

An information sheet was included in both versions (electronic and hard copy) of the survey. Consent was implied by completion and return or submission of the survey. The survey took approximately 10-15 minutes to complete and responses were anonymous.

The majority of survey questions were designed as fixed-alternative items with the opportunity to add text in an 'other' section as relevant. The closed question and categorical response format was chosen to minimise time demands on participants, thus aiming to maximise the response rate. The survey consisted of four main sections, as follows:

1. *Demographics*: 14 questions regarding information on role title, country of residence, age, gender, discipline, nature of practice (e.g., part of a multidisciplinary team), highest level of qualification, years of experience and time per week engaged in practice with clients with TBI, location, practice setting*, client type* and client functional status (injury severity)*. In the electronic survey all questions in this section (excluding role title) prompted a mandatory response. Questions marked with an asterix (*) could receive multiple responses. Participants were able to respond in a free text box if they had an 'other' response.
2. *Scope of practice*: participants were asked how frequently they practice 21 listed rehabilitation activities using three response options: '*always / frequently*', '*sometimes*', '*never*'. Scope of practice was presented in five categories; assessment (1 item), rehabilitation planning (1 item), coordination of rehabilitation and support (1 item), intervention delivery (17 items) and evaluation (1 item). This was set up as a mandatory section in the electronic survey. A free text area allowed participants to list any other areas of practice with clients with TBI.
3. *Barriers to practice and confidence ratings*: participants were asked to identify if certain barriers were present in their rehabilitation practice (22 items total). For each item identified as a barrier ('Yes' response), they were then asked to rate their confidence in providing effective rehabilitation despite the barrier on a 10-point scale from 1 (not at all confident) to 10 (very confident). Barriers were grouped into five

categories; client-related (8 items), family-related (2 items), client-therapist relationship (3 items), workplace context (5 items) and professional skill (4 items). A free text box allowed participants to list any other barriers experienced in rehabilitation with TBI clients.

4. *Professional development preferences*: participants were asked to indicate preferred topics for, and modes of professional development. Options for mode included ‘workshop’, ‘conference theme’, ‘resources’ or ‘other’. Topics were grouped into five categories: client functioning (6 items), client activity and role participation (6 items), client / therapist relationship (1 item), broader rehabilitation (5 items) and client specific (3 items). A free text box enabled participants to list any other preferences for professional development topics or suggested modes of delivery.

A final question asked participants to indicate the source from which they received the survey.

Reliability analysis of the clinician survey

To enhance ease of completion of the survey, barriers were listed according to pre-established categories; client-related, family-related, client-therapist relationship, workplace context and professional skill. Internal consistency of the total scale and subscales based on these categories was examined using Cronbach’s alpha. As shown in Table 1, the reliability analysis indicated satisfactory internal consistency for the total barriers section ($\alpha = .87$) and subcategories in the survey ($\alpha = .66-.85$). Similarly, internal consistency was high for confidence ratings ($\alpha = .84-.95$), as calculated using a subsample of participants ($n=45$) who provided confidence ratings for all barriers.

Insert Table 1 about here

Construct validity of the clinician survey

To determine the appropriateness of using subscale scores in the analysis, the 22 items in the barrier section were subjected to a principal components analysis (PCA) using varimax rotation with Kaiser Normalisation. As the confidence ratings were only completed by participants who experienced the respective barrier, the number of participants in this analysis was reduced from 305 to 45 for all 22 items. Therefore, PCA was not conducted for confidence ratings. The PCA on the barrier items revealed five components with eigenvalues exceeding 1.0; which explained 28%, 14%, 7%, 6%, and 5% of the variance respectively (see Table 2). The item commonalities for each component were all greater than .50. The item 'lack of professional development' loaded onto two components (workplace context and professional skill); however, this item was retained in the original category of professional skill.

Insert Table 2 about here

Procedure

The study was approved by the Griffith University Human Research Ethics Committee (Reference Number: PSY/42/13/HREC). Participants were recruited through professional membership bodies and conferences using both hard copy (completed by 21%) and electronic survey dissemination (completed by 79%). Hard copies of the survey were distributed at the following forums (proportion of sample indicated):

1. The 36th Annual Brain Impairment Conference hosted by the Australian Study of the Society of Brain Injury (ASSBI) held in Tasmania May 2013 (13% of sample).
2. 'Living Life to the Fullest' Current Directions in Children's Rehabilitation Conference, Royal Brisbane and Women's Hospital, Brisbane, August 2013 (5% of sample).
3. Occupational Therapy Australia QLD Conference, Gold Coast, June 2013 (4% of sample).

In addition, an email with the survey link was sent to the Chair or Executive Officers of diverse professional organisations. These organisations and proportion of the sample represented were as follows: 1) ASSBI Members (27%); 2) Neuropsychological Rehabilitation Special Interest Group of the World Federation for NeuroRehabilitation (1%, note: the majority of these members are international and Australian members were likely to have received the survey from another source); Synapse Brain Injury Network (Queensland; 1.3%); Victorian Brain Injury Recovery Association (2.6%); QLD Physiotherapy Rehabilitation Network (2%); Occupational Therapy Australia (QLD Neuro Interest Group, 1%); and Speech Pathology in Brain Injury Interest Group (3%). The estimated total number of people to whom the survey or survey link was distributed was approximately 6,000.

A snow-balling method of recruitment was also employed in which participants were encouraged to forward the link for the electronic survey, or distribute hard copy surveys to their colleagues. This recruitment source yielded the highest proportion of participants (33%). A further 7% of the sample did not identify the source of the survey. Participants were alerted to the possibility of receiving the survey from more than one source, and were asked to complete the survey only once.

Data Analysis

Data were screened for accuracy of entry and missing data. Surveys were excluded in cases where responses were missing on key variables for an entire survey section (e.g., no responses made in the section on barriers to practice). However, participants were retained if they completed all survey sections with the exception of professional development requirements (the final survey section). Based upon these guidelines, 39 participants (11%) were excluded from the analysis due to excess missing data. Chi-square analyses or z -tests of independent proportions (for cell sizes <5) indicated no

significant differences between excluded participants ($n=39$) and those retained for analysis ($n=305$) in terms of age, gender, discipline, team setting, qualification, work context, years of experience, level of client contact and client functional status.

In the scope of practice section, some participants (1%) did not respond to each item relating to whether they performed an activity '*rarely/never*', '*sometimes*' or '*always/frequently*'. In the barriers section, in cases (8%) where participants provided a confidence rating but did not tick '*Yes, I experience this barrier*' this was assumed to indicate that the barrier was applicable. In cases (<1%) where participants ticked '*Yes, I experience this barrier*' but did not include a confidence rating, this was treated as missing data for confidence ratings. In cases (12%) where participants selected more than one discipline, the discipline with the highest qualification was chosen for the purposes of analysis.

Non-parametric statistical analyses (i.e., z-tests for proportions-independent or proportions-dependent groups) were used for categorical data, with relevant assumptions (e.g., cell size ≥ 5) checked prior to analysis. For total number of barriers (yes responses out of 22) and average confidence ratings (1-10), data were screened for assumptions related to parametric analyses (i.e., t-tests, correlation and ANOVA). Transformations conducted to counter the impact of negative skewness (i.e., number of barriers) did not alter the significance of any results. Therefore, findings based on non-transformed data are reported.

A series of one-way ANOVAs was performed to investigate factors related to total number of barriers and average confidence rating. Significant results ($p < .05$) for average total confidence rating were further investigated using one-way ANOVAs for each barrier category (i.e., client-related, family-related, client-therapist relationship, workplace context and professional skill). Significant results for barrier category were

examined using post-hoc tests with the Sidak correction. Effect sizes were interpreted using partial eta squared, as follows: .01 = small, .06 = medium, and .14 = large (Cohen, 1992).

Results

Client and Workplace Characteristics of the Clinician Sample

As shown in Table 3, the highest proportion of participants were aged 31-40 years (31%) and the majority were female (88%). Participants represented a range of disciplines including psychology (28%), occupational therapy (27%), speech pathology (15%), physiotherapy (11%), social work (6%), rehabilitation medicine (3%) and nursing (3%). A further 22 participants (7%) identified 'other disciplines' (mostly not specified). Most participants had a Bachelor Degree as the highest level of qualification (42%), and a further 54% had attained a higher qualification such as Honours (9%), Masters (26%), Doctorate (9%) or PhD (11%). As the survey originated in Queensland, most participants were from this state (31%). However, nearly half of the participant sample was based in New South Wales (24%) or Victoria (23%). There were relatively few participants from Western Australia (9%), South Australia (8%), Tasmania (5%), ACT (1%) and Northern Territory (<1%).

Insert Table 3 about here

As shown in Table 4, the highest proportion of participants had >15 years of experience in working with clients with TBI (28%). Approximately 13% had one year or less experience and thus potentially represented new graduates or those new to working in TBI rehabilitation. The majority of participants worked with adults with TBI (65%). Approximately 14% worked in paediatric TBI and only a small proportion worked with older adults with TBI (2%). Just over 30% of the sample worked with clients across all functional status categories (mild to very severe). The next highest proportion of the

sample (19%) worked only with clients with mild TBI and the remainder worked with clients with severe (10%) or very severe TBI (4%).

The amount of time spent per week working with clients with TBI varied from less than one day a week (< 6 hours, 22%) to full time (>35 hours, 15%). The highest proportion of participants worked 16-25 hours per week with clients with TBI (30%). Approximately 45% of participants worked in public or government-funded settings including inpatient (22%), outpatient (13%), or community services (14%). Private work settings were identified by 13% of the sample, including community private practice (10%), outpatient private (2%) or inpatient private (<1%). A considerable proportion (35%) identified as working in more than one work setting, with the most common combination being inpatient public and outpatient public (15%).

The majority of participants identified as working in a multidisciplinary team with members of different health disciplines providing a service to the same client (74%). Approximately 13% of participants identified as working by themselves and contacting other health professionals as required (e.g., client referral or liaison) and a further 9% identified as working in a service with other health professionals, but not in a multidisciplinary team.

Insert Table 4 about here

Scope of Practice

As shown in Table 5, the most common areas of practice across all disciplines included goal setting (98%), client or family education (97%), assessment for rehabilitation needs (95%) and provision of feedback following assessment (94%). Behaviour management and support (84%), evaluation of rehabilitation outcome (84%) and cognitive rehabilitation (81%) were also identified as common areas of practice. Other practice areas identified through free text included: driving assessment and

rehabilitation, liaison and linkage with support services, return to general activities (e.g., sport, music, leisure), sexuality and substance abuse support.

Insert Table 5 about here

Table 6 presents the six rehabilitation activities that appear to be core or common to all disciplines, with at least 70% of participants from all disciplines reporting the activity as '*always/frequently*' or '*sometimes*' part of their practice. Table 7 depicts areas of practice that appear to be more discipline related. As shown, only a small proportion of psychologists identified that they '*sometimes*' or '*always/frequently*' perform activities that were predominantly performed by other disciplines. For example, approximately 14% of psychologists reported providing sensory and perceptual skills therapy and education or training in use of equipment or technology and only 11% reported providing speech or language therapy. Psychologists were found to perform less case management and coordination (53% vs. 77%-100%; $p<.05$) and be less involved in hospital to home transition / discharge planning (42% vs. 63%-100%; $p<.05$). Of all the health disciplines, occupational therapists appeared to have the broadest scope of practice; with 16 of the 21 rehabilitation areas selected by over 70% of the occupational therapy sample (see Tables 6 and 7).

Insert Table 6 about here

Insert Table 7 about here

Barriers to Practice and Confidence Ratings

As shown in Table 8, the most common barriers reported by clinicians were client-related (88-96%), with poor attention and concentration most frequently identified. The least common barriers were related to workplace context and professional skill. Lack of multidisciplinary collaboration (within the workplace context category) was the least common barrier identified (39%). Other barriers identified through the free text option

included: specific funding obstacles, communication issues between services or disciplines, bureaucracy or administrative issues. Overall, client-related barriers, family-related barriers, and client-therapist relationship barriers were more frequently selected than workplace context and professional skill barriers ($p < .05$). Further, client-related barriers were more frequently identified than barriers relating to the client-therapist relationship ($p < .05$).

Table 8 also presents the mean confidence ratings for each barrier. Interestingly, although less commonly rated as barriers, clinicians were least confident in dealing with barriers relating to workplace context and professional skill. They were most confident in dealing with client-therapist relationship barriers and client-related barriers. Clinicians were most confident in overcoming barriers related to establishing a good working alliance ($M = 8.16$, $SD = 1.56$), and were least confidence in dealing with lack of opportunity in their role to provide the appropriate level or type of rehabilitation ($M = 5.92$, $SD = 2.12$). Overall, no significant differences in confidence ratings were found between the barrier categories ($p > .05$).

Insert Table 8 around here

Factors related to number of barriers and confidence ratings

Table 9 presents the results of one-way ANOVAs investigating factors related to total number of barriers and average confidence ratings. Despite a significant overall difference in number of barriers according to discipline ($p < .05$), post-hoc tests were not significant ($p > .01$). However, a comparison between clinicians with a psychology background ($n = 85$) and those from a discipline other than psychology ($n = 220$) identified that psychologists perceived significantly fewer barriers ($M = 14.07$, $SD = 4.36$) than other clinicians ($M = 15.98$, $SD = 4.20$) ($F = 12.38$, $p < .01$). Further, there was a significant difference in number of barriers according to clients' functional status. Post-

hoc tests identified that clinicians working with clients with mild TBI perceived fewer barriers than those working with clients with severe TBI ($p = .014$) and very severe TBI ($p = .024$).

Insert Table 9 around here

Confidence ratings were also found to significantly differ according to clients' functional status ($p < .001$). Post-hoc tests identified that clinicians working with clients with mild TBI had significantly lower confidence ratings than clinicians working with clients with more severe TBI ($p < .01$) in all categories except the family-related category (see Table 10). Confidence ratings also significantly differed according to years of experience ($p < .01$). Post-hoc comparisons indicated that clinicians with < 2 years of experience had lower confidence ratings than clinicians with 2-10 years of experience ($p = .013$) and clinicians with > 10 years of experience ($p < .01$). Clinicians with 2-10 years of experience did not differ in average confidence ratings from clinicians with > 10 years of experience. As shown in Table 10, clinicians with < 2 years of experience reported lower confidence ratings than clinicians with > 10 years of experience for client-related, family-related, and client-therapist relationship barriers.

Insert Table 10 about here

Given the finding that clinicians working with clients with mild TBI ($n = 58$) had lower confidence ratings, it was relevant to determine whether these clinicians were more likely to have < 2 years of experience. Frequency data indicated that this was not the case, as nine (16%) had < 2 years of experience, 31 (53%) had 2-10 years of experience and 17 (29%) had > 10 years of experience (1 participant did not report level of experience). A standard regression analysis was also conducted to determine the unique contribution of clients' functional status and years of experience in explaining average confidence ratings. These variables significantly accounted for clinicians' confidence

ratings ($R^2 = .13$, $F = 22.71$, $p < .001$), with each variable making a significant independent contribution to confidence ratings ($\beta = .23-.26$, $p < .001$, $sr^2 = .05-.07$).

Professional Development Preferences

Clinicians' preferred topics and modes of professional development to enhance the effectiveness of their practice are displayed in Table 11. The most common topics selected included: new interventions and therapies (76%); insight or self-awareness (66%); translating rehabilitation research into everyday practice (65%) and cognitive function (64%). Other topics selected by more than 50% of participants included: behaviour management, measuring the efficacy of rehabilitation outcomes, and emotional adjustment. In terms of delivery mode, workshops (71%) and resources (45%) were more commonly selected than a dedicated conference theme (34%). There were several comments in the free text section suggesting that online modes of delivery (e.g., webinars and podcasts) were popular. Reasons provided for these online modes of delivery included time constraints, greater accessibility and limited funding for professional development.

Insert Table 11 about here

Discussion

This survey study of clinicians in TBI rehabilitation sought to identify clinicians' scope of practice, perceived barriers and confidence, and professional development preferences from a multidisciplinary perspective. As hypothesised, both core and discipline-related areas of rehabilitation practice emerged across the disciplines represented in the survey. Client-related barriers to rehabilitation were most commonly perceived, although clinicians were relatively confident in overcoming these barriers. The main factors found to be related to perceived barriers and associated confidence ratings included the clients' functional status and clinicians' years of experience.

Workshops on new therapies and interventions were most frequently selected as a preference for professional development.

The first aim of this study was to explore the profile and scope of practice of clinicians working with TBI clients. In terms of clinicians' characteristics, the disciplines of psychology (28%), occupational therapy (27%) and speech pathology (15%) were better represented in the sample than physiotherapy (11.5%), social work (5.5%), nursing (3%) and rehabilitation medicine (3%). The majority of clinicians had worked in TBI rehabilitation for at least two years (87%), with over one third (38%) having more than 10 years of experience in this field. Clinicians predominantly worked with adults (86%), and a small proportion worked with both paediatric and adult clients (4%). Most clinicians worked with clients with severe to very severe TBI (81%), although approximately one third worked with clients across the spectrum of mild to very severe TBI. Clinicians typically worked with TBI clients for at least two days per week (60%) as part of a multidisciplinary team (74%).

As hypothesised, the survey identified both core and discipline-related activities performed by clinicians. In relation to core activities, goal setting, client or family education, and assessment for rehabilitation needs were performed by over 90% of clinicians from seven different disciplines working in the TBI rehabilitation. Goal setting has previously been found to be a core component of brain injury rehabilitation (Doig, Fleming, Cornwell, & Kuipers, 2009; Evans, 2012). Similarly, assessment is well-established as a fundamental process for all rehabilitation clinicians (Sander et al., 2009). The high proportion of clinicians providing client or family education (94-100%) reinforces previous findings that psychoeducation is a core element of TBI rehabilitation practice (Barclay, 2013; Bishop et al., 2006). Other common areas of rehabilitation

practice included provision of assessment feedback (78-100%), behaviour management and support (80-100%) and evaluation of rehabilitation outcome (71-100%).

Previous research has documented the common experience of role overlap among clinicians on multidisciplinary rehabilitation teams, although studies have mainly focused on two disciplines (e.g., Booth & Hewison, 2002; Sander et al., 2009; Wertheimer et al., 2008). While the nature of activities identified as core for all disciplines is perhaps unsurprising, such findings do not necessarily signify role overlap (i.e., clinicians performing the same activities in the same way). Rather, each discipline is likely to perform these activities in a manner relevant to their focus of rehabilitation, although this was not specifically investigated in the survey. Further research is needed to determine the process by which core activities such as goal setting, psychoeducation and assessment are performed by each discipline in TBI rehabilitation.

In addition to core activities performed by each discipline, the survey identified those that are more discipline-related. Overall, occupational therapists were found to select the most areas of rehabilitation practice (16 out of 21 activities performed by >70%), followed by speech pathologists (12 out of 21 activities performed by >70%). Such findings on the breadth of practice of these disciplines highlight the likely benefits interdisciplinary training and professional development in common practice areas (e.g., cognitive rehabilitation, supportive counselling and return to work/school transition). More generally, the findings support the need for rehabilitation professionals to have a good understanding of shared or complimentary areas of practice in addition to more discipline-related expertise (Brooks, Rhodes & Tefft, 2014). Further research evaluating the impact of interdisciplinary training on both the processes and outcomes of TBI rehabilitation would be beneficial.

A further key study aim was to identify the most common barriers perceived by clinicians and their confidence in providing effective rehabilitation despite these barriers. The barriers most commonly selected were client-related, with poor attention and concentration most frequently selected (96%), followed by memory impairment and lack of self-awareness (95%). Barriers related to workplace context were the least commonly selected, with lack of multidisciplinary collaboration receiving the lowest endorsement (39%). It is noteworthy that 74% of clinician sample identified as working in a multidisciplinary team, which may account for this finding. Although items related to workplace context were less commonly identified as barriers, the clinicians who endorsed such obstacles reported low confidence in overcoming these issues. In particular, clinicians who selected lack of resources/funding (63%) and lack of opportunity in the role to provide the level or type of rehabilitation to clients (59%) provided the lowest confidence ratings (5.9-6.1/10). As these barriers are likely to arise from broader organisational issues within the healthcare setting, clinicians may perceive less scope to overcome these barriers as compared to other barriers (e.g., managing issues with the client-therapist relationship). As previously discussed, prior studies have focused mainly on client-related barriers from a discipline specific perspective (e.g., Graham et al., 2013; Hicks et al., 2011; Judd & Wilson, 2005). Hence, the current findings provide a more comprehensive perspective on barriers to practice in TBI rehabilitation from several disciplines.

In regards to factors influencing perceived barriers, participants working with clients with mild TBI identified significantly fewer barriers than those working with clients with severe or very severe TBI. This is perhaps not surprising given that clients with severe or very severe TBI typically have considerably more physical, cognitive and behavioural symptoms which can interfere with the rehabilitation process (Ponsford et. al., 2014).

Due to the typically long-term support needs of clients with more severe TBI, there are likely to be more demands placed on clinicians' skills, time and resources (Turner-Stokes, 2008).

Clients' functional status was also significantly related to clinicians' confidence ratings, albeit in an unexpected way. Specifically, clinicians working with people with mild TBI reported significantly lower confidence ratings than those working with people with more severe TBI. This finding may be related to clinicians' perceptions of their capacity to fulfil expectations of their role and experiences of success (Holland et al. 2012). For example, clinicians working with clients with severe TBI may not expect their clients to resume premorbid roles and activities, or at least not in the same capacity; hence, they may not define rehabilitation success according to these outcomes. In contrast, clients with mild TBI are typically expected to return to high levels of functioning within the home and community (Daneshvar et al., 2011; Ponsford et al., 2000). Lack of success in achieving these outcomes can mean that clients with mild TBI require longer-term support, which has implications for clinicians (e.g., caseload) and their service. Brain injury rehabilitation services may also be more geared to support clients with severe TBI, with fewer programs for managing the often more subtle deficits experienced by clients with mild TBI. Overall, the factors influencing the lower confidence ratings of clinicians supporting clients with mild TBI requires further investigation.

Another factor influencing clinicians' confidence ratings (independent of clients' functional status) was their years of experience in working with TBI clients. Clinicians with less than two years of experience had significantly lower confidence ratings than clinicians with over 10 years of experience. Interestingly, current weekly contact with TBI clients was not significantly related to confidence ratings; instead, the overall

duration of time working with clients with TBI impacted on clinicians' perceptions of their ability to provide effective rehabilitation despite obstacles. Wong et al. (2014) also found that increased years of experience was related to greater confidence in delivering neurorehabilitation interventions. Greater years of experience may support clinicians to draw on their skills and expertise to manage a range of barriers, which in turn may sustain their career in this challenging field. In a study on work satisfaction in brain injury rehabilitation professionals, Wittig et al. (2003) found that client-related issues did not contribute substantially to clinicians' stress levels. Rather, client-related challenges were perceived to promote professional growth and creativity. Professionals' work satisfaction was related to feeling important, valued by the organisation and supported in the workplace; however, the best predictor of work satisfaction was level of training support. It was not possible to determine in the current study whether participants with less than two years of experience were new graduates, or had recently started working with clients with TBI. Nevertheless, the findings suggest the need to provide new graduates and those new to working in TBI rehabilitation with professional development and mentoring opportunities to enhance their emerging skills and confidence.

Clinicians' top three topic preferences for professional development were new interventions and therapies (76%), insight or self-awareness (66%), and translating rehabilitation research into everyday practice (65%). Their desire to stay abreast of evidence-based approaches was also evident from comments in the free text field which referred to more practical application of research as opposed to "theoretical" content. Other client-specific training topics selected by over half of the sample included: cognitive function (64%), behaviour management (59%) and emotional adjustment (52%). These findings indicate that the client-related issues most commonly perceived as barriers to rehabilitation practice map onto clinicians' preferences for education and skill

development. In terms of delivery mode, clinicians more frequently indicated a preference for workshops on each topic than conferences and resources (note: one exception related to a stronger preference for resources on fatigue). Responses in the free text indicated that some people preferred online training resources such as webinars and podcasts. Participants noted that time constraints, inaccessibility and lack of funding were all barriers to attending professional development events. These comments are consistent with the trend for an increase in computer-mediated professional development and training in the health care industry (e.g., Triola, Huwendiek, Levinson & Cook, 2012). Despite the potentially greater convenience of online training and professional development events, the quality of learning outcomes needs to be compared with face-to-face skills-based workshops.

There are a number of limitations of this study which relate to sampling and the survey design. Firstly, it cannot be assumed that the participants were broadly representative of clinicians working in TBI rehabilitation in Australia. The main sources of recruitment were the ASSBI member email distribution list and ASSBI conference delegates (2013 conference). Hence, the survey findings are likely to be most generalisable to clinicians involved in TBI rehabilitation who are affiliated with ASSBI. The findings are also more likely to reflect the experiences of clinicians working in metropolitan areas of Queensland, New South Wales and Victoria. This is an important issue due to variations in funding models and service delivery between states and geographic locations (e.g., rural and remote areas) which may influence clinicians' scope of practice and barriers in rehabilitation (Government of South Australia, 2012; Mitsch, 2011). Although there were no differences in total barriers or confidence ratings according to state and geographic location (see Table 9), due to low numbers from

regional (19.4%) and rural (2.3%) areas further research is needed on clinicians' experiences in these work settings.

There were also major discrepancies in sample size across disciplines (e.g., very low numbers for rehabilitation physicians and nurses); thus, the sample characteristics do not reflect the staff ratios of clinicians working in TBI practice (Australasian Faculty of Rehabilitation Medicine, 2011). The use of a broader range of recruitment options for each discipline would help to improve the representativeness of different disciplines involved in TBI rehabilitation and hence the generalisability of findings for these professions.

A key limitation of the survey design was the lack of definitions for activities listed within scope of practice and other survey sections. Descriptions were kept brief to ensure the survey was not too lengthy; however, the brevity may have resulted in misinterpretation of items. For example, 44% of rehabilitation physicians indicated that they provide psychotherapy for treatment of a psychological disorder. Feedback on the clarity of items was not gained from a member of each discipline included in the survey prior to distribution. A further design issue was apparent for the demographics section, in which participants were asked the length of time in which they had been working in TBI rehabilitation, but not the length of time since graduation. Therefore, it was not possible to distinguish recently graduated clinicians from more experienced clinicians who recently started working in the TBI field.

Importantly, in-depth data collection and analysis was not possible using the survey methodology employed, which for brevity purposes mainly entailed forced-choice responses rather than open-ended questions. It is recommended that qualitative methodology (e.g., focus groups and/or interviews) be employed in future research to gain a richer understanding of clinicians' experiences in brain injury rehabilitation.

Through such data collection methods it would also be possible to explore facilitators that help optimise rehabilitation practice and gain the perspective of other stakeholders (i.e. family, patients, and hospital and service managers).

Summary and Implications

The findings of this survey of 305 multidisciplinary clinicians working in TBI rehabilitation may help guide the focus of professional development and training initiatives. In particular, the core and discipline-related areas of practice in TBI rehabilitation highlights the value of cross-disciplinary training and professional development initiatives. Despite reporting fewer barriers, clinicians working with clients with mild TBI were less confident in overcoming obstacles to provide effective rehabilitation. Such findings suggest the need for professional training and support initiatives specific to clinicians working with clients with mild TBI. Further, the finding that clinicians with less than two years of experience were less confident in overcoming barriers indicates the value of having training initiatives tailored to clinicians new to working in TBI rehabilitation. More generally, clinicians' professional development preferences involved learning new interventions and therapies, translating research into practice and training regarding several client-specific topics. Workshops were the preferred delivery mode, with qualitative responses highlighting the importance of accessible and affordable options. A priority for future research is to evaluate the impact of professional training initiatives on clinicians' confidence, practices, and client outcomes in TBI rehabilitation.

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Table 1

Internal Consistency of the Clinician Survey (Cronbach's Alpha)

Barrier Categories	No of items	Barriers (<i>n</i> =305) α	Confidence (<i>n</i> =45) α
Total/All Categories	22	0.87	0.95
Client-related	8	0.84	0.92
Family-related	2	0.66	0.84
Client-therapist	3	0.82	0.89
Workplace context	5	0.75	0.91
Professional skill	4	0.81	0.93

Table 2

Principal Components Analysis of the 22 Barrier Items (Rotated Factor Solution)

Barrier category	Barrier / item	Component (communalities)				
		1	2	3	4	5
Client-related	Fatigue	.604	.030	.035	.346	.095
	Lack of self-awareness	.688	.128	.004	-.070	.140
	Memory	.807	.024	.034	-.017	-.063
	Inflexible thinking	.632	.046	.047	.046	.184
	Attention	.749	.127	-.037	.096	-.211
	Language	.632	.088	.019	.309	.186
	Disinhibition	.583	.015	.154	.248	.204
	Emotional lability	.650	.026	.181	.228	.237
Family-related	Family resistance	.262	.100	-.023	.400	.685
	Family support	.181	.084	.063	.069	.833
Client-therapist relationship	Working alliance	.254	.206	.275	.690	.171
	Setting goals	.142	.184	.118	.801	.109
	Engaging client	.168	.136	.130	.813	.072
Workplace context	Caseload	.085	.591	-.002	.237	.206
	Lack of supervision	-.036	.652	.257	.179	-.087
	Multidisciplinary support	.135	.681	.263	.060	.057
	Lack of resources	.094	.700	.098	.093	.022
	Opportunity to provide rehabilitation needs	.053	.726	.119	.036	.016
Professional skill	Lack of professional development	.072	.502	.545	-.056	.125
	Knowledge of evidence based practice	.042	.153	.860	.146	.058
	Lack of skills	.063	.174	.827	.169	-.073
	Unable to keep abreast of new developments	.082	.225	.697	.130	.041
	Eigenvalues	6.24	2.99	1.57	1.35	1.03

Table 3

Demographic Characteristics and Discipline of Clinicians Working in TBI (n = 305)

Characteristics		Sample	
		N	%
Age	20-30	74	24.26
	31-40	95	31.15
	41-50	70	22.95
	51-60	56	18.36
	61+	9	2.95
	Missing	1	0.33
Gender	Female	268	87.87
	Male	36	11.80
	Missing	1	0.33
Discipline	Psychology ^a	85	27.87
	Psychology (general)	6	1.97
	Clinical psychology	16	5.25
	Neuropsychology / Clinical neuropsychology	63	20.66
	Occupational therapy	83	27.21
	Speech pathology	45	14.75
	Physiotherapy	35	11.48
	Social work	17	5.57
	Rehabilitation physician	9	2.95
	Nursing	9	2.95
	Other	22	7.21
Qualification	PhD	34	11.15
	Doctorate	26	8.52
	Masters	79	25.90
	Honours	26	8.52
	Bachelor	129	42.30
	Other	11	3.61

^aPsychologists with General Registration have a Master's degree, five year accredited study sequence and one year internship, or a four year accredited sequence and two year internship. Clinical psychologists and clinical neuropsychologists have a Doctorate in clinical psychology or clinical neuropsychology & minimum of one year of supervision or Master's degree in clinical psychology or clinical neuropsychology & minimum of two years of supervision (Area of Practice Endorsements Registration Standard, 2010).

Table 4

Client and Workplace Characteristics for the Sample (n = 305)

Sample characteristics		<i>n</i>	(%)
Experience with clients with TBI	< 6 months	15	4.92
	6 months - 1 year	25	8.20
	2-5 years	79	25.90
	6-10 years	69	22.62
	11-15 years	31	10.16
	>15 years	85	27.87
	Missing	1	0.33
Client population	Paediatric	42	13.77
	Adult	197	64.59
	Older adult	6	1.97
	Paediatric & adult	8	2.62
	Adult & older adult	47	15.41
	All client types	5	1.64
	Client functional status (injury severity)	Mild	58
	Severe	32	10.49
	Very severe	13	4.26
	Mild - severe	73	23.93
	Severe - very severe	28	9.18
	All client functional status	101	33.11
Average amount of time per week with clients with TBI	< 1 hour	16	5.25
	1-5 hours	52	17.05
	6-15 hours	53	17.38
	16-25 hours	91	29.84
	26-35 hours	48	15.74
	>35 hours	45	14.75
	Work setting	Inpatient private	2
Inpatient public		66	21.64
Outpatient private		7	2.30
Outpatient public		40	13.11
Community service		42	13.77
Private practice		29	9.51
University		3	.98
Other		9	2.95
Multiple settings		107	35.08
Team setting	Multidisciplinary team	226	74.10
	Work independently	39	12.79
	Work in a service with other health professionals	26	8.52
	Other ^a	14	4.59

^aFor example, conducting clinical intervention research with members of other disciplines

Table 5

Clinicians' Scope of Practice in TBI Rehabilitation (n = 305)

Activity	Always / frequently		Sometimes		Total (always and sometimes)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Goal setting	236	77.38	62	20.33	298	97.70
Client or family education	243	79.67	54	17.70	297	97.38
Conduct assessment for rehabilitation needs	254	83.28	37	12.13	291	95.41
Provision of feedback on assessment	209	68.52	78	25.57	287	94.10
Behaviour management and support	100	32.79	157	51.48	257	84.26
Evaluation of rehabilitation outcome	160	52.46	95	31.15	255	83.61
Cognitive rehabilitation	128	41.97	120	39.34	248	81.31
Supportive counselling to enhance adjustment	113	37.05	128	41.97	241	79.02
Case management / coordination of rehabilitation	111	36.39	109	35.74	220	72.13
Return to work/school transition support	80	26.23	138	45.25	218	71.48
Family therapy or support	62	20.33	143	46.89	205	67.21
Hospital to home transition / discharge planning	120	39.34	77	25.25	197	64.59
Education and training in use of equipment or technology (including home modifications)	56	18.36	113	37.05	169	55.41
Group intervention (2+ people with TBI)	33	10.82	107	35.08	140	45.90
Sensory and perceptual skills therapy	39	12.79	100	32.79	139	45.57
IADL training for home and community independence (e.g., driving, public transport, shopping, meal preparation)	65	21.31	66	21.64	131	42.95
Basic ADL (self-care) training	60	19.67	72	23.61	132	43.28
Motor control and / or mobility training	71	23.28	54	17.70	125	40.98
Psychotherapy for treatment of a psychological disorder	43	14.10	49	16.07	92	30.16
Speech / language therapy	50	16.39	29	9.51	79	25.90
Oral motor skills and swallowing training	34	11.15	25	8.20	59	19.34

Table 6

Scope of Practice: Rehabilitation Activities Common to all Disciplines

Activity	Psychology (n=85)		Occupational Therapists (n=83)		Speech Pathologists (n=45)		Social Workers (n=17)		Physio- therapists (n=35)		Rehabilitation Physicians (n=9)		Nurses (n=9)	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
	Goal setting	80	94.12	82	98.80	45	100.00	17	100.00	35	100.00	9	100.00	8
Client or family education	83	97.65	80	96.39	45	100.00	16	94.12	35	100.00	9	100.00	9	100.00
Conduct assessment for rehabilitation needs	78	91.76	82	98.80	45	100.00	16	94.12	33	94.29	9	100.00	9	100.00
Provision of feedback on assessment	80	94.12	80	96.39	45	100.00	15	88.24	33	94.29	9	100.00	7	77.78
Behaviour management and support	80	94.12	66	79.52	36	80.00	15	88.24	25	71.43	9	100.00	8	88.89
Evaluation of rehabilitation outcome	60	70.59	75	90.36	39	86.67	14	82.35	33	94.29	9	100.00	8	88.89

Notes: This table presents activities selected by >70% of clinicians in all disciplines as 'always' or 'sometimes' part of their scope of practice.

Table 7

Scope of Practice: Rehabilitation Activities Related to Discipline

Activity	Psychology (n=85)		Occupational Therapists (n=83)		Speech Pathologists (n=45)		Social Workers (n=17)		Physiotherapists (n=35)		Rehabilitation Physicians (n=9)		Nurses (n=9)	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Cognitive rehabilitation	74	87.06	83	100.00	40	88.89	6	35.29	19	54.29	6	66.67	6	66.67
Psychotherapy for treatment of a psychological disorder	62	72.94	8	9.64	2	4.44	7	41.18	0	0.00	4	44.44	2	22.22
Hospital to home discharge planning	36	42.35	61	73.49	29	64.44	12	70.59	28	80.00	9	100.00	8	88.89
Group intervention (2+ people)	30	35.29	36	43.37	31	68.89	11	64.71	18	51.43	1	11.11	6	66.67
Sensory and perceptual skills therapy	12	14.12	65	78.31	21	46.67	1	5.88	27	77.14	3	33.33	4	44.44
Education and training in use of equipment or technology (including home modifications)	12	14.12	75	90.36	36	80.00	1	5.88	31	88.57	3	33.33	4	44.44
Speech / language therapy	9	10.59	7	8.43	45	100.00	1	5.88	3	8.57	3	33.33	4	44.44
Basic ADL (self-care) training	5	5.88	77	92.77	7	15.56	4	23.53	23	65.71	4	44.44	8	88.89
IADL training for home and community independence (e.g., driving, public transport, shopping, meal preparation)	4	4.71	80	96.39	14	31.11	6	35.29	15	42.86	2	22.22	4	44.44
Oral motor skills and swallowing training	1	1.18	2	2.41	44	97.78	0	0.00	3	8.57	2	22.22	4	44.44
Motor control and / or mobility training	1	1.18	63	75.90	13	28.89	0	0.00	31	88.57	5	55.56	4	44.44
Supportive counselling to enhance adjustment	78	91.76	58	69.88	39	86.67	17	100.00	18	51.43	8	88.89	7	77.78
Return to work/school transition	63	74.12	67	80.72	38	84.44	10	58.82	18	51.43	8	88.89	3	33.33

support														
Family therapy or support	57	67.06	56	67.47	36	80.00	14	82.35	18	51.43	5	55.56	8	88.89
Case management / coordination of rehabilitation	45	52.94	65	78.31	35	77.78	17	100.00	27	77.14	9	100.00	7	77.78

Note: Shading represents activities selected by >70% of clinicians in the discipline as 'always' or 'sometimes' part of their scope of practice.

Table 8

Frequency of Barriers and Average Confidence by Barrier Category

Barrier Category	Barrier	Frequency		Confidence Ratings	
		<i>n</i>	%	<i>M</i>	<i>SD</i>
Client-related	Poor attention / concentration	293	96.07	7.66	1.60
	Memory impairment	291	95.41	7.62	1.63
	Lack of self-awareness	290	95.08	6.82	1.96
	Inflexible or rigid thinking	286	93.77	6.89	1.80
	Fatigue	283	92.79	7.60	1.62
	Disinhibited behaviour	276	90.49	7.00	1.92
	Language difficulties	271	88.85	6.97	2.08
	Emotional lability	269	88.20	7.22	1.84
	Average	282	92.58	7.22	1.81
Family-related	Lack of family support	255	83.61	6.79	1.89
	Family resistance to involvement in rehabilitation	226	74.10	6.70	1.91
	Average	241	78.85	6.75	1.90
Client-therapist relationship	Engaging client in rehabilitation	230	75.41	7.60	1.74
	Setting realistic rehabilitation goals with client	226	74.10	7.72	1.62
	Establishing a good working alliance	185	60.66	8.16	1.56
	Average	214	70.05	7.83	1.64
Workplace context	Large caseload and time constraints	217	71.15	6.47	2.00
	Lack of resources / funding	194	63.61	6.05	2.08
	Lack of opportunity in role to provide the level or type of rehabilitation to client	180	59.02	5.92	2.12
	Limited supervision or support in role	131	42.95	6.75	1.97
	Lack of multidisciplinary collaboration	118	38.69	6.52	2.07
	Average	168	55.08	6.34	2.05
Professional skill	Keeping abreast of new developments in field	188	61.64	6.38	1.85
	Lack of skills to implement evidence based interventions	146	47.87	6.57	1.95
	Knowledge of evidence based interventions	132	43.28	6.70	2.04
	Lack of professional development opportunities	127	41.64	6.54	2.01
	Average	148	48.61	6.55	1.96

Table 9

Results of ANOVA for Average Number of Barriers and Average Confidence Ratings

Variable	<i>n</i>	Average no. of barriers		<i>SD</i>	Average confidence		<i>SD</i>
State ^a							
QLD	93	14.77		4.72	7.04		1.38
NSW	74	15.24		3.83	6.91		1.17
SA	23	17.13		3.76	6.84		1.43
VIC	69	15.84		4.49	7.17		1.28
TAS	16	15.06		5.31	6.37		1.38
WA	26	16.42		2.89	6.75		1.51
ANOVA results		<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2
		1.61	.16	.03	1.24	.29	.02
Age							
20-30	74	15.23		4.76	6.90		1.18
31-40	95	15.17		4.18	6.96		1.20
41-50	70	15.46		4.22	7.15		1.42
51-60	56	16.07		4.04	6.87		1.56
61+	9	16.22		5.26	6.74		1.49
ANOVA results		<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2
		.51	.73	.01	.55	.70	.01
Gender							
Male	36	15.28		4.20	6.92		1.39
Female	268	15.51		4.31	6.98		1.32
ANOVA results		<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2
		.09	.76	.00	.07	.79	.00
Discipline							
Psychology	85	14.07		4.36	6.78		1.31
Occupational therapy	83	15.71		4.12	7.01		1.30
Speech pathology	45	15.89		3.90	7.13		1.37
Social work	17	16.94		3.03	6.87		1.57
Physiotherapy	35	15.71		5.15	7.24		1.05
Rehabilitation physician	9	17.56		3.47	6.77		1.24
Nursing	9	17.00		3.54	7.86		1.64
ANOVA results		<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2
		2.60	.02	.05	1.40	.22	.03
Work geography							
City	239	15.22		4.33	7.00		1.36
Regional area	59	16.05		4.34	6.98		1.15
Rural	7	18.14		2.27	6.08		1.25
ANOVA results		<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2
		2.29	.10	.02	1.62	.20	.01
Work context							

Variable	<i>n</i>	Average no. of barriers	<i>SD</i>	Average confidence	<i>SD</i>		
Multidisciplinary team	226	15.57	4.18	7.00	1.27		
Service with other health professionals	26	16.04	4.90	7.00	1.37		
Work alone	39	14.54	5.08	6.69	1.40		
ANOVA results		<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2
		1.16	.32	.01	.94	.39	.01
Qualification							
PhD	34	14.71	4.54	7.00	1.51		
Doctorate	26	14.15	4.58	6.61	0.99		
Masters	79	15.15	4.23	7.13	1.23		
Honours	26	14.77	4.72	6.73	1.29		
Bachelor Degree	129	15.96	4.16	7.01	1.34		
ANOVA results		<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2
		1.50	.20	.02	1.04	.39	.01
Work setting							
Private	53	14.89	5.14	7.10	1.10		
Public	156	15.35	4.08	6.94	1.24		
Community	42	16.02	3.99	7.23	1.74		
ANOVA results		<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2
		.82	.44	.01	.87	.42	.01
Client population ^b							
Paediatric	42	14.10	5.06	6.95	0.94		
Paediatric and adult	13	15.93	5.85	7.63	1.10		
Adult	197	15.44	4.04	7.02	1.32		
Adult & older adult	53	16.49	4.22	6.69	1.58		
ANOVA results		<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2
		1.5	.19	.02	1.52	.18	.03
Client functional status ^c							
Mild	58	13.93	4.68	6.14	1.52		
Severe	105	15.92	4.42	7.06	1.18		
Very severe	142	15.71	3.97	7.25	1.21		
ANOVA results		<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2
		4.58	.01	.03	16.21	<.001	.10
Years of experience							
<2 years	40	15.05	4.89	6.25	1.42		
2-10 years	146	15.38	4.35	6.92	1.23		
>10 years	116	15.73	4.06	7.30	1.32		
ANOVA results		<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2
		.44	.65	.00	9.99	<.01	.06
Average TBI client							

Variable	<i>n</i>	Average no. of barriers	<i>SD</i>	Average confidence	<i>SD</i>		
Contact p/w							
< 2 days	121	14.98	5.12	6.79	1.32		
2-3 days	91	15.65	3.80	7.19	1.16		
> 3 days	93	15.85	3.60	7.00	1.46		
ANOVA results		<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2
		1.20	.30	.01	2.44	.09	.02

Notes: data for 'other' responses or $n < 5$ were removed from the analyses; ^aACT and NT were excluded from analysis due to insufficient sample size < 5 ; ^bclient population was classified according to the oldest client group worked with; ^cclient functional status was classified according to the most severe injury status identified by the clinician.

Table 10

Average Confidence Ratings According to Client Functional Status and Years of Experience for each Barrier Category

	Client-related			Family-related			Client-therapist relationship			Workplace context			Professional skill		
	<i>M</i>	<i>SD</i>		<i>M</i>	<i>SD</i>		<i>M</i>	<i>SD</i>		<i>M</i>	<i>SD</i>		<i>M</i>	<i>SD</i>	
Client Functional Stats															
Mild	6.44	1.60		6.13	2.00		6.73	1.95		5.34	1.98		5.33	1.96	
Severe	7.22	1.24		6.72	1.69		7.81	1.36		6.54	1.71		6.58	1.66	
Very severe	7.52	1.42		6.95	1.73		7.89	1.41		6.51	1.64		6.67	1.67	
ANOVA results	<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2
	12.10	<.01	.08	3.57	.03	.03	10.34	<.01	.08	9.61	<.01	.07	9.71	<.01	.08
Post-hoc results		<i>p</i>			<i>p</i>			<i>p</i>			<i>p</i>			<i>p</i>	
Mild vs. severe		<.01*			.20			<.01*			<.01*			<.01*	
Mild vs. very severe		<.01*			.02			<.01*			<.01*			<.01*	
Severe vs. very severe		.27			.70			.98			.10			.10	
Years of Experience															
< 2 years	6.56	1.63		5.97	2.02		6.84	2.14		5.67	1.88		5.68	1.95	
2-10 years	7.11	1.35		6.67	1.76		7.64	1.44		6.27	1.71		6.46	1.74	
>10 years	7.58	1.41		7.08	1.64		7.95	1.39		6.55	1.82		6.61	1.71	
ANOVA results	<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2	<i>F</i>	<i>Sig</i>	ηp^2
	8.67	<.01	.06	5.41	.01	.04	6.22	<.01	.05	3.22	.04	.02	3.58	.03	.03
Post-hoc results		<i>p</i>			<i>p</i>			<i>p</i>			<i>p</i>			<i>p</i>	
<2 years vs. 2-10 years		.09			.11			.03			.21			.07	
<2 years vs. >10 years		<.01*			<.01*			<.01*			.04			.03	
2-10 years vs. >10 years		.02			.22			.37			.56			.93	

*Post-hoc significant $p < .01$

Table 11

Professional Development Preferences

Topic	<i>n</i>	%	Mode of delivery			
			Workshop	Conference	Resources	Other
New interventions and therapies	231	75.74	166	109	78	8
Insight or self-awareness	201	65.90	149	56	98	8
Translating rehabilitation research into everyday practice	198	64.92	154	95	72	6
Cognitive function: attention, memory, executive function	194	63.61	164	67	103	5
Behaviour management	180	59.02	144	54	89	6
Measuring the efficacy of rehabilitation outcomes (outcome evaluation)	171	56.07	120	70	78	6
Emotional adjustment	160	52.46	125	45	76	5
Adult rehabilitation	154	50.49	88	54	50	3
Relationships (e.g., intimacy and sexuality)	138	45.25	94	35	69	6
Family well-being	131	42.95	89	36	54	9
Fatigue	129	42.30	82	35	87	5
Conducting research in your clinical context	129	42.30	98	47	49	5
Communication	107	35.08	85	37	53	4
Work	89	29.18	64	32	45	4
Assessment of rehabilitation needs	77	25.25	53	23	28	4
School	68	22.30	47	21	38	2
Working alliance & engagement	65	21.31	44	18	19	5
Paediatric	62	20.33	44	31	22	3
Driving	60	19.67	36	20	25	4
Older adult	52	17.05	35	16	23	1
Self-care and independence	51	16.72	31	17	26	3