



Is it time to act? The potential of acceptance and commitment therapy for psychological problems following acquired brain injury

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Behaviour therapies have a well-established, useful tradition in psychological treatments and have undergone several major revisions. Acceptance and Commitment Therapy (ACT) and mindfulness-based approaches are considered a third wave of behavioural therapies. Emerging evidence for ACT has demonstrated that this paradigm has promising effectiveness in improving functionality and well-being in a variety of populations that have psychological disturbances and/or medical problems. In this review we first evaluate traditional cognitive behavioural therapy (CBT) interventions used to manage psychological problems in distressed individuals who have sustained an acquired brain injury (ABI). We provide an overview of the ACT paradigm and the existent evidence base for this intervention. A rationale is outlined for why ACT-based interventions may have potential utility in assisting distressed individuals who have sustained a mild to moderate ABI to move forward with their lives. We also review emerging evidence that lends preliminary support to the implementation of acceptance and mindfulness-based interventions in the rehabilitation of ABI patient groups. On the basis of existent literature, we recommend that it is an opportune time for forthcoming research to rigorously test the efficacy of ACT-based interventions in facilitating ABI patient groups to re-engage in living a valued and meaningful life, in spite of their neurocognitive and physical limitations. The promising utility of testing the efficacy of the ACT paradigm in the context of multimodal rehabilitation programmes for ABI populations is also addressed.

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INTRODUCTION

On an annual basis, thousands of individuals worldwide sustain an acquired brain injury (ABI) due to: a medical condition or disease, e.g., primary brain tumour; accident or assault, i.e., traumatic brain injury (TBI); or resulting from a degenerative disorder, e.g., dementia. Approximately two-thirds of individuals with an ABI are diagnosed with only mild to moderate brain impairment (e.g., Busch & Alpern, 1998); hence, the majority of these individuals have a good prognosis. Yet, despite this, there is a growing body of research that has evidence that up to 40% of mild to moderately impaired ABI patients experience clinical levels of anxiety and/or depression (e.g., Bowen, Neumann, Connors, Tennant, & Chamberlain, 1998; Schoenhuber & Gentili, 1988; Seel & Kreutzer, 2003; Starkstein, Jorge, Mizrahi, & Robinson, 2005; Wellisch, Kaleita, Freeman, Cloughesy, & Goldman, 2002), hindering physical, functional and social well-being, and overall quality of life. Historically, rehabilitation programmes for persons with ABI primarily focused on cognitive deficits as well as externalising behavioural problems (i.e., behaviours that comprise an acting-out style, such as aggression, non-compliance, and poor impulse control), whilst overlooking the emotional impact and psychosocial adjustment of these conditions. However, in the past 15 years, increasing attention has focused on the psychosocial difficulties, including internalising problems (i.e., problems comprising an inhibitory style, such as anxiety and depressive disturbances) experienced by ABI survivors. It is noteworthy that this more holistic approach to neuropsychological rehabilitation was historically recognised by Goldstein (1959), and pioneering rehabilitation programmes around the world have been developed by Ben-Yishay (1996), Diller (1976), Prigatano (1986) and Wilson et al. (2000). Undeniably, the management of psychological problems for individuals with an ABI is pivotal given that chronic psychological problems not only hamper the quality of life of ABI survivors, but also has broader socio-economic consequences due to reduced social, community, and occupational functioning.

Although certain pharmacological interventions have been documented to decrease anxiety and depressive symptoms in ABI patients, they exacerbate existing psychosomatic symptoms and induce further side-effects including nausea, dizziness, and feelings of derealisation and depersonalisation (Williams, Evans, & Fleminger, 2003). Consequently, in recent years, the focus has turned to psychological interventions to manage emotional problems

following ABI. Cognitive behavioural therapies (CBT) have a strong evidence base for the treatment of anxiety and depression in various clinical and medical populations including (non-brain) cancer survivors (e.g., Osborn, Dementada, & Feuerstein, 2006). A growing number of studies have also evaluated traditional CBT approaches for managing emotional disturbances in several types of ABI populations, including individuals with mild TBI and dementia, many with promising outcomes (e.g., Bradbury et al., 2008). Even so, while CBT can be effective, not all studies that have utilised CBT interventions have found positive effects for managing psychological distress in ABI samples. Mixed (e.g., Hodgson, McDonald, Tate, & Gertler, 2005; Rasquin, Van De Sande, Praamstar, Van Heugten, 2009) and even negative results have also been documented (e.g., Lincoln & Flannaghan, 2003; Ramaratnam, Baker, & Goldstein, 2003).

The traditional CBT paradigm is a multi-modal treatment approach that evolved from behavioural/learning theory. Currently, the evolution of the behavioural therapies can be seen as covering three generations (Hayes, 2004) each of which has relevance to ABI. The first generation encompassed the traditional behaviour therapies based on operant and classical conditioning principles. Such techniques have been used successfully to manage overt behavioural dysregulation following ABI. The second generation comprised the traditional cognitive therapy and CBT interventions, including Albert Ellis's Rationale Emotive Behavioural Therapy (REBT), and Aaron Beck's CBT approaches, which have also been applied to people with ABI and will be discussed further below. Finally, the current, third wave of behavioural therapies include ACT, mindfulness-based therapies, including Mindfulness-Based Cognitive Therapy, and Dialectical Behavioural Therapy (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). The key differentiating principle between the second and third generation of behavioural interventions is that the second wave of traditional cognitive and CBT approaches focus directly on altering psychological events, notably, thoughts, beliefs, perceptions and cognitive schemas (e.g., Beck, 1993); whereas the third wave of therapies aim to change the *function* of these events and the individual's relationship to their psychological and contextual experiences (Hayes et al., 2006). As the premise of ACT-based interventions is on facilitating functional change, this third wave of behavioural interventions may have particular utility for helping distressed ABI individuals to re-engage in living a meaningful life, in spite of their neurological and physical deficits. The purpose of this paper is to review traditional CBT interventions used to manage and/or treat psychological problems (notably, anxiety and mood disturbances) in distressed ABI samples and then to examine whether ACT-based interventions may have additional applicability to ABI populations, especially those that have experienced mild to moderate impairments.

CBT: RE-EXAMINING THE EFFICACY FOR MANAGING EMOTIONAL PROBLEMS IN ADULT ABI POPULATIONS

There are two central tenets to traditional CBT approaches. First, one's cognitions (including thoughts, beliefs, and perceptions) have an influence on one's emotional and behavioural reactions; and, second, one's behavioural responses can also influence one's cognitions and emotions (Wright, Basco, & Thase, 2006). In accordance with the CBT model, cognitions and behavioural reactions are also modulated by biological mechanisms as well as environmental and interpersonal influences (Wright et al., 2006). A common misunderstanding of CBT is that it is simply a mechanistic approach comprising of a set of techniques (Neenan & Dryden, 2004; Wydo, 2001). However, assessment and treatment formulation are integral to CBT (Persons, 2008; Wright et al., 2006).

A key component of formulating a CBT-based treatment plan is setting specific therapy goals that are collaboratively determined and agreed upon by the patient and therapist (Wright et al., 2006). Treatment goals may focus on reducing psychological symptoms (e.g., decreasing anxiety and stress symptoms); and/or may focus on increasing desired behaviours or outcomes (e.g., engaging in more social activities for persons who are isolated). Goals set need to be realistic (e.g., in the context of ABI, curing a chronic disability may not be realistic, however, improving functioning by getting a part-time job suitable to one's current functioning and/or resuming daily activities is a more realistic goal in terms of improving functional well-being); and must also be measurable (Persons, 2008). Indeed, a collaborative therapeutic relationship is central to CBT, as is the use of Socratic questioning when utilising cognitive methods, particularly cognitive restructuring techniques, in order to identify and modify unhelpful and/or maladaptive automatic thoughts and underlying schemas (Neenan & Dryden, 2004; Wright et al., 2006). Other key components of CBT comprise the use of structuring sessions, psychoeducation and rehearsal to enhance learning, as well as behavioural methods including imaginal and in vivo exposure, relaxation and problem-solving techniques (Hawton, Salkovskis, Kirk, & Clark, 1989; Wright et al., 2006).

The potential benefits of CBT techniques for people with ABI have been increasingly recognised due to (1) their effectiveness in other clinical populations, and (2) the relatively structured, time-limited and practical focus on concrete behaviours and thoughts that provide the scope to bypass cognitive deficits. In order to accommodate even mild cognitive impairments following ABI, modifications to traditional CBT-based interventions are strongly recommended (Khan-Bourne & Brown, 2003; Mateer & Sira, 2006). Modifications include the provision of written material, prompts, repetition, and summarising of information (Anson & Ponsford, 2006; Khan-Bourne & Brown, 2003).

Studies utilising either traditional or modified CBT approaches have been conducted in the past 10–15 years to evaluate CBT interventions for emotional problems in distressed persons who have sustained an ABI. A number of these CBT intervention studies report positive outcomes, improving emotional well-being in distressed (including anxious, traumatised and/or depressed) ABI patient samples. For example, several single case reports have reported beneficial outcomes for traditional CBT-based interventions for the treatment of obsessive-compulsive disorder (OCD) (Williams et al., 2003a), post-traumatic stress disorder (PTSD) (Williams, Evans, & Wilson, 2003b), seizure-related panic attacks (Gracey, Oldham, & Kritzinger, 2007), and depression (Mateer & Sira, 2006), in adults recovering from ABI. There are also a number of group studies reporting positive outcomes. For example, Bryant, Moulds, Guthrie, and Nixon (2003) used a randomised controlled design to test the efficacy of a brief, five-session, individualised CBT intervention for the treatment of acute stress disorder in persons who had sustained mild TBI ($N = 24$). Participants were randomly allocated to either the CBT programme or a non-directive supportive counselling intervention. Significantly fewer individuals (8%) met the criteria for PTSD post-CBT intervention compared to persons who received the counselling intervention (58%). Effects for the most part were retained at 6-month follow-up although depressive symptoms did not improve. The efficacy of this trauma-focused CBT programme for people with TBI is in line with the broader strong evidence base for trauma-focused CBT in ameliorating PTSD in other civilian populations (e.g., Nemeroff et al., 2006).

In a more recent study, utilising a matched-control trial, Bradbury et al. (2008) tested the efficacy of an 11-session CBT programme to reduce distress and improve coping and community integration compared to a psycho-educational programme. Results indicated that individuals with ABI ($n = 10$) who received the CBT intervention experienced a significant reduction in overall distress symptoms compared to individuals ($n = 10$) who received the educational programme; and up to 80% of participants in the CBT condition reported normative levels of distress post-intervention. No significant gains were found for coping skills and community integration for participants who received the CBT programme. Hence, improvements in emotional well-being did not seem to extend to improvements in functionality. In yet another empirical study, Tiersky et al. (2005) tested the efficacy of a combined individual-based CBT and cognitive remediation programme with a small sample ($N = 20$) of emotionally distressed TBI patients. The CBT arm of the remediation programme entailed 50-minute sessions, 3 days per week over 11 weeks. Cognitive functioning returned to normal levels post-intervention. Although anxiety and depressive symptoms also improved post-therapy, only anxiety symptoms returned to normal levels, whilst depressive symptoms remained at clinical levels. No improvements in functionality were

evident. Indeed, the researchers concluded that participants in their sample “remained emotionally distressed and functionally impaired despite improvement in cognitive functioning” (p. 1572).

These studies do suggest that traditional CBT, with some modifications to ameliorate the problems associated with cognitive impairment, can be effective. However, the evidence is not universally positive, with other studies reporting mixed findings (i.e., both positive and negative outcomes; e.g., Anson & Ponsford, 2006; Hodgson et al., 2005; Lincoln, Flannaghan, Sutcliffe, & Rother, 1997), or negative outcomes (e.g., Lincoln & Flannaghan, 2003). The variable results across studies is, in part, due to design and sampling variations including differences in ABI patient samples, inclusion/exclusion criteria, and specific CBT components included in the multi-modal programmes, as well as variations in research aims. Moreover, the majority of these studies are hampered by methodological limitations, including small sample sizes (typically $< N = 30$) and paucity of longer-term follow-up assessments (beyond the 1–2 month post-intervention period). Importantly, only a very limited number of studies have utilised the gold standard of a randomised controlled trial (RCT) design (Bryant et al., 2003; Hodgson et al., 2005), with the greater proportion of intervention trials reliant upon single-case series (including case reports), or non-RCT group designs (Soo & Tate, 2007).

Nevertheless, the lack of consistent benefit seen for the application of CBT to people with ABI does raise the question as to whether traditional CBT is always the best choice for this population. In particular, while many facets of CBT are well suited to modification to circumvent cognitive deficits, some core strategies in CBT are inherently cognitively demanding (Aeschleman & Imes, 1999). Cognitive restructuring (CR), in particular, is a central component of CBT that entails identifying, evaluating, challenging and replacing negative, dysfunctional thoughts with more adaptive, realistic thinking (Beck, 1993; Mansell, 2008). CR is a meta-cognitive strategy that, by its nature, is abstract and therefore likely to be challenging for those with cognitive impairments that compromise attention, working memory, information processing speed and/or executive dysfunction. The majority of ABI studies that have evaluated CBT use traditional approaches (e.g., Beck, Rush, Shaw, & Emery, 1979; Hawton et al., 1989) that include CR strategies (e.g., Anson & Ponsford, 2006; Bryant et al., 2003; Lincoln et al., 1997; Lincoln & Flannaghan, 2003; Rasquin et al., 2009; Tiersky et al., 2005). While there is limited evidence as to how the inclusion of such strategies impact upon efficacy, a few studies have reported direct evidence related to participant perceptions.

Firstly, in a recent study by Anson and Ponsford (2006), feedback was sought regarding how well participants understood and applied principles covered in CBT therapy aimed at improving their emotional adjustment

and coping post-ABI. Between 23–40% of the group ($N = 33$) reported that their understanding and implementation of skills had improved to a moderate extent or better. The remainder reported much smaller gains and a minority reported no change at all. The CBT programme tested by Anson and Ponsford (2006) was found to significantly improve adaptive coping in participants at the end of therapy; however, a waning and waxing effect for coping was found at 5 weeks, and 2 years follow-up, respectively. No significant reduction in anxiety or depressive symptoms, or improvements in self-esteem and overall psychosocial well-being was found. One complication in this study was that emotional distress was not a specific inclusion criterion in this study limiting the scope for the study to demonstrate efficacy of CBT techniques on alleviating distress. Notwithstanding this methodological limitation, the study findings suggest that more than 50% of the TBI patients involved experienced difficulty in understanding and therefore implementing CR strategies.

In another RCT study by Hodgson et al. (2005), the effects of an individual-based CBT programme was tested in terms of reducing social anxiety and improving emotional well-being in a small sample of socially anxious individuals ($N = 12$) who had sustained various types of mild ABIs at least 12 months prior. The CBT programme was modified to accommodate mild cognitive deficits using shorter therapy sessions, frequent repetition of material, provision of information in a structured format, use of visual aids, simplification of CR strategies, including use of guided self-talk and role plays to promote procedural learning. Participants in the CBT programme ($n = 6$) were compared to a group of participants ($n = 6$) randomised to the wait-list control condition. Individuals in both conditions experienced a significant improvement in social anxiety post-intervention; however, the CBT intervention was found to have a stronger effect size and these effects were maintained at 1-month follow-up. With the exception of assertiveness training, the bulk of the programme comprised traditional CBT segments including relaxation, graded exposure and simplified CR strategies. Participants had minimal difficulties understanding and implementing the behavioural components, including relaxation, exposure and assertion training but did report difficulties understanding the abstract concepts involved with the CR segments of this programme.

Other evidence for the potential difficulties experienced by people with ABI when using CR techniques is more indirect. Rasquin et al. (2009) documented mixed findings for the CBT intervention they applied to distressed individuals who had sustained a stroke. Using a single-subject quasi experimental design ($N = 5$) to address emotional complaints, each participant was provided with eight weekly sessions of the CBT programme which appeared to include CR (i.e., “patients [were taught] how to recognise negative thoughts and to challenge them”; p. 210), relaxation strategies, and

pleasant activity scheduling. At the completion of therapy, three of the five patients evidenced clinically significant improvements in their mood, whilst two participants experienced no change in depression. Furthermore, three participants experienced no shift in quality of life, and four of the participants were found to have nil improvement in general distress at the completion of therapy. In another study, Lincoln and colleagues (1997), using an AB single case experimental design for a series of cases ($N = 19$) and later a large RCT ($N = 123$; Lincoln & Flannaghan, 2003), evaluated traditional CBT for individuals experiencing depression after stroke. Findings from both studies were variable echoing Rasquin et al.'s (2009) results. Indeed, in the larger RCT no significant improvements in depression were evidenced for participants who received the CBT intervention, compared to individuals who received the placebo conditions. In both studies the researchers noted that participants who evidenced more difficulties with memory and reasoning abilities did not benefit from the CBT intervention. In addition, Lincoln et al. reported that the cognitive strategies were the most challenging for participants to implement.

In summation, although there is evidence that traditional CBT-based programmes have utility for certain ABI patient groups in terms of reducing stress (e.g., Bryant et al., 2003; Williams, Evans, & Fleminger, 2003; Wilson, Evans, & Wilson, 2003) and mood symptomatology (e.g., Mateer & Sira, 2006), the efficacy of CBT in treating emotional problems following ABI is not uniform across studies. Notably, the majority of RCT interventions have documented mixed outcomes. From the evidence reviewed, it is possible that inclusion of CR techniques may have contributed to the variable results even when these techniques were simplified to accommodate cognitive deficits of the ABI samples. Several studies cited evidence that at least a proportion of individuals with ABI struggled to understand and/or implement the cognitive procedures (e.g., Anson & Ponsford, 2006; Lincoln et al., 1997; Lincoln & Flannaghan, 2003). This is a pivotal issue as the inability to understand and/or consistently implement cognitive skills may have reduced the focus and potency of the behavioural components of treatment, and thus hindered the efficacy of the overall CBT programme.

There is growing evidence that within CBT, it is the behavioural-based interventions that are instrumental in the treatment of anxiety and depressive problems and enhancing the quality of life in various non-ABI, clinical and medical populations (e.g., Borkovec, Newman, Pincus, & Lytle, 2002; Hopko et al., 2008). In fact, a number of dismantling and component studies of CBT have shown that CR contributes minimal additive benefits to behavioural components across several clinical populations (Borkovec et al., 2002; Longmore & Worrell, 2007; Lovell, Marks, Noshirvani, Thrasher, & Livanou, 2001). Furthermore, in the context of recovering from an ABI, it could be argued that CR strategies are contra-indicated for

individuals who are coming to terms with primarily negative appraisals grounded in the reality of lifestyle change. That is, it is understandable that a proportion of individuals with ABIs may experience reduced mood and elevated distress as they try to come to terms with the limitations imposed by their ABI deficits in their daily, occupational and interpersonal functioning. For these reasons, the new, “third-wave generation” of behavioural psychotherapeutic approaches, particularly Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999; Hayes, 2004) and mindfulness-based approaches, may offer new possibilities for the treatment of emotional problems in distressed ABI patient groups, particularly individuals who have only experienced a mild to moderate ABI. To our knowledge, no study to date has specifically tested the efficacy of ACT in ABI populations. Hence, in the first instance, the efficacy of ACT interventions needs to be tested with patients who have sustained mild to moderate brain impairments in order to validate whether the core processes of ACT (reviewed below) can be effectively implemented by persons with only mild to moderate ABIs, before proceeding to test this intervention with individuals who have more severe cognitive deficits.

ACCEPTANCE AND COMMITMENT THERAPY (ACT)

Core processes of ACT interventions

ACT, with its foundations in behavioural principles, is conceptually grounded in functional contextualism (Hayes, Bissett, et al., 1999). Hence, it is considered to be a contextual-based cognitive behavioural therapy. It also shares some features associated with Gestalt and emotion-focused psychotherapies, as well as with Eastern meditative practices (Hayes, Strosahl, et al., 1999). The theoretical underpinnings for the ACT paradigm are based on Relational Frame Theory, which focuses on how environmental interactions influence a wide range of human thoughts and behaviours (Hayes, Barnes-Holmes, & Roche, 2001). For example, Relational Frame Theory uses Pavlovian and operant conditioning to explain spontaneous and apparently uncontrolled human anxiety responses. Thus, a person who experiences terrible bouts of sea-sickness, may elicit a spontaneous aversive anxiety response to the word “boat” as well as to other verbal (e.g., sea, waves), and non-verbal, contextual stimuli (e.g., smell and sounds of the ocean) associated with boats and seasickness (Hayes, 2004). Similarly, a person who is traumatised or highly distressed by their brain tumour may experience adverse reactions to verbal and other contextual cues associated with their medical treatment experience, such as viewing cancer advertisements or news about brain items in the media. The tenets of Relational

Frame Theory have been empirically substantiated with over 70 empirical studies to date examining their validity in explaining a wide array of psychological phenomenon including anxiety, depression, self-awareness, self-concept, and rule following (Hayes et al., 2006). In line with this theory, a shift in context that supports the relations between thought, action, and emotion is necessary in order to initiate change. To this end, ACT conceptualises “psychological events as a set of ongoing interactions between the organism and historically and situationally defined contexts” (Hayes, 2004, p. 646).

The acronym “ACT” has dual meanings: “Acceptance and Commitment Therapy” pertains to the descriptive formal name of this therapeutic paradigm which focuses on acceptance of human suffering and commitment to living a purposeful life. The second meaning of ACT describes its three core components: (1) Accept what an individual has and cannot be changed; (2) Choose valued life directions; and (3) Take action to live a meaningful life (Hayes, Bissett, et al., 1999). Importantly, one of the central premises of ACT is to *improve functionality* rather than focus on symptom reduction per se. Although there are commonalities between ACT and traditional CBT interventions (Arch & Craske, 2008; Heimberg & Ritter, 2008) because ACT does *not* include CR techniques it circumvents the logistical and feasibility problems inherent in applying such techniques in populations that are cognitively challenged.

ACT adheres to a health rather than illness model (Hayes, Strosahl, et al., 1999). Emotional problems are acknowledged to be an inevitable part of living and therefore deemed to be a universal human experience. Accordingly, the core goal of ACT is to facilitate individuals to live a purposeful and meaningful life, by focusing and engaging with their goals and values whatever their personal circumstances (Forsyth & Eifert, 2007). In accordance with ACT principles, the focus for distressed individuals with an ABI would be to try to live a valued life, taking into account the limitations imposed by their physical and neurological deficits. For example, if an ABI individual values being part of a loving family and social network, the goal would be to continue or “re-engage” in activities that they can still do (in spite of their neurological deficits) with their family members and close friends, and which enable them to be loving and caring towards people who are important to them. As previously noted, a core feature of traditional CBT is collaborative goal setting, which is typically addressed during the treatment formulation phase (Persons, 2008). Hence, the goal setting approach in CBT is compatible with the evaluation of client goals in ACT programmes. However, a major divergence between these two therapeutic models is that traditional CBT approaches tend to focus on controlling or eliminating anxious or distressing thoughts and feelings (e.g., via cognitive strategies such as CR), whilst ACT trains the individual to live with such

thoughts. In particular, ACT-based interventions “teach clients to feel emotions and bodily sensations more fully and without avoidance, and to notice fully the presence of thoughts without following, resisting, believing or disbelieving them” (Hayes, Bissett, et al., 1999, p. 1). Essentially, whereas ACT focuses primarily on altering the functionality of cognitions, traditional CBT that includes CR methods focuses on altering the form and frequency of cognitions (Hayes, Bissett, et al., 1999).

ACT views psychological inflexibility as a central feature of emotional disturbances. Hence, psychological flexibility is established via six core processes that are conceptualised as positive psychological skills (Hayes et al., 2006). The six core processes include acceptance, cognitive defusion, contact with present moment, self-as-context, values, and committed action. These processes are not linear; rather they overlap and are inter-related and collectively facilitate psychological flexibility (Hayes et al., 2006). The core principle of acceptance entails learning to accept both positive and negative feelings and thoughts, particularly pertaining to events and circumstances one has no control over or cannot change. For example, anxious individuals are taught to feel anxiety fully without defence (Forsyth & Eifert, 2007). Similarly, persons with somatic problems (e.g., chronic pain) are taught methods to let go of the struggle with pain in order to live a meaningful life (Wicksell, Ahlqvist, Bring, Melin, & Olsson, 2008).

The principles of ACT have been applied to a diverse range of populations (Pull, 2008). In a recent study, an ACT intervention was administered to individuals of low socio-economic status from South Africa who had epilepsy, in order to improve the management of their seizures as well as enhance their well-being and life satisfaction (Lundgren, Dahl, Melin, & Kies, 2006; Lundgren, Dahl, & Hayes, 2008). In this study, individuals were taught acceptance strategies to help them to become aware of and habituate to the sensations of an impending seizure attack, as well as making room for thoughts and feelings associated with their anticipatory fears of seizures, in place of adopting avoidant reactions.

As the second core principle, cognitive defusion techniques aim to alter the undesirable function of thoughts, rather than trying to alter their form and frequency, as is the case with CR strategies. That is, individuals are taught to view the process of thinking in a more mindful way without disputing the content of the thought itself. For example, in the Lundgren et al. (2006) epilepsy study, cognitive defusion was used to teach patients how to view their distressing thoughts about their seizures (including anticipatory fears of having the next seizure) from a different perspective. This entailed learning to view thoughts as simply thoughts (that will come and go) instead of giving weight to the content of the thoughts that, otherwise, posed obstacles to living in accordance with each individual’s values (Lundgren et al., 2008). That is, the more attention is given to upsetting thoughts, the more potent

negative influence they will have on functioning. In contrast, by learning experientially to let upsetting thoughts come and go, the less influence they will have on well-being as the individual will experientially habituate to their content. In this way, in the Lundgren et al. study, cognitive defusion techniques curtailed avoidance reactions that have been found to have detrimental effects on both emotional and physical well-being.

The third ACT principle of being present in the here and now is facilitated by learning brief mindfulness exercises which can be efficiently applied in relevant situations. By learning to be focused on being present-in-the-moment, individuals are able to interact with their experiences and environment in a non-judgemental manner. In the context of Lundgren et al.'s (2006) study, patients with epilepsy were encouraged not to struggle with, nor resist, their thoughts, feelings and sensations pertaining to their seizures. This enabled individuals to learn experientially that their world and their sense-of-self encompasses more than just being a "person with epilepsy".

The fourth component, "self-as-context" is also facilitated by applied mindfulness and experiential exercises. This component teaches individuals how to differentiate between their physical/somatic and psychological experiences relative to the essence of self. Referring to the epilepsy studies, once again, patients learned to view their medical condition as just one aspect of their life among other important and meaningful components (Lundgren et al., 2008). By doing so, individuals were able to view their goals and values more objectively without being attached to the sole identity of "being an epileptic". This process has particular utility for ABI patient groups as studies have revealed that individuals who have sustained a TBI have reported changes in sense-of-self (Tyerman & Humphrey, 1984), as well as loss of sense-of-self (Meili & Kabat-Zinn, 2004; Nochi, 1998). ACT and mindfulness-based approaches may therefore have utility in facilitating persons recovering from a TBI to regain their sense-of-self.

The fifth component of ACT addresses values, defined as "chosen qualities of purposive action" (Hayes et al., 2006, p. 8). This component helps patients to identify valued life goals and implement them in the face of obstacles (Hayes, Bissett, et al., 1999). In the context of neurological and physical impairments, this can be achieved by the therapist guiding individuals to think of ways to pursue their "valued" goals whilst accommodating their deficits. Although values and goals are related, they are also distinct. Whereas goals have an end (e.g., getting a job), values are a lifelong process or part of one's life journey (e.g., being a caring friend or partner, taking part in social activities, or engaging in work that is stimulating). To assist patients identify their values a "life compass" (valued directions) is typically presented in the format of a user-friendly worksheet (e.g., Forsyth & Eifert, 2007). This involves getting the client to consider values in up to 10 domains including work (i.e., getting the client to identify what is important

about work for them, such as interacting or helping people); intimate/personal relationships (e.g., wanting to be a caring and loving partner); parenting (e.g., wanting to be a parent that takes part in their child's extracurricular activities); education/learning/personal development (e.g., continuing to learn skills of interest, such as training in floristry); social life (wanting to be a caring friend); health/physical care (e.g., engaging in physical exercise to regain and maintain health); family relationships (other than marriage or parenting); spirituality (e.g., does the client have faith values?); community life/environment/nature (e.g., being outdoors and/or being involved with community groups); and recreation/leisure (e.g., enjoying the social aspects of playing soccer or basketball). Although these 10 broad life domains may be presented to the patient, this does not mean that the individual has to value something in every single domain. Also some domains may not be applicable to certain individuals (e.g., parenting).

The final component of ACT comprises committed action; that is, taking effective action that moves clients towards directions in various life domains they value. This component comprises conventional behavioural strategies to initiate and maintain behavioural change. Methods include exposure, skills acquisition, shaping methods and goal setting. Accordingly, once individuals select their values, the next steps entail ranking the importance of each value as well as generating goals that would manifest each value (Hayes, Bissett, et al., 1999). For instance, if an individual with a TBI was seeking to return to work following an accident because he or she valued the stimulation as well as helping people, one goal set to live by this value may include undertaking vocational rehabilitation to help the person obtain a job that accommodates his or her physical and cognitive deficits. To this end, the therapist needs to facilitate this process by helping the client to identify and consider external environmental as well as intrapersonal physical and psychological barriers in working towards this valued goal.

In summary, the key processes of ACT entail learning or re-learning to act in accordance with one's values in order to improve one's functionality and overall quality of life, (despite one's shortcomings and deficits). Essentially, ACT is a process-oriented approach to learn to re-engage in living a valued and purposeful life. An advantage of ACT over traditional CBT is that it does not require cognitive restructuring, a meta-cognitive process that is potentially very difficult for people with cognitive impairments to understand and implement. It also does not put the expectation on clients that they should attempt to challenge negative, although often realistic, thoughts related to their changed life circumstances. This is not to say that ACT approaches will necessarily be suitable for people with severe cognitive impairment. In order to implement all six core dimensions of ACT (especially cognitive defusion and acceptance-based strategies), participants do require a level of cognitive awareness and flexibility. Hence, as noted earlier, in the first instance,

the efficacy of ACT needs to be tested with persons who have sustained a mild to moderate ABI.

Evidence base for ACT interventions

A growing evidence base of controlled studies has demonstrated that ACT is effective in the treatment of depression and anxiety disorders (e.g., Foreman, Herbert, Moitra, Yeomans, & Gellar, 2007; Roemer, Orsillo, & Salters-Pedneault, 2008; Zettle & Hayes, 1986). In particular, Roemer and her colleagues (Roemer & Orsillo, 2007; Roemer et al., 2008) have demonstrated the benefits of ACT in the treatment of generalised anxiety in clinical populations. Notably, in their most recent published RCT study, the ACT intervention was effective in reducing generalised anxiety and comorbid depressive symptoms, as well as significantly improving end-state functioning in individuals experiencing generalised anxiety problems (Roemer et al., 2008). These effects were maintained at both 3 and 9 month follow-up. Given that generalised anxiety and depression are common psychological problems following ABI (Bowen et al., 1998; Hiott & Labbate, 2002), ACT has a potentially useful role to play in remediation. Furthermore, ACT interventions have been found to be effective in the self-management of diabetes symptoms (Gregg, Callaghan, Hayes, & Glenn-Lawson, 2007), addictions (smoking and illicit drug use) (Gifford et al., 2004; Hayes et al., 2004), chronic pain (e.g., Dahl, Wilson, & Nilsson, 2004) including whiplash-associated disorders (Wicksell et al., 2008), trichotillomania (Woods, Wetterneck, & Flessner, 2006), and psychotic symptoms (Gaudiano & Herbert, 2006). These findings further lend support to the application of ACT in a diverse range of patient groups with psychological disturbances, medical conditions, or both.

Not only does ACT appear to be effective for a range of clinical and medical conditions, but the magnitude of the effect is impressive. Hayes and colleagues (2006) conducted a meta-analysis of ACT interventions which utilised controlled methodology. The effects of ACT interventions on psychological outcomes (including anxiety and depressive symptoms) were examined across 32 studies ($N = 6628$), and an overall weighted effect size (ES) of .42 was evident. Eight studies measured depressive outcomes, and a moderate aggregated ES was indicated (.50). A moderate aggregated ES was also found for anxiety (.50), based on five studies. The second part of Hayes et al.'s review examined the efficacy of ACT intervention trials compared to (1) other types of interventions (including CBT), and (2) wait-list and treatment-as-usual control conditions. An overall weighted average ES of .66 was found at post-treatment ($K = 21$ studies, $N = 704$ participants) as well as at longer-term follow-up ($K = 4$, $N = 580$). Twelve studies ($N = 456$) were identified that compared ACT interventions to other types of structured therapeutic

interventions, including traditional CBT, and a weighted moderate effect was indicated at post-intervention ($ES = .48$), whilst a stronger effect was found for retention of effects at longer term follow-up ($ES = .63$; $K = 9$; $N = 404$). Furthermore, a strong effect was found for ACT interventions compared to wait-list, or treatment-as-usual at post-intervention ($ES = .99$; $K = 9$; $N = 248$) as well as at follow-up ($ES = .71$; $K = 4$; $N = 176$).

It is noteworthy that stronger effects were evidenced for ACT interventions which were conducted with patient samples experiencing more severe psychological disturbances and medical conditions, including individuals with psychosis (Guadiano & Herbert, 2006; $ES = 1.11$), self-harming patients diagnosed with borderline personality disorder (Gratz & Gunderson, 2006; $ES = .98$), individuals with depression (Zettle & Hayes, 1986; $ES = 1.23$), chronic pain patients (Dahl et al., 2004; $ES = 1.17$), and individuals with epilepsy (Lundgren et al., 2006; $ES = 1.43$). Collectively, the findings from Hayes et al.'s (2006) meta-analysis demonstrates good preliminary support for the efficacy of ACT interventions in assisting individuals diagnosed with a wide range of psychological and somatic problems. In several updated systematic reviews, the efficacy of ACT interventions continues to be supported across a wide range of medical and clinical populations (Pull, 2008; Ruiz, 2010). On the basis that ACT interventions to date have been found to be effective with individuals experiencing more severe psychological and physical deficits, this outcome has important implications for the potential utility of ACT to be applied to persons with mild to moderate ABI who are experiencing heightened psychological distress and adjustment-related disturbances.

UTILITY OF ACCEPTANCE AND MINDFULNESS-BASED INTERVENTIONS IN ABI

No published study to date has tested the efficacy of an ACT intervention that explicitly incorporates all six key processes of this paradigm with an ABI population. There are, however, two lines of preliminary evidence to support utilising acceptance and mindfulness-based approaches for ABI patient groups. In particular, the processes of cognitive defusion, present awareness, and self-as-context have been reported separately in different mindfulness-based clinical applications involving individuals with an ABI.

The first line of evidence is indicated from Bédard et al.'s (2003) mindfulness-based intervention trial for TBI patients. This pilot study investigated the effectiveness of a mindfulness-based group-support intervention for individuals (aged between 18 and 65 years) who had sustained a mild or moderate TBI, with the aim of improving quality of life, reducing depressive symptoms, and increasing the sense of control patients experienced over their lives;

although participants were required to not be experiencing any major mental health disorders. This 12-week group intervention was manualised and based on Jon Kabat-Zinn and colleagues' (Kabat-Zinn, 1990; Kabat-Zinn Lipworth, & Burney, 1985) mindfulness-based stress reduction therapy as well as Kolb's (1984) experiential learning paradigm. Kolb's experiential theory is a four-stage cyclical model that combines experience, perception, cognitions and behaviour. Although Bédard et al. did not report what components of Kolb's theory were incorporated into their mindfulness-stress reduction intervention, it was noted that the emphasis of their intervention programme was on developing present moment awareness as well as acceptance by using insight meditation, breathing exercises, guided visualisation and group discussion. In particular, through self-exploration and group discussion, patients were encouraged to view their TBI-related disabilities from a new perspective facilitated by approaching life via acceptance in order to move forward with their life (Bédard et al., 2003). Accordingly, the therapeutic framework utilised in this pilot study is comparable with ACT processes; notably, the core processes of acceptance, contact with present moment, and self-as-context.

Ten eligible participants who completed Bédard et al.'s (2003) intervention (and who were between 3 and 10 years post-TBI), were compared to three participants who dropped out of treatment. Results indicated that the TBI patients who completed the intervention had a substantial improvement in overall quality of life ($p < .05$), as well as experiencing a reduction of depressive symptoms ($p = .059$), reporting a significant decline in cognitive-related mood symptoms ($p = .029$) compared to participants who did not complete therapy. No change, however, was evident in participant functioning post-intervention (assessed by the Community Integration Questionnaire). This research needs to be replicated given that this study had several notable methodological limitations including a very small sample of TBI patients ($N = 10$). Moreover, the researchers did not use an RCT design, relying upon a comparison group comprised of the individuals ($N = 3$) who dropped out of treatment and who agreed to take part in the follow-up assessment. In addition, individuals with clinical levels of depression and/or anxiety were excluded from this trial, limiting the trial to those who were already coping adequately with their TBI experience.

The second line of preliminary evidence comes from a survivor of TBI, Trisha Meili, who survived a brutal physical and sexual assault in 1989 (Meili, 2003; Meili & Kabat-Zinn, 2004). Trisha Meili's identity was only revealed in 2003. Prior to this her brutal attack received international media coverage with her case referred to as the "Central Park Jogger", as her attack took place on the evening (between 9 p.m. and 9.35 p.m.) of April 19, 1989 in Central Park, New York. Following this attack, Trisha was comatose for 12 days with an initial Glasgow Coma Score of between

4 and 5 points (Meili & Kabat-Zinn, 2004). She sustained multiple contusions in the left frontal and right temporal/occipital regions with signs of diffuse brain damage as indicated on EEG reports. She also had multiple left orbital fractures and severe left facial and mouth lacerations (Meili & Kabat-Zinn, 2004). She experienced retrograde amnesia, with loss of memory from 5 p.m. on the day of her attack until 6 weeks post-injury. Seven-weeks post-injury and shortly after coming out of her coma, Trisha was transferred to a rehabilitation hospital.

What is unique about Trisha Meili's case is that although her prognosis was very poor, given the extent of her brain injuries, she made a remarkable recovery by the time she revealed her identity in 2003, 4 years following her attack (Leskowitz, 2004). During the early phases of her rehabilitation, Trisha innately trained herself to "develop an attitude of mind" that was compatible with meditative principles (Leskowitz, 2004, p.4). In Trisha's own words she reported that she learned "to live in a new body – mentally, physically and emotionally" and although her "body is different" since the attack, it is "not necessarily worse" (Meili & Kabat-Zinn, 2004, p. 11). Notably, she learned to accept the changes in her physical being whilst being committed to moving forward in terms of regaining her sense-of-self and values by living in the present; rather than being fixated on the past, and ruminating on why the attack happened to her. Indeed, Trisha reported that "living in the present and accepting her reality" was integral to her healing (Meili & Kabat-Zinn, 2004, p. 11). This was facilitated by applying acceptance and mindfulness-based practice. While she innately applied these principles at the beginning, she later received tutelage from Kabat-Zinn in the application of mindfulness meditation training (Leskowitz, 2004).

Trisha Meili's recovery from her TBI appears to have been facilitated by practising mindfulness and acceptance-based practices, including contact with present moment, self-as-context, and committed action to living a valued life. Moreover, given she had sustained a severe TBI her substantial overall recovery lends further support to the potential of mindfulness-based interventions for emotional problems after ABI. Jon Kabat-Zinn's reflection of what rehabilitation entails and the role of mindfulness practices in rehabilitation is noteworthy. In particular he asserts that the term "rehabilitation" has at least two inter-related meanings; the first common meaning denotes "to re-enable" or to "do again what for a time we have been unable to do" (Meili & Kabat-Zinn, 2004, p. 8). The second meaning is derived from the roots of the term "habitat" which denotes "to inhabit, to dwell inside", hence meaning "to learn to live inside again" which attests to learning to become sensitive to the interior processes of what is taking place inside the body, post-injury, during rehabilitation (Meili & Kabat-Zinn, 2004, p. 11). Acceptance of these changes is therefore an important step in rehabilitation, in order to learn or re-learn to live inside again. Indeed, Trisha Meili's

experience reflects that applying acceptance and mindfulness-based practices can facilitate this process of healing and regaining a sense-of-self and purposeful existence.

ACT in context of rehabilitation programmes

While ACT has developed from the general clinical literature, many of its principles are, in fact, compatible with the aims of the holistic neuropsychological rehabilitation programmes established worldwide (e.g., Ben-Yishay, 1996; Prigatano, 1986; Wilson et al., 2000) as well as more recent innovations in brain injury remediation programmes (Wilson, 2008, 2010). Notably, four of the core ACT principles (acceptance, self-as-context, valued goals, and committed action) seem to be incorporated in the multidisciplinary programmes conducted in the holistic rehabilitation setting. However, as outlined previously, the six core processes of ACT also include present-moment awareness and cognitive defusion. Collectively, these six core interactive processes are aimed to enhance psychological flexibility in order to assist individuals struggling with emotional and/or psychosocial problems. To this end, an ACT-based psychotherapy programme for distressed TBI patients would necessitate including all six core components within the same programme.

Furthermore, the majority of the ACT principles are also encompassed within the metaphoric identity mapping (MIM) model pioneered by Ylvisaker and colleagues (Ylvisaker & Feeney, 2000; Ylvisaker, McPherson, Kayes, & Pellett, 2008). This approach is postulated to facilitate identity re-construction, goal setting and re-engagement for persons who have sustained a TBI (Ylvisaker et al., 2008). The MIM approach focuses on (1) identity reconstruction following a TBI, with emphasis on focusing on “actual self” in the here-and-now, versus “possible/hoped-for-self”, which may be unattainable; and (2) realistic goal setting to live a meaningful life post-injury. Hence, comparable to the holistic rehabilitation programmes, four of the core ACT principles (acceptance, self-as-context, valued goals, and committed action) are, thus, also encompassed within the MIM model. Furthermore, metaphors (easy to comprehend analogies) are utilised routinely in ACT (Eifert & Forsyth, 2005; Harris, 2009; Hayes, 2004). Until recently, metaphors were misconstrued as too difficult for persons who may be too concrete in their thinking. In contradiction, a number of studies have demonstrated that individuals with impaired working memory or slow processing, and even young children are capable of understanding and utilising metaphors (Lakoff & Johnson, 1999; Ylvisaker et al., 2008). Specifically, Ylvisaker et al. (2008) reported that in their work with adolescents and adults with TBI, metaphors were “effective in exploring otherwise difficult-to-comprehend abstract or challenging concepts” (p. 720).

To date, the MIM approach has only been applied in comprehensive multi-disciplinary rehabilitation programmes. There are no studies to our knowledge that have examined the effectiveness of MIM procedures in the context of a psychotherapy programme for distressed persons with an ABI (cf. Ylvisaker et al., 2008). To this end, given the compatibility of the MIM approach with ACT principles, an ACT-based intervention may be able to address this gap in the literature. Conversely, as a psychotherapy intervention, ACT, like MIM, has the potential to be included within a more comprehensive rehabilitation programme for individuals recovering from mild to moderate ABI, particularly in order to assist those individuals who are struggling with emotional and psychosocial problems. Specifically, both MIM and CBT (Mateer, Sira, & O'Connell, 2005) have been advocated as useful therapeutic approaches to assist clients negotiate personally meaningful goals in rehabilitation. ACT also has potential in this regard as it would enable distressed clients to re-learn and/or facilitate reliving a purposeful life in accordance with their values, whilst also learning and practising cognitive remedial skills.

FUTURE DIRECTIONS: CLINICAL AND RESEARCH IMPLICATIONS

The current review has indicated that the third wave of behavioural therapies, notably ACT and other mindfulness-based interventions, may be potentially useful in facilitating individuals to reclaim their lives following an ABI. In particular, acceptance-based strategies may be particularly suitable for ABI patient groups, given that to move forward with life, ABI patients must learn to accept their neurocognitive and physical limitations. Similarly, individuals who have sustained a mild or moderate ABI need to come to terms with living with some degree of uncertainty and the ACT focus on value-driven strategies may be especially useful in this context.

Over the past decade, the evidence base for ACT-based interventions in non-ABI populations has exponentially increased, which is also reflected in the number of meta-analytic reviews emerging in recent years (e.g., Pull, 2008; Ruiz, 2010) as well as the emergence of manualised and therapist workbooks (e.g., Forsyth & Eifert, 2008). However we cannot assume that the promising findings emerging from non-ABI medical populations will be equally efficacious with ABI patient groups. Therefore, future research needs to be directed towards testing the efficacy of ACT with distressed ABI patient groups. Whether or not ACT-type approaches are more accessible than traditional CBT for people with cognitive deficits, such as poor memory, slowed information processing and executive dysfunction, remains an empirical question. In the meantime, there are issues that

should be considered when deciding whether or not to implement an ACT-based therapy for people with ABI.

Based upon the literature, we recommend the following guidelines. First, we would recommend ACT for distressed individuals who are experiencing at least moderately elevated anxiety, stress or depression in response to their ABI experience. We would not however recommend ACT for any distressed person who reports suicidal ideation, as these individuals require more specialised psychiatric treatments. Secondly, until further empirical evidence is available for the suitability of ACT for ABI patient groups, we would recommend that ACT-based interventions are suitable for individuals recovering from mild to moderate ABI, and who have, at minimum, sufficient levels of cognitive, executive and language functioning, for example, who achieve scores on standardised measures of language, memory and executive function that are within 95% (1.65 *SD*) of the normative average.

When designing treatment programmes based on ACT principles we recommend that therapists follow a number of steps that are consistent with current practice of ACT as reported in the literature, as well as implementing modifications that would equally apply to any psychological treatment to be used with people with some cognitive impairments following ABI.

1. ACT therapy is most commonly, and effectively, administered one-to-one, face-to-face with a therapist.
2. Participants should be provided with an easy-to-read written hand-out at the end of each therapy session, which summarises the key components covered in each session.
3. When experiential exercises are first introduced in therapy (e.g., cognitive defusion strategies, mindfulness exercises) we recommend that an audiotape or CD which includes these exercises should be issued to the client so that they can practise these exercises between therapy sessions, in order to procedurally learn and consolidate these skills into their daily repertoire.
4. To enable clients to learn and practice skills between sessions, therapy should ideally occur on a weekly basis at least in the initial stages.
5. We also suggest that, based upon common practice in the literature, therapy programmes should run for 60–90 minutes duration for approximately 6–10 sessions. The specification of therapy duration needs to be contingent on the patient's specific therapy goals.
6. Initial sessions would usefully be modified to focus on educating, normalising and validating common reactions to being diagnosed and treated for an ABI.
7. Initial and following sessions should introduce individuals to the six core principles of ACT. In terms of introducing clients to re-evaluating and re-connecting with their valued life goals, patients should be guided

to reflect on their current strengths and weaknesses (including any ongoing medical/ABI side-effects) as well as reflecting on, (1) how the ABI experience may have hindered their ability to participate in valued activities they would like to re-engage in, and (2) how they would like to continue to live their life from here-on, whilst taking into account any physical and cognitive limitations that need to be considered in re-connecting to pursuing their life goals.

8. Final sessions may occur less frequently (e.g., on a fortnightly basis), to enable individuals to have extended personal practice to further consolidate the skills learned in their daily repertoire, and to have the opportunity to commit to purposeful living in accordance with their values.

Research guidelines

The methodological quality of empirical research is crucial in terms of establishing evidence-based clinical practice guidelines for interventions that are suitable for ABI populations (Perdices et al., 2006). In terms of future research aimed at testing the efficacy of ACT interventions with ABI populations, it is clear that controlled trials are needed. In the first instance, given there is a dearth of controlled trials that have tested ACT with ABI samples, a wait-list controlled (WLC) intervention design would be suitable. The WLC design is also ethically appropriate as all eligible participants would eventually receive the intervention. If the efficacy of ACT in enhancing the emotional well-being and quality of life of distressed ABI patient groups is demonstrated based on WLC designed interventions, then the next logical step for future research in this field would be to further test the efficacy of ACT interventions against alternative, suitably “active” treatments, including traditional CBT and pharmacotherapy. Indeed, conducting trials that directly compare ACT to traditional CBT programmes would have utility in also determining which persons with ABI benefit more from each specific type of intervention. Increasingly, there is recognition in the broader psychotherapy literature that “one therapy model” does not necessarily suit all types of individuals. To this end, given the heterogeneity in deficits sustained by different types of ABI populations (e.g., low to medium grade primary brain tumour compared with low to moderate TBI, versus mild dementia), multi-group controlled designed studies are also warranted in future research. This type of research would be able to determine whether a particular ACT-based intervention is uniformly efficacious across different types of ABI patient samples who have sustained low to moderate deficits.

In conducting research in this area, it is also important for the intervention programme to be manualised so as to systematically monitor therapists’

adherence to the therapy programme. The format and length of the treatment intervention also needs to be standardised. Selecting primary and secondary outcome measures, as well as delineating assessment end-points a priori, is also important. Selection of assessment measures should reflect the primary objectives of the study. For example, if the primary aim is to assess the efficacy of ACT for reducing emotional distress and improving quality of life, including community integration, there should be outcome measures for each of these variables.

Selection of appropriate secondary measures is also critical as these measures are instrumental in testing moderator and mediation effects of the intervention in order to determine which types of individuals with ABI do best with the given intervention. Indeed, there is a paucity of studies in the existent ABI-based literature that have extended research into testing the moderator and mediation effects of psychological treatments, although this is gaining momentum in the broader CBT and ACT literature. Finally, multiple assessment time frames are necessary to determine the immediate, short and longer-term (3 or more months) effects of the intervention. Longer-term follow-up assessment is necessary to test retention effects, especially if the intervention is proven to be beneficial for patients in the short-term. If the longer-term effects wane, this information is also instrumental for the future revisions of the treatment protocol. For example, increasing the duration of treatment, and/or inclusion of several intermittent booster sessions may be warranted to enable ABI patients to further consolidate skills learned as well as reduce the risk of relapse.

CONCLUSION

Overall, there is a paucity of RCT intervention studies for the treatment of psychological problems (e.g., Soo & Tate, 2007) and adjustment-related disturbances in ABI populations. When evaluating the efficacy of psychosocial interventions to improve functionality and overall quality of life after an ABI, it is crucial that the therapeutic interventions have a valid conceptual basis. The recent emergence of the evidence base for ACT interventions across a variety of psychological and medical populations (Hayes et al., 2006; Pull, 2008) accentuates that *this is the opportune time* for clinicians and researchers working with ABI populations to begin to conduct rigorous RCT interventions in testing the efficacy of ACT interventions in enhancing the well-being and quality of life of persons who have sustained these life-altering conditions. Given that ACT interventions are oriented towards improving functionality, this type of intervention should be evaluated in a range of contexts and, particularly, in the context of multimodal rehabilitation programmes for ABI patient groups. The evolution of behavioural-based

interventions provides clinicians and researchers with more options for testing appropriate conceptually based therapeutic models in helping ABI patients resume their lives post-diagnosis and/or injury, by facilitating reliving a purposeful life, consistent with their values. We therefore owe it to our patients to test whether the ACT paradigm has utility in achieving this goal.

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