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## **ABSTRACT**

Background: Adults with long term neurological conditions can face complex challenges including anxiety and depression. Emerging research suggests the utility of third wave approaches (the third development of psychotherapies) in working transdiagnostically with these difficulties. Aims: This systematic review sought to summarise and appraise the quality of published empirical studies using third wave therapies such as: Compassion Focused Therapy (CFT); Acceptance and Commitment Therapy (ACT); and Mindfulness-Based Cognitive Therapy (MBCT) or Mindfulness-Based Stress Reduction (MBSR). Method: Review procedures followed PRISMA guidelines, with 437 abstracts screened, 24 full-text articles retrieved and 19 studies found to meet inclusion criteria. Six out of seven randomised studies had unclear or high risk of bias, whilst the majority of non-randomised studies were considered moderate quality. Results: Overall, studies reported a statistically significant reduction in emotional distress. Of the 13 studies that used model-specific process measures, 10 found statistically significant improvements in transdiagnostic factors. Discussion: The findings indicate that third wave therapies show promise in addressing transdiagnostic difficulties within neurological conditions. A number of methodological and conceptual issues for the included studies were highlighted during the quality appraisal process. Clinical implications include consideration of intervention length and use of outcome measures. Research implications are discussed by considering the progressive stages of development for behavioural treatments.

*Key words;* third wave therapies; Acceptance and Commitment Therapy; Mindfulness; transdiagnostic; neurological condition; systematic review

## **INTRODUCTION**

According to the National Service Framework (NSF) in the United Kingdom (Department of Health (DoH), 2005), a long term neurological condition results from disease, injury or damage to the body's nervous system (the brain, spinal cord and/or their peripheral nerve connections), which will significantly impact on the individual and their family for the rest of their life. This includes progressive conditions such as Multiple Sclerosis (MS), Parkinson's Disease and Motor Neurone Disease (MND); sudden onset conditions such as spinal cord injury, Acquired Brain Injury (ABIs) including stroke and Traumatic Brain Injury (TBIs); and intermittent conditions such as epilepsy (DoH, 2005). While stroke is covered by the NSF for older people (DoH, 2001), for the purposes of this review it is included here as a long term neurological condition.

It is estimated that ten million people are affected by long term neurological conditions in the UK (DoH, 2005). Such individuals often face complex challenges in daily living, including physical, emotional, psychological and social difficulties. Higher levels of anxiety and depression as compared to people in good physical health have been reported, with estimates of both being approximately two to three times more common in long term neurological conditions (Bombardier et al., 2010; Hackett, Yapa, Parag & Anderson, 2005; Kangas, Tate, Williams & Smee, 2012; Reijnders, Ehrt, Weber, Aarsland & Leentjens, 2008; Whelan-Goodman, Ponsford & Schönberger, 2009). Individuals are reportedly also more likely to experience significant difficulties with adjustment, self-image, and identity (Ellis-Hill & Horn, 2000; Gracey, Evans & Malley, 2009; Gracey & Ownsworth, 2008; Roger et al., 2014). In their service delivery guidance, the NSF advocates psychological support to enable individuals to achieve a sense of wellbeing and adjust to altered personal, family and social circumstances. Equally, a biopsychosocial approach is advocated for within the International

Classification of Functioning, Disability and Health (ICF, World Health Organisation 2001). This guidance highlights that adjustment to changes in functioning and lifestyle as being influenced by a range of personal and environmental factors and suggests a role for psychological approaches.

### **Psychological therapy for neurological conditions**

The psychological difficulties associated with long term neurological conditions have conventionally been addressed by transferring evidence-based therapies from mainstream practice, with Cognitive Behavioural Therapy (CBT) being most evidence-based (Ferne, Kollman, & Brown, 2015). Systematic reviews exist that demonstrate the efficacy of CBT for depression in specific neurological conditions such as MS (Hind et al., 2014), epilepsy (Fiest et al., 2013); and TBI (Fann, Hart & Schomer, 2009; Gertler, Tate & Cameron, 2015); CBT for anxiety in TBI (Soo & Tate, 2007); and CBT for depression and anxiety in ABI (Waldron, Casserly & O'Sullivan, 2013). On one hand, there is evidence to suggest better outcomes and effect sizes are obtained for disorder specific CBT approaches in ABI (Waldron et al., 2013), although there was a lack of available intervention studies using a transdiagnostic approach at the time to be included in their review.

On the other hand, the heterogeneity of neurological diagnoses means clinicians and researchers can be working with individuals whose emotional needs do not meet specific diagnostic criteria and present as co-morbidities (Gracey et al., 2015). Emotional distress in particular can present as a range of emotional and neurobehavioural reactions (Shields, Ownsworth, O'Donovan & Fleming, 2016). Such difficulties could benefit from a transdiagnostic rather than disorder-specific approach (Gracey et al., 2015). Until the systematic review by Fernie and colleagues (2015), no prior reviews were found that assessed

CBT in neurological conditions as a category. This is relevant, as many neurological conditions share impairment characteristics such as executive dysfunction and limited mobility (Ferne et al., 2015), as well as psychological factors such as changes in self-concept (Roger, Wetzel, Hutchinson, Packer, & Versnel, 2014). Therefore, assessing interventions for neurological conditions as a category may help the results of a review become more generalisable and useful in its clinical and research implications (Ferne et al., 2015).

### **Transdiagnostic processes**

While there are clear differences and variations between long term neurological conditions, such as their aetiology, epidemiology and prognosis, there are also similarities in terms of common psychological processes across diagnoses. In setting out to consider transdiagnostic processes and treatment approaches, it seems important to highlight the conceptual confusion within the literature that has led to the terms transdiagnostic process and approach often being used interchangeably. For the purpose of this review, a transdiagnostic process refers to the psychological processes that can occur across a range of disorders, such as rumination. It has been defined as “*an aspect of cognition or behaviour that may contribute to the maintenance of a psychological disorder*” (Harvey, Watkins, Mansell, & Shafran, 2004, p. 14). Meanwhile, a transdiagnostic approach refers to a treatment approach that focuses on what disorders have in common. For example, a mindfulness-based therapy can be used with a range of disorders. By using a transdiagnostic approach, clinicians can target the functional underpinnings of multiple psychological problems rather than being driven by a disorder-specific approach.

An up-to-date review by Salkovskis et al. (2016) has discussed the utility of a CBT-grounded transdiagnostic approach to working therapeutically with long term conditions generally. The

paper highlights transdiagnostic factors important to consider including: mood changes, attentional processes, emotional avoidance/suppression, safety-seeking behaviours, all-or-nothing (“boom or bust”) behaviour, generalised withdrawal, rumination, autonomic arousal, sleep disturbances, and the potential for deconditioning in some diagnoses. Meanwhile, Shields et al. (2016) have recently completed a transdiagnostic investigation of emotional distress after TBI. They synthesised findings from across studies and identified a number of transdiagnostic processes, such as repetitive negative thinking including rumination and worry, avoidance behaviours, threat appraisals, negative self-concept and self-discrepancy, difficulties with emotion regulation and negative self-focussed attention. These transdiagnostic processes are by no means unique to TBI. For example, there is research to suggest the relevance of self-concept and self-discrepancy in stroke and ABI (Ellis-Hill & Horn, 2000; Ownsworth & Gracey, 2010; Shields & Ownsworth, 2013) and neurological conditions generally (Roger et al., 2014); and threat appraisals in progressive disorders such as MS (Dennison, Moss-Morris, & Chalder, 2009). Furthermore, Versnel and colleagues (2013) discuss the commonality of “illness experience” across neurological conditions, and assert that these experiences are not diagnostic-specific. The authors therefore set out to examine the transdiagnostic impact of neurological conditions on everyday life. From the similarities of the current literature, it seems important to consider transdiagnostic processes, and thus transdiagnostic treatment approaches, across long term neurological conditions.

### **Third wave therapies**

There have been several developments within therapies that have promoted a shift away from altering psychological events such as thoughts, beliefs and cognitive schemas, towards therapies that aim to change the individual’s relationship to their psychological experiences (Hayes, 2004). These “third wave therapies” are so-called because they form the third

development of psychotherapy and represent an extension of CBT (Hayes, 2004). Third wave therapies including Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999), Compassion Focused Therapy or Compassionate Mind Training (CFT/CMT; Gilbert, 2009) and Mindfulness-Based Stress Reduction or Mindfulness Based Cognitive Therapy (MBSR/MBCT; Kabat-Zinn, 1990), amongst others (Dialectical Behavioural Therapy: Linehan, 1993; Metacognitive Therapy: Wells, 2000). These therapies are considered transdiagnostic approaches as they transcend diagnostic categories, as outlined by Craske (2012). Transdiagnostic processes such as difficulties with emotion regulation are key skills addressed using therapies such as ACT, DBT and CFT, which aim to reduce unhelpful and avoidant coping and encourage use of adaptive emotion regulation skills such as reappraisal, self-soothing and mindfulness (Shields et al., 2016).

#### *Acceptance-based approaches*

ACT is theoretically rooted in Relational Frame Theory (Hayes, Barnes-Holmes, & Roche, 2001), a contextual behavioural approach to human language and cognition. Psychological flexibility is the applied model that underlies an ACT approach and refers to the ability to more fully contact the present moment, and the thoughts and feelings it contains, to change or persist with behaviours that serve personal values (Hayes, Villatte, Levin, & Hildebrandt, 2011). The approach is organised around six processes: defusion, acceptance, present moment focus, self-as-context, values, and committed action. The principles of ACT are taught to clients by means of experiential exercises, mindfulness methods, and a specific use of language (e.g. metaphors and paradoxes).

The application of ACT has been explored in neurological populations in several recent papers. Firstly, the role of pain acceptance in adjustment to chronic pain secondary to

neurological disorders has been reviewed (Kratz, Hirsh, Ehde, & Jensen, 2013), with chronic pain associated with MS in particular being targeted (Tooze, Karl, Dysch, & McLaughlin, 2014; Carrigan & Dysch, 2015). Acceptance approaches have also been evaluated in the positive adjustment to changed life circumstances as a result of conditions including MS (Pakenham & Fleming, 2011), ABIs (Sylvester, 2012) and in chronic health conditions more generally. While it has been found that an ACT approach can be helpful in managing anxiety generally, it is yet to be specifically reviewed for managing anxiety in ABIs (Soo, Tate, & Lane-Brown, 2011). Within the TBI literature, a recent conceptual review has indicated that therapies which promote psychological flexibility (such as ACT) are beneficial to people with TBI who have damage to areas controlling executive functioning (Whiting, Deane, Simpson, McLeod & Ciarrochi, 2017).

#### *Compassion-based approaches*

Gilbert's (2009) model of CFT uses theory from social, developmental, evolutionary and Buddhist psychology, and neuroscience to apply a compassion model to psychotherapy. Drawing on this model, CMT refers to specific activities designed to develop compassionate attributes and skills, principally those that influence affect regulation (Gilbert, 2009). It was developed for clients who experience high levels of shame and self-criticism, to teach them how to self-soothe (Gilbert & Proctor, 2006). Ashworth, Gracey, and Gilbert (2011) have illustrated the feasibility of CFT in working with the shame experienced by an individual following ABI and found significant reductions in anxiety and depression and significant increases in kindness and self-warmth. It must be noted that the research by Ashworth et al. (2011) was conducted within the context of a highly intensive and comprehensive rehabilitation programme and this would likely have some implications in terms of generalisability.



### *Mindfulness-based approaches*

Jon Kabat-Zinn (1994) defines Mindfulness as: “*paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally*” (p.4). Mindfulness practices originate from ancient Buddhist meditation techniques but have been adapted for clinical settings. The best researched of these approaches is MBSR. MBSR was developed by Jon Kabat-Zinn in 1979 for people with chronic pain and terminal health conditions that were initially difficult to treat in a hospital setting. MBSR consists of breath awareness, body awareness and mindful movement, taught in a group over eight weeks. MBCT is a derivative that places greater emphasis on cognitive techniques and was designed with recurrent depression in mind. There is also growing evidence of the use of mindfulness-based interventions in neurological populations to: enhance wellbeing and quality of life in individuals with MS (Senders, Bourdette, Hanes, Yadav, & Shinto, 2014) and brain injury (Azulay, Smart, Mott & Cicerone, 2013; Bédard et al., 2003; 2005); reduce depressive (Grossman et al., 2010) and anxiety symptoms (Hankin, 2010) in MS; improve fatigue in stroke (Johnanssen, Bjuhr, & Rönnbäck., 2012) and ABI (Johanssen Bjuhr, & Rönnbäck, 2013); improve symptom management in MS (Mills & Allen, 2000); and to address cognitive deficits (McHugh & Wood, 2013).

### **Why is it important to undertake a review?**

The number of papers being published that evaluate the use of third wave therapies is increasing each year. A pilot literature search of third wave therapies and neurological conditions in August 2014 found 18 papers, with the earliest publication date being 2003. Twelve of the 18 papers have been published since 2011. To the author’s knowledge, the literature reviews undertaken to date have related to specific third wave therapies for specific

neurological conditions, such as ACT for ABI (Kangas & McDonald, 2011), ACT for anxiety in ABI (Soo, et al., 2011), and mindfulness-based approaches for MS (Simpson et al., 2014) or stroke (Lawrence, Booth, Mercer, & Crawford, 2013). The range of difficulties associated with long term neurological conditions suggests there is a need to review and develop an understanding of therapies that can target the functional underpinnings of multiple psychological problems. It may be advantageous for clinicians to develop a better understanding of working transdiagnostically with these features of long term neurological conditions using third wave therapies. An overall review of third wave therapies for neurological conditions thus seems timely.

This review has two aims, to: (i) summarise and evaluate current treatment studies using third wave therapy approaches for long term neurological conditions; and (ii) consider the nature of the study, the quality of the evidence, the proposed transdiagnostic processes or factors targeted for intervention, the outcomes being measured, and treatment outcomes.

## **METHOD**

The methodology and results followed PRISMA guidelines for reporting systematic reviews (Moher et al., 2010), using items 1-3, 6-12, 17-20 and 24-26 and a study flow diagram (Figure 1). Given the diversity of study types, a systematic review with qualitative synthesis of results was completed. PRISMA items not included were outside of the scope of the current review.

Insert Figure 1 here

### **Search strategy**

PsycInfo, PubMed and Embase were searched using the following keyword terms. Within PsycInfo, PsycExtra and PsycTests were not searched. Table 1 summarises the search strategy. The search terms were checked to work in all three databases. No date restrictions were applied. The closing date of the search was December 2016.

Insert Table 1 here.

### **Study selection**

The database searches and study selection were undertaken by the lead author. Papers were broad screened by scanning the titles and abstracts, with reference to the eligibility criteria. When there was an indication of eligibility, the entire paper was retrieved for a full text review. A record was kept of the papers excluded. Due to the expected low yield of papers, a decision was made not to exclude research solely on the basis of poor methodological quality but to indicate the quality using a quality appraisal tool. The references of all selected studies were hand-searched for additional published reports and citations of unpublished studies and relevant review papers were also checked. Studies were included if they were believed to have met the following study characteristics (Population, Intervention, Comparatives, Outcomes, Timing and Setting).

#### *Populations*

Studies where participants were aged 18 years or older with a long-term neurological condition were included. For the purposes of the review, this included: progressive conditions such as MS, Parkinson's disease and MND; intermittent disorders such as epilepsy; and sudden-onset conditions, such as TBI, ABI including stroke, and spinal cord injury.

### *Interventions*

The third wave therapy approaches included were ACT, CFT/CMT, and MBSR/MBCT. These approaches were considered pertinent to working therapeutically with common psychological factors associated with long term neurological conditions. The psychological intervention was required to be delivered through face-to-face meetings between client and therapist. Psychological therapy approaches conducted on an individual or group basis were included. The number of sessions was not limited, and we accepted psychological therapy interventions delivered in a single session.

### *Comparators*

A comparison group was not required for inclusion, and study selection was not limited by Time or Setting.

### *Outcomes*

Studies with pre- and post-intervention measures were included. No stipulations were made about types of outcome due to the nature of possible outcomes, to maximise the scope of the work. Particular attention will be made to measures of mood and psychological distress, and model-specific outcome measures to assess the core elements of a specific theoretical orientation. In the case of third wave therapies, this may be a measure of a transdiagnostic factor specific to the therapy being offered e.g. the process of acceptance in ACT.

In addition, primary research such as case studies, case-series, quasi-experimental studies or randomised clinical trials (RCTs) were included. No exclusions were placed on study type, considering the emerging evidence base and the propensity for small-N designs. Non-English

language publications were excluded. Studies which focused solely on older adults were also excluded, due to the co-morbidity of ageing factors and focus on dementia-like symptoms.

### **Data Extraction**

Included papers were exported into Endnote Web. A data extraction form, adapted from National Institute for Clinical Excellence (NICE) guidelines (2012), was used to summarise data, including: 1) study methods and setting; 2) population demographics, clinical and diagnostic details; 3) type, modality, frequency, duration of treatment and the transdiagnostic process or factors being targeted; 4) outcome measures; 5) and treatment outcomes.

### **Quality assessment and risk of bias**

Three assessment tools have been used and the decision-making process for quality assessment was documented. In randomised studies, this was assessed using the Cochrane Collaboration's tool for assessing risk of bias (Higgins et al., 2011). This tool provides a structure to evaluate the risk of bias across seven key domains, including: how a study selects participants; measures performance; blinds participants and investigators; explores attrition, and reports findings. Each domain for each study was allocated a ranking of "Low" (plausible bias unlikely to seriously alter the results), "Unclear" (plausible bias that raises some doubt about the results) or "High" risk of bias (plausible bias that seriously weakens confidence in the results). Global ratings were given through considering risk of bias across domains, with overall ratings of Low (low risk of bias for all key domains), Unclear (unclear risk of bias for one or more key domains), or High (high risk of bias for one or more key domains).

The Newcastle-Ottawa Quality Assessment Scale (NOS; Wells et al., 1999) was used to appraise the quality of case-series, with and without control groups. This tool is endorsed by

the Cochrane Collaboration (Higgins et al., 2011). The scale identifies high quality choices with a star across three domains; a maximum of one star can be awarded for each of the four items in “selection”, each of the three items in “exposure/outcome” categories and a maximum of two stars for “comparability”. While the NOS manual does not provide overall quality descriptors based on the total number of stars, overall ratings will be determined for the studies, to allow for the consideration of outcomes. For the modified cohort scale (case series, no control group), one to two stars were considered Low quality, three to five stars as Moderate, and six to seven stars as High quality. For the modified case-control scale (case series, with control group), one to three stars were considered Low quality, four to six stars as Moderate, and seven to nine stars as High quality.

For the single participant studies, the Single Case Experimental Design (SCED) scale was used (Tate et al., 2008). This is an 11-item rating scale of which 10 items are used to assess the methodological quality and use of statistical analysis in case studies. It has been found to have excellent inter-rater reliability for individual raters for the total score reported (overall intraclass correlation = 0.84; 95% confidence interval 0.78-0.95) (Tate et al., 2008). Quality descriptors were allocated for ratings to aid in the overall appraisal of quality, with scores of three or less considered Low quality, scores of four to six considered Moderate, and scores of seven to ten considered High quality.

In addition, the third wave therapies will be overall appraised in relation to the current stage of the evidence base, using the Stage Model of Behavioural Therapies research (Rounsaville, Carroll, & Onken, 2001). This model articulates the progressive stages of the development and evaluation of behavioural treatments, from initial clinical innovation through efficacy research to effectiveness research (Rounsaville et al., 2001). Stage I consists of

pilot/feasibility testing, manual writing, training, and measure development for new treatments. Stage II moves to RCTs to evaluate manualised and pilot-tested treatments, which have shown efficacy in earlier studies. Stage III consists of studies to evaluate transportability of treatments for which efficacy has been shown in at least two RCTs, with a focus on generalisability, implementation, and cost-effectiveness. Given the expected diversity of included study types for evolving interventions, this model can provide a useful basis for considering quality and risk of bias relative to the stage of treatment manual development and evaluation.

## **RESULTS**

A range of study designs were employed, including RCTs (n = 7), a between-group repeated measures design (n = 1), case-series (n = 6) and single case-studies (n = 5). Studies were carried out across a number of countries, with just less than half (n = 9) of the reported studies undertaken in the UK. For the non-UK studies (n = 10), one was conducted in South Africa, one in India, two in Sweden, one in the US, two in Canada, one in Switzerland, one in Korea, and one in Belgium. Table 2 gives detailed study characteristics.

Of the 486 participants included in the review, 167 (34.4%) were male and 319 (65.6%) were female. The age of participants across studies ranged from 18 to 75 years. Mean ages of participants were similar across all studies. There were limited data overall regarding ethnicity, education and socio-economic status. Studies included a range of different clinical diagnoses and therapeutic modalities. Table 3 offers a summary of this.

Insert Table 2 here.

Insert Table 3 here.

Interventions were offered in a range of formats, including individual sessions only (n=8), group-based sessions only (n=7), individual and sessions joint with a family member (n=1) or a mixture of individual and group sessions (n=3). The number of sessions attended by participants varied hugely across the studies, from one session or workshop (O'Neill & McMillan, 2012; Sheppard et al., 2010) to 24 sessions (Ashworth et al., 2011). Sessions were primarily offered on a weekly basis. Duration ranged from 30 minutes (O'Neill & McMillan, 2012) to a full-day workshop (Ashworth et al., 2011). Of those studies that reported session duration, individual sessions (sole or in conjunction with groups) on average lasted an hour (n=12, M=1.2, SD=0.6); while group-based sessions (sole or in conjunction with individual work) were typically reported as longer (n= 8, M=3.75 hours, SD= 2.0).

Across all studies, the rates of attrition ranged from 0% (Lundren et al., 2008) to 60% (Joo et al., 2010), excluding n=1 case studies. Overall, participant withdrawal was lower and better accounted for with the seven RCTs, with a mean attrition rate of 10.6% (SD=11.2). Reasons cited included moving, other commitments, scheduling issues, loss of interest, or disease-related problems.

### **Quality assessment and risk of bias**

The quality of the included studies was appraised independently for non-randomised research (including case-studies), and randomised research. They are discussed separately below.

#### *Quality assessment for randomised designs*



The seven RCTs employed methods to reduce the potential for bias including random sequence allocation to intervention or control conditions, intention-to-treat analysis methods and blinding of assessors in analysing outcome measures. One RCT was assessed as Low risk of bias (Grossman et al., 2010), four as an Unclear risk (Bédard et al., 2015; Johansson et al., 2012; Lundgren et al., 2008; Nordin & Rorsman, 2012) and two as at High (Lundgren et al., 2006; Pickut et al., 2015). Some of the common criteria linked to an Unclear risk included a lack of information about allocation concealment and blinding of outcome assessors, while incomplete outcome data was linked to High risk of bias. All studies showed Low risk of bias in relation to selective reporting, meaning all pre-specified outcomes were reported.

#### *Quality assessment for non-randomised designs*

The potential for bias is known to be inherent to case studies, case series, and quasi-experimental study studies due to sampling, selection and measurement biases. Applying the assigned quality descriptors for single-participant studies, three case studies were rated as Low quality (Ashworth, 2014; Ashworth et al., 2011; Gillanders et al., 2015) and two-case studies were rated as Moderate quality (Gillanders & Gillanders, 2014; Shields & Ownsworth, 2013). All included studies specified measures of target behaviours and reported raw data points, with the majority using statistical analysis. Methodological aspects not so well addressed included the use of A-B designs with pre- and post-evaluation measures only in four out of five studies (Ashworth, 2014; Ashworth et al., 2011; Gillanders & Gillanders, 2014; Gillanders et al., 2015), and only one study (Shields & Ownsworth, 2013) employing the use of follow-up measures. None of the included case studies used multiple data points for baseline measures. In addition, there was an absence of discussion about inter-rater reliability for measures of target behaviours or independence of assessors.

Meanwhile, the case series and experimental study ranged in quality from 4 to 6 stars out of a maximum of 7 stars, using the modified NOS cohort scale (selection and outcome/exposure categories only); and 4 to 7 stars out of a maximum 9 for the modified case-control NOS scale (selection, comparability and outcome/exposure categories). Applying the quality descriptors to these star ratings, no studies were rated as Low quality; five studies were rated as Moderate quality (Bédard et al., 2003; Dewhurst et al., 2015; Joo et al., 2010; Kangas et al., 2015; Sheppard et al., 2010); and two studies were rated as High quality (Ashworth et al., 2015; O'Neill & McMillan, 2012).

### *Appraisal of third wave therapies*

The variable nature and quality of the third wave therapies may be better understood in terms of a Stage Model of Behavioural Therapies research (Rounsaville et al., 2001). According to this model, the reviewed research involving CFT is just within stage Ib of the model, with small-scale and non-randomised research. Taking the high-quality study by Ashworth and colleagues (2015), the feasibility of using CFT in brain injury has been demonstrated, with clinically significant patient improvements in mood and self-criticism over time and the consideration of effect sizes. What is currently lacking and needed for progression within the CFT literature is the use of a control group, larger sample sizes and randomisation to group. The reviewed ACT studies included more than two RCTs (Lundgren et al., 2006; 2008; Nordin & Rorsman, 2012), which meets criteria for stage III of the model. Likewise, the research utilising MBCT and MBSR has met the criteria for stage III (Bédard et al., 2015; Grossman et al., 2010; Johansson et al., 2012; Pickut et al., 2015). However, in both the ACT and MBCT/MBSR RCTs there were a majority of studies that had an unclear risk of bias. The Low risk of bias study by Grossman et al., (2010) addresses the previously covered issues with risk of bias and is a good example of a well-designed RCT.

## Outcomes

The effectiveness of third wave therapies was considered from treatment outcomes for mental health symptoms such as anxiety, depression and emotional distress; and model specific process outcomes, such as changes in acceptance, compassion and mindfulness. Table 2 shows the range of self-report outcome measures administered. Within the third-wave therapy literature, the value of specific measures to assess transdiagnostic processes of change has begun to be recognised. The measures included in this review tap into transdiagnostic processes such as self-compassion, self-criticism, acceptance, psychological flexibility, thought defusion, values attainment and mindful awareness.

*Outcomes for randomised designs* The randomised research tended to report statistical significance in terms of changes to group means from pre- to post-treatment, clinically significant change and effect sizes. A decrease in mental health symptoms such as anxiety, depression and emotional distress, were reported in three of the RCTs (Bédard et al., 2015; Grossman et al., 2010; Johansson et al., 2012). Changes on the Beck Depression Index (BDI) did not reach significance for Pickut et al. (2015) and this study was classed as poor quality. While Nordin and Rorsman (2012) observed a reduction in anxiety and depressive symptoms, this reduction was not as great for the group that received the ACT intervention compared to the Relaxation Training control group. Lundgren et al. (2006; 2008) did not report on anxiety and depression symptoms within their two studies.

For the model-specific outcomes, there were reported statistically significant improvements in three of the RCTs relating to acceptance and psychological flexibility (Lundgren et al., 2006; Nordin & Rorsman, 2012) and mindful awareness (Pickut et al., 2015). Bédard et al.

(2015) found an increase in mindful awareness compared to controls but this did not meet statistical significance. They discuss the difficulties in capturing facets of mindfulness and the potential limitations of the scales measuring stable traits rather than states. Three out of seven of the RCTs did not use model-specific process measures (Grossman et al., 2010; Johansson et al., 2012; Lundgren et al., 2008), with two of these studies relating to mindfulness-based interventions.

*Outcomes for non-randomised designs* Non-randomised studies tended to report statistical significance in terms of changes to group means from pre- to post-treatment; others considered clinically significant change and reliable change using a Reliable Change Index (RCI); and some offered effect sizes. A decrease in mental health symptoms such as anxiety, depression and emotional distress, were reported in 11 out of 12 of the non-randomised studies as statistically significant, while O'Neill and McMillan (2012) did not report intervention effects on distress.

For the model-specific outcomes, there were reported statistically significant improvements in self-compassion and self-criticism (Ashworth, 2014; Ashworth et al., 2015); mindful awareness (Sheppard et al., 2010); thought suppression (Sheppard et al., 2010); and acceptance and psychological flexibility (Gillanders & Gillanders, 2014; Graham et al., 2015; Kangas et al., 2015). While Shields and Ownsworth (2013) found an increase in self-compassion from low to moderate, this did not meet threshold for reliable change. Likewise, O'Neill and McMillan (2012) reported no significant treatment effect on self-compassion compared to relaxation controls. Both these studies hypothesise this is likely due to the shortness of the intervention (10 sessions and a 30-minute compassionate image induction

respectively). Three studies did not use model-specific process measures (Ashworth et al., 2011; Dewhurst et al., 2015; Joo et al., 2010).

## **DISCUSSION**

### **Overview**

The findings of the review indicate that using transdiagnostic third wave therapies shows some initial promise in addressing the emotional difficulties associated with long-term neurological conditions. A number of methodological and conceptual issues for the included studies were highlighted during the quality appraisal process and thought is given to how to progress third wave therapies through the Stage Model of Behavioural Therapies (Rounsaville et al., 2001).

Considering included studies as a whole, 14 out of 16 studies demonstrated a statistically significant reduction in emotional distress, anxiety or depression. Of the 13 studies that used model-specific process measures, 10 found statistically significant improvements in transdiagnostic processes. Across all studies, there was considerable variability in methodological quality and statistical analysis. Specifically focusing on the High quality/Low risk of bias studies, clinically significant improvements were found for anxiety and depression (Ashworth et al., 2015; Grossman et al., 2010) and transdiagnostic factors such as self-criticism/self-compassion (Ashworth et al., 2015), with moderate to large effect sizes in these studies. The evidence for other transdiagnostic factors such as acceptance and mindfulness was not as strong, with studies appraised as either Unclear risk of bias or Moderate quality. Often, this was owing to a lack of information.

Overall, the findings of this review are consistent with those of recent systematic reviews and meta-analyses of third wave therapies more broadly, which comment on the methodological problems and risk of bias of the research (Hunot et al., 2013, Kahl, Winter, & Schweiger, 2012; Ost, 2008; Ost, 2014). For example, ACT has been the focus of most of the criticisms to third wave therapies, particularly its scarce empirical evidence and relatively small number of participants (Ruiz, 2012). There has been a strong increase in the number of published RCTs in recent years, and a number of meta-analysis have been produced (Ruiz, 2012; Ost, 2014). Given the literature is in the early stages of development, perhaps it is better to think about what third wave therapies such as ACT can offer to complement and go beyond what is already offered by CBT. A particular strength is the emphasis on changing an individual's relationship to events, thoughts or behaviours. In the case of ACT, the therapeutic target is to help patients experience difficult thoughts without struggling to change their content, and in parallel, to engage in behaviour consistent with their values. Positively, Ruiz (2012) found that ACT seemed to work through its proposed processes of change, such as increased cognitive defusion and decreased experiential avoidance. This would suggest that using model-specific process measures is of value over-and-above symptom-only measures. The present review highlights that further consideration of processes of change are needed in empirical research, and to some degree this consideration is linked to the language used by studies and issues of conceptualisation.

The authors of this review noted a discrepancy in the terms used within included studies and the wider literature, with the term 'transdiagnostic process' frequently not defined by studies and used interchangeably with other terms relating to transdiagnostic approaches. As discussed in the Introduction, this confusion can have implications for the processes a clinician or researcher is hoping to measure and change. Given that transdiagnostic

approaches are considered a paradigm shift and are still within their infancy, perhaps this suggests the literature needs further time to develop. This would enable the approaches to be tailored to working therapeutically with the emotional and neurobehavioral processes common to long term neurological conditions.

### **Limitations**

Several limitations to this review should be noted. Firstly, while the published literature was searched systematically in several databases, trial registers were not searched for unpublished studies. This may unintentionally contribute to the “file drawer effect”. In addition, the grey literature was not searched. As Hunot et al. (2012) point out, there is a potential for some of the studies conducted most recently to have been excluded by these decisions. Secondly, non-English language papers were excluded due to resource constraints. Despite this, papers from varied geographical locations were included, which goes some way to bolster the generalisability of the review conclusions. Thirdly, treatment fidelity was not assessed. In future versions of the review, it would be useful to extract information relating to adherence to the approaches such as independent ratings of randomly selected audio-visual recordings.

Of note, there is some criticism in the literature towards the use of the Newcastle-Ottawa Scale. Stang (2010) comments that the growing use of the NOS as an apparently established “easy to use” quality score may be problematic, due to some items having uncertain validity. For example, the NOS gives the same score to studies that did independent or blind outcomes as those that utilised record linkage (outcome identification through database records). Stang (2010) highlights that this can lead to arbitrary results and far-reaching conclusions being drawn. In addition, low inter-rater reliability of the NOS between reviewers and authors has been suggested (Lo, Mertz, & Loeb, 2014). One possible explanation for the discrepancy is

that reviewers may not have all the information needed from the published article (Lo et al., 2014). In this review, we did not contact study authors for additional information and therefore the NOS quality assessment of studies will be subject to the above limitations.

### **Clinical implications**

Clinicians may want to consider using transdiagnostic approaches to address distress, as such approaches encourage patients to develop adaptive emotion regulation and mindful awareness skills (Shields et al., 2016). Using an approach such as ACT may be helpful in enabling adjustment to changed life circumstances (Dewhurst et al., 2013; Gillanders & Gillanders, 2014) and CFT may be indicated when self-criticism is identified due to a discrepancy in self-concept (“old me, new me”) (Shields and Ownsworth, 2013). On one hand, there is promising evidence that favours a transdiagnostic approach to working with neurological conditions (Shields et al., 2016); while on the other hand studies exist that advocate disorder specific approaches (Waldron et al., 2013). Perhaps trying to reconcile these differences gives continued impetus for clinicians to be formulation-driven and to therapeutically consider both shared/transdiagnostic factors and unique factors related to specific neurological disorders, in planning and giving the most effective interventions.

The length of an intervention may be a key consideration for clinicians. While approaches such as MBCT/MBSR are highly manualised and specify the number of sessions, other approaches such as CFT and ACT do not. This review has highlighted two CFT studies where the authors felt the interventions were too short in duration. A good example of session number and content can be accessed in the paper by Ashworth (2014), who gives a transparent and detailed account of the CFT intervention undertaken for the case study.



It is important that clinicians are also mindful of the questionnaires they use to measure treatment outcomes and processes of change. Not all the study questionnaires in this review have been validated for neurological populations and clinicians may need to carefully consider the validity of questionnaires they use. Self-report questionnaires about mood typically include items about being “slowed down” as well as changes in eating and sleeping. Such items are confounded by also measuring changes in functioning. The process measures for transdiagnostic factors are less likely to have the same construct validity issues, due to the different emphasis of items. For example, the Forms of Self-Criticism/Self-Attacking and Self-Reassuring Scale (Gilbert, Clark, Hempel, Miles, & Irons, 2004), or the Acceptance and Action Questionnaire-II (Bond et al., 2011). However, the language of the questionnaires may be too complicated for some clients who experience cognitive difficulties. Of note, Whiting, Deane, Ciarrochi, McLeod and Simpson (2015) have recently adapted and validated the AAQ-II for an ABI population (AAQ-ABI), with the questions featuring simplified language and a shorter 5-point rather than 7-point Likert scale. Further adaptations and validation studies may be required for other neurological populations.

### **Research implications**

There are several implications for research in terms of strengthening the methodological quality and the use of validated model-specific outcome measures. In addition, recommendations are made for assessment of fidelity to treatment and the operationalisation of relevant terms in future studies. To progress the CFT literature, there is a need for larger sample sizes and the inclusion of a control group with randomised allocation, in order to consolidate a move from stage Ib to stage II of the Stage Model of Behavioural Therapies research (Rounsaville et al., 2001). Equally, more methodologically robust and rigorous trials are needed within the ACT and MBCT/MBSR literature, to address some of the known risks

of bias, and to aid generalisability, implementation and cost-effectiveness issues of stage III. Secondly, it is important that there is increased research into the reliability and validity of model-specific outcome measures with different neurological populations, through determining normative thresholds for commonly used measures. While fidelity to treatment was not assessed in this review, it was noted that not all studies discussed therapist adherence to the model for treatment. A future consideration should be on therapist adherence and competence measures. Future studies would also benefit from defining and operationalising relevant terms and constructs to give clarity to the reader. In addition, it would be advantageous for studies to draw together transdiagnostic processes and transdiagnostic approaches, so that the interventions and model-specific processes being evaluated clearly map onto the relevant transdiagnostic processes associated with long term neurological conditions. It is also worth being mindful of how theoretical developments within third-wave therapies can inform models of adjustment to neurological impairment, and in turn this can impact upon therapeutic targets and modalities at the clinical level.

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### **Conflict of Interest**

Paula L. Robinson has no conflicts of interest to disclose. Ailsa Russell has no conflicts of interest to disclose. Leon Dysch has no conflicts of interest to disclose.

### **Ethical standards**

This review did not involve direct human experimentation.

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