A Randomised Controlled Trial of Acceptance and Commitment Therapy and Cognitive-Behaviour Therapy for Generalised Anxiety Disorder

Elbina Avdagic,[1] Shirley A. Morrissey,[1,2] and Mark J. Boschen[1,2]

[1] *School of Applied Psychology, Griffith University, Gold Coast, Queensland, Australia*
[2] *Griffith Health Institute, Griffith University, Gold Coast, Queensland, Australia*

The study examined the relative efficacy of group acceptance and commitment therapy (ACT) for generalised anxiety disorder (GAD) compared to group cognitive-behavioural therapy (CBT). Fifty-one individuals with GAD were randomly allocated to a 6-week intervention, either ACT or CBT. Participants were assessed at pre-treatment, post-treatment, and 3-month follow-up on symptom measures, quality of life, and process measures. Data from 38 participants (19 in each group) were available at post-assessment, indicating significant improvements on all measures for both treatment conditions. Treatment gains were maintained at follow-up, with significant further improvements in anxiety, depression and stress symptoms for both groups. While no between-group differences were found at treatment completion, a significant interaction indicating steeper reduction in worrying symptoms ($d = .79$) from pre- to post-assessment was found for the ACT group compared to the CBT group. Furthermore, in relation to worrying, at treatment completion 78.9% of participants in the ACT group achieved reliable change compared to 47.4% of participants in the CBT group. However, both groups showed equivalent reliable change rates of 60% at the follow-up assessment. The results suggest that group ACT was as efficacious as group CBT. While participants in the ACT group maintained treatment gains at follow-up, participants in the CBT group continued to improve between post-assessment and follow-up.

■ *Keywords:* ACT, CBT, RCT, GAD, worrying, anxiety

Generalised anxiety disorder (GAD) is described as a chronic condition (Yonkers, Warshaw, Massion, & Keller, 1996), commonly associated with other disorders (Brown & Barlow, 1992), which leads to significant impairment in the everyday life of its sufferers (Kessler, Walters, & Witchen, 2004), and has a low probability of spontaneous recovery (Wittchenn & Hoyer, 2001). GAD has attracted increasing research interest over the past few decades (Boschen, 2008). While CBT is suggested as a preferred type of therapy for GAD (Ballenger et al., 2001) and several meta-analyses have supported its effectiveness in reducing general anxiety symptoms and pathological worrying in GAD sufferers (e.g., Borkovec & Ruscio, 2001; Covin, Ouimet, Seeds, & Dozois, 2008; Gould, Safren, Washington, & Otto, 2004; Westen & Morrison,

Address for correspondence: Associate Professor Shirley Morrissey, School of Applied Psychology and Griffith Health Institute, Griffith University, Gold Coast QLD 4222, Australia. Email: s.morrissey@griffith.edu.au

Behaviour Change | Volume **31** | Number **2** | 2014 | pp. 110–130 | © The Author(s), published by Cambridge University Press on behalf of Australian Academic Press Pty Ltd 2014 | doi 10.1017/bec.2014.5

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

2001), the percentage of GAD individuals who do not respond optimally to CBT is larger than for other anxiety disorders (Brown, Barlow, & Liebowitz, 1994). For instance, Newman and colleagues noted that CBT demonstrated the smallest average effect size for GAD in comparison with effect sizes of CBT for other anxiety disorders (Newman, Castonguay, Borkovec, Fisher, & Nordberg, 2008); and generally, only around 50% of GAD individuals reach high end-state functioning after treatment (Erikson & Newman, 2005).

In order to address these limitations and further enhance the outcomes for GAD individuals, a number of novel CBT-based approaches have been developed, including acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 1999; Hayes, 2004). Research has demonstrated that the application of ACT to mixed-anxiety disorders (including GAD) led to improvements that were comparable to CBT (e.g., Arch et al., 2012). At the same time, the expansion of ACT has triggered numerous debates around how different or similar ACT is to traditional CBT (Herbert & Forman, 2013). Researchers have suggested that the main difference between the two approaches lies in their theoretical explanations of psychopathology (Forman et al., 2012). ACT places an emphasis on psychological flexibility and argues that experiential avoidance — either struggle with, or an attempt to control, aversive internal experiences (e.g., thoughts, feelings and sensations) — is a central reason for developing psychopathology (Hayes et al., 1999). As a result, in order to increase psychological flexibility, the treatment focuses on present moment awareness, acceptance of unpleasant internal experiences, and promoting valued actions in areas that are important for a particular individual (Hayes et al., 1999). On the other hand, CBT pinpoints dysfunctional cognitions, arising from flawed information processing, as one of the main contributors to psychopathology (Forman et al., 2012). Forman et al. (2012) in their study that investigated unique and common mechanisms of change for ACT and CBT, concluded that 'psychological acceptance strategies' facilitated outcome for ACT, while 'cognitive and affective change strategies', such as cognitive restructuring, facilitated the outcome for CBT. Furthermore, the same authors noted that people's ability to distance themselves from their thoughts and not perceive them as absolute truths was a common factor in both interventions.

Currently, apart from a pilot study investigating ACT and CBT for GAD in older individuals (Wetherell et al., 2011), there are no published, randomised controlled trials of ACT and CBT focusing exclusively on GAD. However, another acceptance-based approach, developed specifically for GAD — acceptance-based behavioural therapy (ABBT; Roemer & Orsillo, 2005) — has been investigated in an open trial (Roemer & Orsillo, 2007), a randomised wait-list controlled trial (Roemer, Orsillo, & Salters-Pedneault, 2008), and a randomised controlled trial of ABBT and applied relaxation (Hayes-Skeleton, Roemer, & Orsillo, 2013). Results of a randomised controlled trial of ABBT for GAD using a wait-list control demonstrated its efficacy and indicated that 77% of participants achieved high end-state functioning at post-assessment, with these gains being maintained at both 3-month and 9-month follow-up (Roemer et al., 2008). Similarly, Hayes-Skeleton et al. (2013) found that between 63.3% and 80% of participants in ABBT demonstrated clinically significant change, which was comparable to changes in applied relaxation. Nevertheless, the recommendations from Roemer et al. (2008) and Powers, Zum Vörde Sive Vörding, and Emmelkamp (2009) that further research is necessary to determine the generalisability of the findings, and in particular to further compare the acceptance based therapies to active treatments for GAD, remains. While there is now evidence that

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

ACT can be effectively used for anxiety problems, research is still required comparing ACT with CBT to establish any advances in using ACT over CBT (Öst, 2008; Powers et al., 2009).

With the aim to address the lack of comparisons of ACT to gold standard active treatments, the current study compared a group-based ACT with a group-based CBT. Furthermore, as the successful treatment of GAD often requires the individuals to attend around 16 individual sessions, providing prolonged psychological interventions in communities or clinical settings is often difficult because of limited resources or people's inability to afford costly sessions (Glaser, Blackledge, Shepherd, & Deane, 2009). Therefore, the current research also investigated whether a brief group therapy would lead to significant improvements in symptoms and the quality of life of GAD sufferers for both groups. Finally, the research also examined the processes theorised to underline GAD, such as experiential avoidance, cognitive avoidance, intolerance of uncertainty and positive believes about worrying.

Based on previous research (e.g., Arch et al., 2012; Hayes-Skelton et al., 2013), it was hypothesised that both treatments would lead to significant and comparable improvements on symptom measures and quality of life and that these gains would be maintained at the follow-up. Furthermore, it was predicted that the ACT group would demonstrate greater changes on measures of experiential avoidance and intolerance of uncertainty compared to the CBT group, while equivalent results between the groups were expected on measures of cognitive avoidance and positive beliefs about worrying. We also hypothesised that applying a short, 6-week group therapy would lead to significant changes in outcome and process measures for both groups.

Method

Participants

Participants were individuals who met diagnostic criteria for GAD. They were recruited through community advertising (e.g., newspapers and flyers) and via emails at Griffith University, Queensland, Australia. Telephone screening interviews using the Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV; Di Nardo, Brown, & Barlow, 1994) were undertaken to confirm a GAD diagnosis according to the DSM-IV criteria (*Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition; American, Psychiatric Association, 1994). Participants with comorbid disorders, such as major depressive disorder (MDD) or other Axis 1 disorders, were included in the study, provided that GAD symptoms were in the clinical range and identified as being the primary problem. A decision about a principal diagnosis was based on the Clinical Severity Ratings (CSRs) and was determined by the study interviewers. Participants with psychotic symptoms, major deficits in neurocognitive functioning (e.g., learning disability), substance abuse or dependence, and current suicidal intent were excluded from the study.

Those eligible to participate were randomly assigned to either ACT or CBT group therapy interventions. Based on CONSORT guidelines for running and reporting randomised controlled trials (Moher, Schulz, & Douglas, 2001), Figure 1 shows the flow of participants throughout the study. Out of 64 individuals who met GAD diagnostic criteria and expressed interest in receiving therapy for their difficulties, 60 agreed to take part in the group treatments, while three participants decided to seek individual therapy. Furthermore, 10 participants, although initially agreeing to continue, withdrew from the study prior to the groups commencing. Various reasons

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

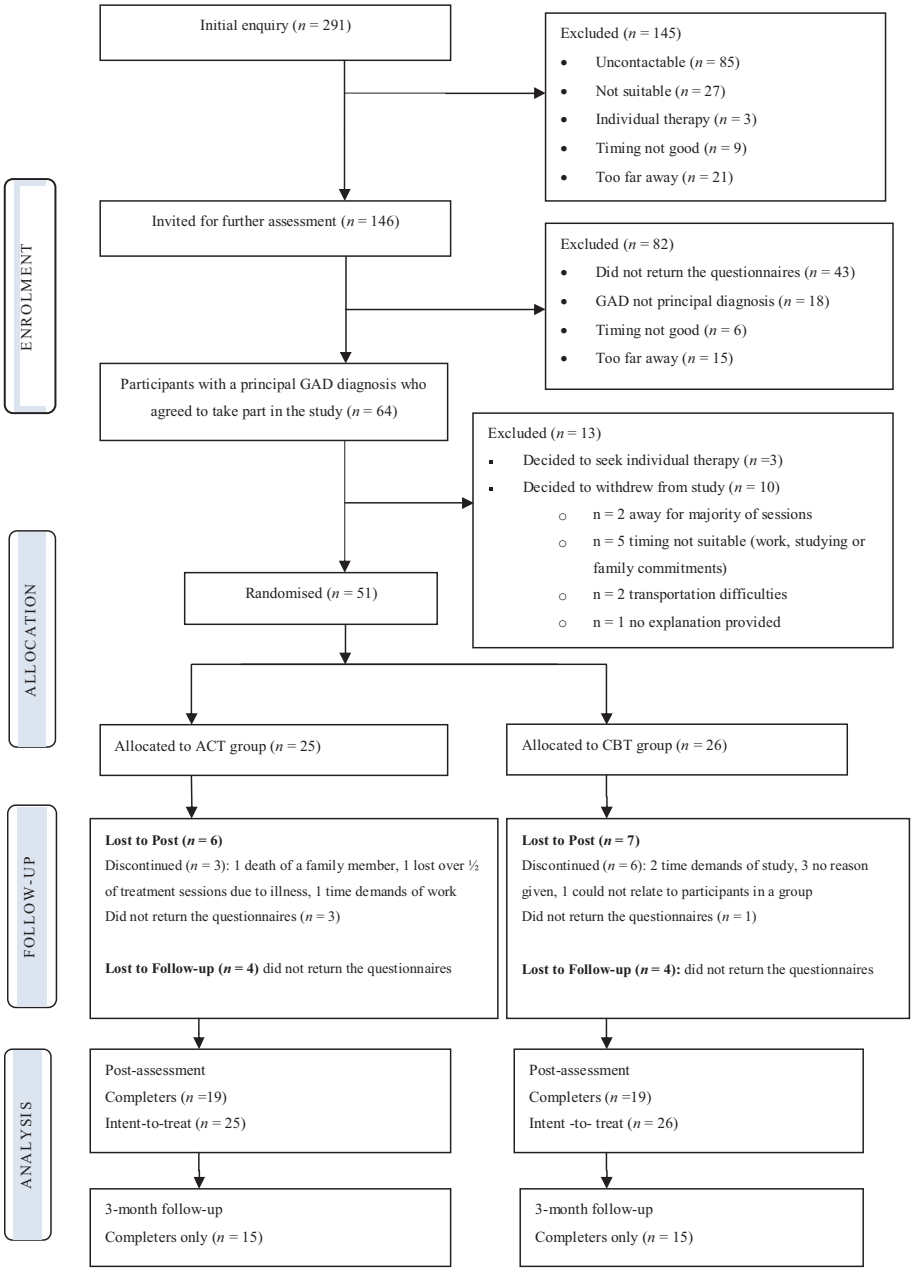


FIGURE 1

(Colour online) Flow of participants in a randomised controlled trial of acceptance and commitment therapy (ACT) and cognitive-behavioural therapy (CBT) for GAD.

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

were given, such as being away for the majority of sessions, transportation difficulties, or having other commitments. There were no significant differences between participants who withdrew from the study and those who commenced the group treatment on any demographic, outcome or process measures. These participants were not included in further analyses.

The remaining 51 participants (34 females and 17 males), aged between 19 and 69 years ($M = 36.17$, $SD = 13.1$), were randomly allocated either to the ACT group ($n = 25$) or CBT group ($n = 26$). More than half of the participants (57%) were employed either full or part time, 27% identified themselves as students, and 16% of participants reported being unemployed. The percentage of participants in a relationship compared to those who were single was similar (43% vs. 45%) with around 12% of participants separated or divorced. A majority of individuals taking part in the study (62.7%) claimed to have had previous psychological treatment. Among those, 46.9% reported having multiple treatments in the past, including counselling, CBT and mindfulness. In addition, 37.5% of participants reported having counselling only, 6.2% had CBT only, and 9.5% received counselling in combination with mindfulness. One participant did not specify the type of therapy she had received in the past. Around half of the participants were taking psychotropic medication (49%). Those individuals were allowed to take part in the interventions if they were on a stable dose and agent for at least 1 month for benzodiazepines and beta blockers, and 3 months for serotonin reuptake inhibitors (SSRIs), serotonin norepinephrine reuptake inhibitors (SNRIs), and heterocyclics. Participants were required not to change their medication intake until the study was finalised. The most commonly taken medication was SSRI antidepressants (60%). Four participants reported using a benzodiazepine (16%), while an equivalent number of participants were taking either SNRIs (8%) or tricyclic antidepressants (TCAs; 8%). One participant (4%) was using tetracyclic antidepressants (TeCAs) and one other individual was taking beta blockers (4%).

Nine participants discontinued their therapy during the study period, three from the ACT group (12%) and six from the CBT group (23%). Four participants, even though completing treatment, did not return their post-assessment questionnaires (three from the ACT group and one from the CBT group). Thus, with 13 participants either not completing the group interventions or not returning their questionnaires, complete data from 38 participants was available at post-assessment, 19 in the ACT group and 19 in the CBT group. While the number of people who dropped out of therapy across both interventions was high (25.5%), this attrition rate is similar to other studies, such as Arch et al. (2012). Participants who dropped out of therapy did not differ from those who completed treatment on any characteristics (demographics or clinical variables) or study measure.

Diagnostic Measures

Anxiety Diagnostic Interview Schedule. (ADIS-IV; Di Nardo et al., 1994). This ADIS-IV is a widely used semi-structured clinical interview that provides a comprehensive assessment of anxiety disorders. In addition to anxiety disorders, the ADIS-IV includes screening for mood disorders, substance use disorders, psychotic disorders and medical problems. It also provides a Clinical Severity Rating (CSR) for each diagnosis. This is a 9-point Likert scale with a range from 0 = *none* to 8 = *extreme interference/distress*. Ratings of 4 or higher indicate significant distress and impairment and allow for a diagnosis of GAD. The reported inter-rater reliability for principal

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

GAD diagnosis is $k = .67$ (Brown, Di Nardo, Lehman, & Campbell, 2001). In this study, the inter-rater reliability was not calculated as the ADIS-IV interviews were conducted over the phone and not recorded to allow a comparison between the assessors.

Outcome Measures

Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990). The PSWQ is a 16-item, self-reported measure of trait worry. It measures the degree to which worry is excessive, uncontrollable, and pervasive. Items are rated on a 5-point Likert scale ranging from 1 = *not at all typical of me* to 5 = *very typical of me*, with higher scores indicating higher levels of worry. The PSWQ has demonstrated good to very good internal consistency (coefficients alpha ranging from .86 to .93. across clinical and college samples) and adequate to good test-retest reliability (r = .74 to .93 across periods ranging from 2 to 10 weeks (Molina & Borkovec, 1994). In the current study, the internal consistency was very good, with $\alpha = .90$.

Depression, Anxiety and Stress Scale — 21 (DASS-21; Lovibond & Lovibond, 1995). Participants' levels of depression, stress and anxiety were assessed using the DASS-21. The DASS is a self-reported questionnaire with items rated on a 4-point Likert scale ranging from 0 = *did not apply to me at all* to 3 = *applied to me very much, or most of the time*. Higher scores suggest greater levels of depressive, anxiety and stress symptoms. The DASS has been found to have good internal consistency (α = .91, .84, .90 for depression, anxiety and stress, respectively; Lovibond & Lovibond, 1995). In the current study, the DASS-21 subscales demonstrated good internal consistency ($\alpha = .90$ for depression, $\alpha = .81$ for anxiety and $\alpha = .84$ for stress).

Quality of Life Inventory (QOLI; Frish, Cornwell, Villanueva, & Retzlaff, 1992). The QOLI measures participants' satisfaction with 16 areas of life (e.g., health, work, relationships, goals and values, romantic relationships, recreation). It is calculated in terms of its importance (0 = *not important*; 1 = *slightly important*, and 3 = *extremely important*) and levels of satisfaction (ranging from −3 = *very dissatisfied* to 3 = *very satisfied*). These results are then multiplied for each domain, giving an average satisfaction level across domains with a range from −6 to 6. The QLI demonstrated good internal consistency ($\alpha = .79$ in a community sample) and good test-retest reliability over a 2-week period, $r = .73$ (Frish, 1994). The internal consistency for the current study was good, with $\alpha = .83$.

Ratings Recorded During the Group Interventions

Self-reported ratings of distress and interference. To measure participants' perception of any changes in their levels of distress or interference of worrying on their everyday life over the course of treatment, a 9-point Likert scale was used. The scale range was from 0 = *none* to 8 = *extreme interference/distress*. The higher score indicated greater distress and interference. Similar to CSR, ratings of 4 or above were considered as an indication of significant difficulties. The ratings were recorded at the beginning of treatment (Session 1), at mid-treatment (Session 3) and at the end of treatment (Session 6).

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

Process Measures

Acceptance and Action Questionnaire (AAQ; Hayes et al., 2004). The AAQ was used to measure the construct of experiential avoidance. The questionnaire measures the extent of participants' accepting attitude toward negative feelings and experiences and ability to take action even when feeling uncertain. A 19-item version of AAQ was used. This allowed calculation of the single factor 9-item solution (AAQ-9) and 16-item dual factor solution — Action and Willingness factors (Bond & Bunce, 2003). Participants rated items on a 7-point Likert scale ranging from 1 = *never true* to 7 = *always true*, with higher scores indicated greater acceptance of negative feelings and experiences. The AAQ has demonstrated acceptable internal consistency ($\alpha = .70$) and test-retest reliability ($r = .64$) over a 4-month period (Hayes et al., 2004). In the current study, internal consistency was similar with $\alpha = .70$ for AAQ-9, and $\alpha = .69$ for both action and willingness subscales.

Intolerance of Uncertainty (IUS; English translation: Buhr & Dugas, 2002). The IUS is a 27-item, self-reported measure designed to assess several aspects of intolerance of uncertainty, such as ideas that uncertainty is not acceptable and leads to frustration, stress and inability to take action. Items are rated on a 5-point Likert scale ranging from 1 = *not at all characteristics of me* to 5 = *entirely characteristic of me*. Higher scores indicate greater intolerance of uncertainty. The English translation of the IUS has demonstrated very good internal consistency in a sample of college students, $\alpha = .94$, and good test-retest reliability over a period of 5 weeks, $r = .74$ (Buhr & Dugas, 2002). Similar results for internal consistency were obtained in the current study with $\alpha = .96$.

Cognitive Avoidance Questionnaires (CAQ; English translation: Sexton & Dugas, 2008). Cognitive avoidance was measured by the CQA, a 25-item, self-reported measure that includes five cognitive avoidance strategies: suppressing worrisome thoughts, substituting neutral and positive thoughts for worry, avoidance of threatening stimuli, distraction, and transformation of images into thoughts. The items are rated on a 5-point Likert scale and range from 1 = *not at all typical* to 5 = *completely typical*. The CAQ has shown very good internal consistency ($\alpha = .95$) and good test-retest reliability over a 4- to 6-week period, $r = .85$ (Sexton & Dugas, 2008). In the current study, the internal consistency for the scale was very good with $\alpha = .96$.

Why Worry-II (WW-II: English translation: Holowka, Dugas, Francis, & Langesen, 2000). To measure perceived positive consequences of worry, the WW-II was administered. The WW-II is a 25-item revised version of the earlier Why Worry scale (WW). Participants indicate how much they agree with each statement on a 5-point Likert scale ranging from 1 = *not at all characteristic of me* to 5 = *entirely characteristic of me*. Holowka et al. (2000) reported very good internal consistency for the total WW-II ($\alpha = .93$). Similar results were obtained in the current study, with $\alpha = .95$ for the total scale.

Procedure

The study was approved by the Griffith University Human Research Ethics Committee. Participants who met criteria for GAD were invited to take part in GAD group treatment at Griffith University, Queensland, Australia. Diagnostic interviews were conducted over the phone by a clinical psychologist not otherwise involved in the current study, and a registered psychologist and doctoral level student in clinical

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

TABLE 1

A Brief Outline of ACT and CBT Group Protocol for GAD

Session	ACT	CBT
1	Creative hopelessness: introducing the experiential nature of the treatment and unworkability of a rigid control agenda	The nature of GAD; Learning how to recognise your own anxiety; Triggers and maintain factors
2	Control is the problem and introduction to the why and how of willingness	The purpose and function of GAD; Learning to relax; Introduction to changing anxious thoughts
3	Building acceptance by defusing language and introduction to values	Controlling thoughts that cause anxiety: overestimating risks and thinking the worst; Cognitive restructuring
4	Building acceptance by developing self as context and value-guided exposure	Direct worry control — worry exposure; Behavioural experiments; Introceptive exposure
5	Value-guided behaviour in the real world	From worry exposure to worry prevention — addressing 'safety' behaviours; Dealing with real life problems (e.g., procrastination)
6	Staying committed to the value-guided behaviour	Your accomplishment and your future

psychology. Participants were also required to complete a questionnaire booklet that was mailed to them. Participants were randomly assigned to either CBT or ACT condition using simple randomisation. The randomisation process was conducted by the first author with the leading group therapist blind to the randomisation procedure. The current study did not use a wait-list control group. The decision was based on a suggestion that the comparison of a relatively new treatment and a well-established one does not need to include a control group (Kazdin, 2002).

Each treatment condition was delivered in a group format and conducted across 6 weeks. Sessions lasted for 2 hours. Participants were assessed before starting the group treatment (pre-assessment), after completing the program (post-assessment) and then again at 3-months' follow-up. A total of 12 groups (6 ACT and 6 CBT) were conducted. The groups were small in size and included between four and six participants per group. For individuals who missed a group session, an individual meeting was scheduled to go through missed material and exercises. Participants received treatment free of charge. No incentives were given to participants for taking part in the study.

Both groups followed previously developed anxiety treatment manuals. The CBT group was based on Zinbarg, Craske, Barlow, and O'Leary's (1993) manual for GAD, while the ACT group was founded on Eifert and Forsyth's (2005) and Forsyth and Eifert's (2007) anxiety manuals. The ACT group also followed a 6-week session group structure proposed by Glaser, Blackledge, Shepherd, and Deane (2009). Table 1 briefly outlines the session content for both interventions across 6 weeks.

The CBT group focused on targeting cognitive biases, physiological arousal and avoidance behaviour (Zinbarg et al., 1993), while the ACT group protocol placed an emphasis on accepting thoughts and feelings and living a life consistent with

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

one's values (Forsyth & Eifert, 2007). In both groups, participants were required to practise relevant skills between the sessions (e.g., progressive muscle relaxation and challenging unhelpful thinking in the CBT group, and mindfulness and cognitive defusion in the ACT group).

Therapists

To control for therapist effect confounds, each session for both groups was conducted jointly by the same therapists. Author (SM) is a practising clinical and health psychologist and academic, with over 25 years' experience in CBT and has also undertaken training in ACT. Author (EA), a registered psychologist and doctoral level student in clinical psychology, was trained and supervised in CBT at Griffith University as a part of her degree requirement. She has also completed ACT training (2-day introductory and 2-day advanced workshops) between 2008 and 2010. Supervision sessions were provided weekly in 2-hour sessions.

Treatment Fidelity and Competence

The Drexel University ACT/CBT Therapist Adherence and Competence Rating Scale (DUACRS: McGrath et al., 2005) was used to assess treatment fidelity. The DUACRS is designed to assess therapist practices specific to ACT and CBT, as well as some general therapist behaviours. For the purpose of the current study, only practices related specifically to ACT and CBT, as well as the therapist competence subscale, were evaluated rather than general therapist behaviours. The ACT and CBT subscales showed very good inter-rater reliability, as measured by the intra-class correlation coefficient (ICC = .96 for ACT and ICC = .94 for CBT) and internal consistency (α = .93 for ACT and α = .91 for CBT). The inter-rater reliability for the competence subscale was found to be good with ICC = .86, while the internal consistency was very good with α = .95 (McGrath et al., 2005). In the current study, the internal consistency of the competence subscale and intra-class correlation were good (α = .83 and ICC = .86). Furthermore, the inter-rater agreement relating to whether specific ACT- or CBT-related skills were used within a particular session was assessed using kappa. The inter-rater reliability for the current study was good with a kappa value of .74.

In the current study, 20% of randomly selected, digitally recorded sessions were rated by two independent clinical psychologists who were trained both in ACT and CBT and who had no other involvement with the current study. The independent ratings indicated a 100% adherence to treatment protocols for each of the groups. The therapist's competence was assessed in relation to five skills: 'knowledge of treatment', 'skill in delivering treatment', 'appropriate application of treatment components within the context of session', 'relationship with the client', and 'overall performance'. Each skill was rated on a 5-point Likert scale. Similar scores were obtained for each group treatment. For the ACT group, the knowledge of treatment was rated as 4.8, the skill in delivering treatment as 4.5, the appropriate application of treatment components as 4.4, and the relationship with participants as 4.2. The CBT received the following ratings: 5 for the knowledge of treatment, 4.8 for the skill in delivering treatment, 4.6 for the appropriate application of treatment components, and 4.2 for the relationship with participants. Finally, the overall competence was judged to be 4.4 for the ACT group and 5 for the CBT group.

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

TABLE 2

Comparisons of Demographic and Clinical Characteristics at Pre-Assessment for ACT and CBT Groups

	ACT ($n = 25$)	CBT ($n = 26$)	χ^2 or t	p
Age *M* (*SD*/				
Gender *n* (%)				
Female	19 (72.0)	15 (57.7)	1.92	.166
Male	6 (28.0)	11 (42.3)		
Marital status *n* (%)				
Married/de-facto	13 (52.0)	9 (34.6)	3.51	.173
Single	8 (32.0)	15 (57.7)		
Separated/divorced	4 (16.0)	2 (7.7)		
Employment *n* (%)				
Full time	7 (28.0)	9 (34.6)	3.99	.262
Part time	5 (20.0)	8 (30.8)		
Student	10 (40.0)	4 (15.4)		
Unemployed	3 (12.0)	5 (19.2)		
Previous treatment *n* (%)				
Yes	18 (72.0)	15 (57.7)	1.14	.285
No	7 (28.0)	11 (42.3)		
Current medication *n* (%)				
Yes	12 (48.0)	13 (52.0)	0.02	.868
No	13 (50.0)	13 (50.0)		
Additional diagnosis				
Yes	15 (60.0)	19 (73.1)	0.98	.322
No	10 (40.0)	7 (26.9)		
GAD CSR *M (SD*)	5.8 (2.0)	6.1 (1.4)	-0.51	.613

Note: GAD (CSR) = Generalised Anxiety Disorder (Clinical Severity Rating)

Results

Data were analysed using Statistical Package for the Social Sciences (SPSS) Version 20 for Windows. To check the comparability of participants in the ACT and CBT group at pre-assessment, a series of independent group *t* tests and chi-square tests were conducted. As indicated in Tables 2, 3 and 4, no significant differences between the groups on any demographic characteristics, clinical ratings, outcome or process measures were found.

Pre- to post-assessment analyses were performed in two ways: using only completion data with 38 participants and on an intent-to-treat (ITT) basis including all 51 participants. ITT analyses were conducted using the last-observation-carry-forward method. This method is based on the conservative hypothesis that individuals who discontinued treatment experienced no change. The effects of treatment type on symptoms (worrying, anxiety, stress, and depression), process measures (positive beliefs about worrying, experiential avoidance, intolerance of uncertainty, cognitive avoidance, and fear of experiencing emotions) and quality of life of GAD individuals,

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

TABLE 3

Comparisons of Outcome Variables at Pre-Assessment Between ACT and CBT Groups

Measures	Group	*N*	*M*	*SD*	*t*	*p*
PSWQ	ACT	25	67.6	8.9	0.15	.877
	CBT	26	67.2	8.0		
DASS-21 Stress	ACT	25	28.5	8.7	1.10	.275
	CBT	26	25.9	8.4		
DASS-21 Anxiety	ACT	25	18.7	8.6	0.49	.629
	CBT	26	17.5	8.8		
DASS-21 Depression	ACT	25	17.8	8.3	-0.57	.569
	CBT	26	19.4	10.7		
QOLI	ACT	21	30.9	13.7	0.09	.932
	CBT	26	30.6	12.5		

Note: PSWQ = Penn State Worry Questionnaire, DASS = Depression, Anxiety and Stress Scale, QOLI = Quality of Life Inventory.

TABLE 4

Comparisons of Process Measures at Pre-assessment Between ACT and CBT Groups

Measures	Group	*N*	*M*	*SD*	*t*	*p*
WW-II Total	ACT	24	67.8	19.4	−0.25	.800
	CBT	26	69.3	21.4		
	CBT	26	13.7	4.6		
IUS	ACT	25	86.9	18.7	0.18	.857
	CBT	26	85.9	20.4		
	CBT	26	17.6	5.2		
AAQ-9	ACT	24	27.6	6.9	−0.70	.485
	CBT	26	28.8	5.7		
CAQ	ACT	25	71.8	19.2	−0.07	.942
	CBT	26	72.3	22.7		

Note: WW-II = Why Worry — II Questionnaire, IUS = Intolerance of Uncertainty Scale, AAQ = Action and Acceptance Questionnaire, CAQ = Cognitive Avoidance Questionnaire.

was analysed using a series of 2 (group: ACT vs. CBT) × 2 (time: pre-assessment and post-assessment) mixed factorial analyses of variance (ANOVA). Another set of 2 × 2 mixed factorial ANOVAs were conducted to examine changes from the post-assessment to 3-month follow-up in order to identify any maintenance of treatment effects. In addition, to investigate changes in ratings of distress and interference over the course of therapy, 3 (time: Session 1, Session 3, and Session 6) × 2 (group: ACT vs. CBT) mixed factorial ANOVA was performed.

Effect sizes were calculated using partial eta squared (η^2), which indicates the proportion of variance accounted for by the main effect or interaction. In addition, to facilitate comparison with other efficacy studies, Cohen's *d* was also computed (Figure 2) for within-group repeated measures effects using the Effect Size Generator for Windows: version 2.3 (Devilly, 2004).

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

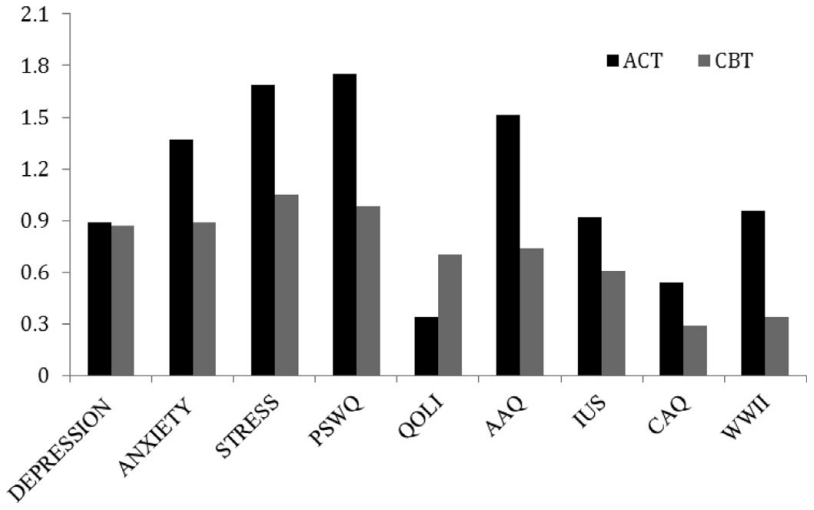


FIGURE 2

Effect sizes (*d*) comparing ACT and CBT from pre- to post-assessment on all study measures.

Comparison Between the ACT Group and CBT Group From Pre- to Post-Assessment

Table 5 provides a summary of means and standard deviations for all measures at each assessment point. It also presents within-group effect sizes (*d*) for completers at post-assessment and follow-up for each intervention group.

Outcome Measures

Worrying (PSWQ; Meyer* et al., *1990). For the PSWQ there was a significant main effect of time, indicating significant reductions in pre- to post-levels of worrying across both groups, $F(1, 36) = 59.90$, $p < .001$, partial $\eta^2 = .625$. Furthermore, a significant interaction was found between the group and time, $F(1, 36) = 4.95$, $p = .032$, partial $\eta^2 = .121$. Simple effect analysis showed a greater reduction of worrying at post-assessment for the ACT intervention compared to the CBT intervention; however, the found difference did not reach statistical significance, $F(1, 36) = 3.64$, $p = .064$, partial $\eta^2 = .092$.

PSWQ: ITT. Similar results for the PSWQ were obtained using the ITT analysis. A significant reduction in worrying symptoms from pre- to post-assessment was found across both groups, $F(1, 49) = 42.54$, $p < .001$, partial $\eta^2 = .465$. While time × group interaction only approached statistical significance, $F(1, 49) = 3.97$, $p = .052$, partial $\eta^2 = .075$, the effect size of the difference was moderate and suggested a sharper decline in worrying from pre- to post-treatment for the ACT group compared to the CBT group. No main effect of group was found, $F(1, 49) = 1.51$, $p = .289$, partial $\eta^2 = .023$.

Depression, Anxiety, and Stress (DASS-21; Lovibond & Lovibond, 1995). The results showed a significant main effect of time from pre- to post-assessment, suggesting that participants across the two groups reported significantly lower levels of depression,

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

TABLE 5

Means, Standard Deviations and Within Group Effect Sizes for All Measures (Completers Data)

Outcome measures	Group	Pre M (SD)	Post *M (SD)*	Follow-up *M (SD)*	*d* (post)	*d* (follow-up)
PSWQ	ACT	67.68 (8.5)	50.95 (10.5)	52.20 (12.3)	1.75	1.56
	CBT	66.63 (8.3)	57.37(10.3)	52.47 (14.5)	0.98	1.00
DASS Depression	ACT	17.26 (9.2)	9.47 (8.5)	6.47 (6.2)	0.89	1.36
	CBT	17.68 (10.1)	9.89 (6.5)	4.87 (5.0)	0.87	1.36
DASS Anxiety	ACT	19.26 (8.2)	8.42 (7.7)	6.00 (4.7)	1.34	2.02
	CBT	16.63 (9.4)	9.05 (6.8)	4.33 (4.7)	0.89	1.82
DASS Stress	ACT	28.95 (8.1)	15.47 (7.8)	8.80 (5.6)	1.69	2.86
	CBT	24.95 (8.8)	16.11 (8.0)	7.70 (5.0)	1.05	1.81
QOLI	ACT	32.69 (14.0)	37.31 (12.9)	39.69 (14.5)	0.34	0.37
	CBT	30.11(12.4)	38.22 (10.5)	40.62 (12.4)	0.70	0.81
AAQ-9	ACT	27.89 (7.2)	37.47 (5.3)	36.13 (7.7)	1.51	1.42
	CBT	28.74 (5.9)	33.89 (7.5)	36.13 (8.0)	0.74	0.95
AAQ Willingness	ACT	20.89 (4.3)	29.68 (5.24)	28.6 (7.3)	1.83	1.27
	CBT	20.89 (6.2)	25.89 (6.6)	26.5 (6.0)	0.78	0.99
AAQ Action	ACT	34.58 (6.6)	39.63 (4.8)	38.47 (8.7)	0.84	0.48
	CBT	36.84 (5.4)	39.26 (6.7)	40.73 (6.4)	0.43	0.49
IUS	ACT	85.72(20.4)	64.50 (23.71)	63.36 (27.0)	0.92	1.07
	CBT	86.00 (20.0)	73.16 (21.75)	66.20 (24.1)	0.61	0.78
WW-II total	ACT	64.68 (18.7)	48.11 (14.66)	47.73 (15.8)	0.96	1.25
	CBT	67.47 (22.1)	59.53 (16.82)	55.73 (22.7)	0.34	0.40
CAQ total	ACT	70.78 (20.6)	59.78 (20.45)	56.33 (23.2)	0.54	0.68
	CBT	69.58 (21.9)	63.37 (20.27)	61.53 (25.5)	0.29	0.31

Note: PSWQ = Penn State Worry Questionnaire, DASS = Depression, Anxiety and Stress Scale, QOLI = Quality of Life Inventory, AAQ = Action and Acceptance Questionnaire, IUS = Intolerance of Uncertainty Scale, WW-II = Why Worry II Questionnaire, CAQ = Cognitive Avoidance Questionnaire, ACS = Affective Control Scale.

$F(1,36) = 31.75$, $p < .001$, partial $\eta^2 = .469$, fewer anxiety symptoms, $F(1, 36) = 53.55$, $p < .001$, partial $\eta^2 = .600$, and fewer stress symptoms, $F(1, 36) = 64.68$, $p < .001$, partial $\eta^2 = .642$, after completing the group treatments. No significant time × group interaction and no main effect of group were found for any of the DASS subscales.

DASS-21: ITT. The ITT analyses also revealed significant main effect of time for each of the DASS subscales across both group. Participants reported significantly lower levels of depressive symptoms, $F(1, 49) = 26.31$, $p < .001$, partial $\eta^2 = .349$, anxiety, $F(1, 49) = 39.65$, $p < .001$, partial $\eta^2 = .447$, and stress, $F(1, 49) = 45.12$, $p < .001$, partial $\eta^2 = .479$ from pre- to post-assessment. There was no significant main effect of group, and no interaction effect found for the DASS subscales.

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

***Quality of Life (QOLI; Frish* et al., *1992*).** A significant improvement in quality of life was noted across both groups from pre- to post-assessment, $F(1, 32) = 10.71$, $p = .003$, partial $\eta^2 = .251$. There was no main effect of group $F(1, 32) = .048$, $p = .828$, partial $\eta^2 = .001$ and no interaction between group and time $F(1, 32) = .803$, $p = .377$, partial $\eta^2 = .024$.

Quality of Life: ITT. Comparable results were obtained using the ITT sample. Participants reported better quality of life at post-assessment across both interventions, $F(1, 45) = 7.81$, $p = .008$, partial $\eta^2 = .148$. No main effect of group, $F(1, 45) = 0.00$, $p = .985$, partial $\eta^2 = .000$, and no interaction between group and time, $F(1, 45) = .078$, $p = 0.78$, partial $\eta^2 = .002$, was found.

Ratings of Distress and Interference (ITT)

The results of a 3 × 2 mixed factorial ANOVA revealed a significant main effect of time on distress ratings, $F(2,98) = 24.96$, $p = .000$, partial $\eta^2 = .337$, indicating that participants' levels of distress lowered over the course of treatment across both groups. There was a significant time × group interaction, $F(2, 98) = 3.50$, $p = .038$, partial $\eta^2 = .067$. Also, a significant main effect of group was found, $F(1, 49) = 4.93$, $p = .031$, partial $\eta^2 = .091$. Simple effect analysis showed that the groups differed at reported distress levels in the last treatment session, with the ACT group showing significantly lower levels of distress compared to the CBT group, $F(1,49) = 8.44$, $p = .005$, partial $\eta^2 = .147$.

A second 3 × 2 mixed factorial ANOVA for ratings of interference of GAD symptoms on participants' everyday life was calculated. Significant main effect of time was also found, $F(2, 98) = 26.15$, $p = .000$, partial $\eta^2 = .348$, showing that participants, across both groups, reported lower levels of interference of their symptoms with everyday life activities over the course of therapy. There was no main effect of group, $F(1, 49) = 2.85$, $p = .098$, partial $\eta^2 = .055$. The results indicated a significant interaction effect, suggesting a steeper changes in interference for the ACT group compared to the CBT group, $F(2, 98) = 5.60$, $p = .003$, partial $\eta^2 = .109$. Simple effect analysis demonstrated a significant difference between the groups in Session 6, $F(1, 49) = 8.82$, $p = .005$ partial $\eta^2 = .153$, with participants in the ACT group reporting lower levels of interference compared to the CBT group.

Process Measures

***Experiential avoidance (AAQ: Hayes* et al., *2004*).** The results showed a significant main effect of time for the AAQ-9, $(1, 36) = 42.8$, $p < .001$, partial $\eta^2 = .543$, indicating greater experiential acceptance across both groups at the end of treatment. Similar results were obtained for the action and willingness subscales, whereby participants reported a significant increase in their acceptance of unwanted experiences from pre- to post-assessment across both groups; action subscale, $F(1, 36) = 30.63$, $p < .001$, partial $\eta^2 = .460$; and willingness subscale, $F(1, 36) = 52.31$, $p < .001$, partial $\eta^2 = .592$.

Even though no significant time × group interaction was found for the AAQ-9, $F(1, 36) = 3.85$, $p = .057$, partial $\eta^2 = .097$; action subscale, $F(1, 36) = 3.80$, $p = .059$, partial $\eta^2 = .095$; or willingness subscale, $F(1, 36) = 3.95$, $p = .055$, partial $\eta^2 = .099$, the obtained effect sizes were moderate, suggesting greater magnitude of change from pre- to post-assessment for the ACT group compared to the CBT group. There

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

was no main effect of group for either the AAQ-9 scale or the action and willingness subscales.

AAQ: *ITT*. The mixed factorial analysis for the AAQ-9 using the ITT data showed the main effect of time, $F(1, 48) = 45.79$, $p < .001$, partial $\eta^2 = .488$, with greater experiential acceptance across both treatment interventions from pre- to post-treatment. A similar trend of steeper increase in acceptance and action subscales for the ACT group compared to the CBT group was noted for the ITT sample as well.

Positive beliefs about worrying (WW-II; English Translation: Holowka et al., 2000). A significant main effect of time for the total score on the WW-II was found, demonstrating a significant decrease in positive beliefs about worrying from pre- to post-assessment across both groups, $F(1, 36) = 25.39$, $p < .001$, partial $\eta^2 = .414$. There was no significant time × group interaction, $F(1, 36) = 3.14$, $p = .085$, partial $\eta^2 = .080$, and no main effect of group, $F(1, 36) = 1.73$, $p = .197$, partial $\eta^2 = .046$. Nevertheless, while the interaction effect was not significantly different, a trend of steeper decrease on this measure was found for the ACT group relative to the CBT group.

WW-II: ITT. The results of the ITT analysis for the WW-II total showed the main effect of time, $F(1, 49) = 22.57$, $p < .001$, partial $\eta^2 = .320$, with participants across the groups reporting reduced beliefs in positive benefits of worrying from pre- to post-assessment. There was no main effect of group, $F(1, 49) = .94$, $p = .335$, partial $\eta^2 = .019$, and no time × group interaction, $F(1, 49) = 3.37$, $p = .073$, partial $\eta^2 = .066$. Once more, the interaction effect size was moderate, suggesting steeper changes for the ACT group.

Intolerance of Uncertainty (IUS; English translation: Buhr & Dugas, 2002). The results demonstrated a significant main effect of time, $F(1, 35) = 68.21$, $p < .001$, partial $\eta^2 = .661$, showing participants' greater ability to handle uncertainty after treatment completion compared to pre-assessment across both groups. Time × group interaction approached significance, $F(1, 37) = 4.13$, $p = .050$, partial $\eta^2 = .106$, indicating greater increase in tolerating uncertainty for participants in the ACT group as opposed to the CBT group. No main effect of group, $F(1, 35) = .440$, $p = .511$, partial $\eta^2 = .012$ was found.

Intolerance of Uncertainty: ITT. Correspondingly, the mixed factorial analysis on the IUS, using the ITT data, showed a significant main effect of time, $F(1, 48) = 45.79$, $p < .001$, partial $\eta^2 = .488$, whereby a greater tolerance of uncertainty was reported by participants from pre- to post-assessment across both groups. While the ACT group demonstrated a steeper improvement with moderate effect size, the difference found did not reach statistical significance, $F(1, 48) = 3.05$, $p = .087$, partial $\eta^2 = .060$. There was no main effect of group, $F(1, 48) = .21$, $p = .651$, partial $\eta^2 = .004$.

Cognitive avoidance. The results on the CAQ showed a significant main effect of time, $F(1, 35) = 11.39$, $p = .002$, partial $\eta^2 = .245$, suggesting that both treatment groups demonstrated a significant reduction in using cognitive avoidance strategies at treatment completion. There was no significant time × group interaction, $F(1, 35) = .882$, $p = .354$, partial $\eta^2 = .025$, and no main effect of group, $F(1, 35) = .035$, $p = .852$, partial $\eta^2 = .001$.

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

TABLE 6

Reliable Change and Clinical Significance at Post Assessment

Measures	ACT	CBT	χ^2	p
	Reliable Change Index			
PSWQ	15/19 (78.9%)	9/19 (47.4%)	4.07	.044
DASS-21 Anxiety	15/19 (78.9%)	12/19 (63.2%)	1.15	.283
DASS-21 Stress	16/19 (84.2%)	10/19 (52.6%)	4.38	.036
	Reliable Change and Clinical Significance			
PSWQ	14/19 (73.7%)	8/19 (42.1%)	3.89	.049
DASS-21 Anxiety	11/19 (57.9%)	8/19 (42.1%)	0.95	.330
DASS-21 Stress	9/19 (47.4%)	6/19 (31.6%)	0.99	.319

Note: PSWQ = Penn State Worry Questionnaire, DASS-21 = Depression, Anxiety and Stress Scale.

***Cognitive Avoidance*: ITT.** Similar results were obtained in the ITT analysis, with a significant main effect of time, $F(1, 49) = 12.14$, $p = .001$, partial $\eta^2 = .199$, and no significant time × group interaction and no main effect of group.

Maintenance of Treatment Effects: Comparisons Between ACT and CBT from Post- to 3-Month Follow-Up

Treatment benefits were maintained at 3-month follow-up for both worrying and quality of life, while further significant improvements were found in relation to depression, $F(1, 28) = 6.25$, $p = .019$, partial $\eta^2 = .183$, anxiety, $F(1, 28) = 8.92$, $p = .006$, partial $\eta^2 = .242$, and stress symptoms, $F(1, 28) = 47.26$, $p < .001$, partial $\eta^2 = .628$, across both groups. No significant time × group interactions or main effect of group was found for any of the outcome measures at the follow-up assessment. Similarly, significant treatment gains reported on process measures at post-assessment were sustained at the follow-up.

Clinical Significance and Reliable Change

To investigate whether clinically significant and/or reliable change occurred for individual participants, as suggested by Jacobson and Truax (1991), the Reliable Change Index (RCI) and clinical significance change (CS) were calculated. Jacobson and Truax's (1991) formula for calculating the RCI was used (RCI = [pre-test – post-test score]/standard error of measurement). To achieve RCI, participants needed to improve more than two standard deviations on any particular measure (cut-off score > 1.96). In addition, clinically significant change was reached if participants' scores at post-assessment were more likely to belong to functional than to dysfunctional population and was calculated using Jacobson and Truax's (1991) formula. The same formulae were used for determining change at 3-month follow-up. The RCI and CS for each of the symptom measures at post-assessment are presented in Table 6.

In relation to worrying, at post-assessment 78.9% of participants from the ACT group reached reliable change (RCI > 1.96) compared to 47.4% of participants in the CBT group. Furthermore, 73.7% of participants in the ACT group achieved both reliable change and clinical significance relative to 42.1% of participants in the CBT

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

group. However, there were no differences between the two interventions at the follow-up assessment, with both groups achieving reliable change rates of 60%.

Discussion

The study investigated the relative efficacy of the group ACT intervention compared to the group CBT for GAD. The results suggested that each treatment condition demonstrated significant improvements on all measures from pre- to post-assessment. Furthermore, the obtained benefits were maintained at 3-month follow-up, with further gains on the DASS-21 for both groups. These findings imply that a short, 6-week group therapy, either ACT or CBT, can lead to significant progress in outcomes among GAD individuals. Apart from the measure of quality of life, whereby a moderate effect size was recorded ($d = 0.5$), the changes on the outcome measures indicated large effect sizes. The results might be particularly relevant for community settings where psychological resources are often limited and longer therapy is often not feasible.

When compared to each other, both groups showed similar improvements in participants' reported levels of depression, stress, anxiety, and quality of life from pre- to post-assessment. These results are comparable to other randomised controlled trials of ACT and CBT, such as Forman, Herbert, Moitra, Yeomans, and Geller (2007) and Arch et al. (2012). Both of these studies found that ACT and CT/CBT interventions achieved similar improvements at treatment completion on either anxiety specific measures or broader outcomes (e.g., quality of life). In addition, the above treatment benefits obtained in the current study at the end of the group interventions were either maintained or further improved at 3-month follow-up, with no significant differences between the two groups.

Furthermore, participants in both groups reported a significant reduction in their worrying symptoms from pre- to post-assessment. However, the ACT group demonstrated significantly steeper gains over the course of treatment, with moderate interaction effect size ($d = .79$), compared to the CBT group. While the ACT group initially achieved greater improvements in participants' worrying symptoms, this difference was not evident at the follow-up, with both groups showing comparable results on the PSWQ. Equally, the changes in distress and interference over the course of therapy were greater for the ACT than for the CBT condition. Similar results were achieved in relation to reliable change and clinical significance rates. While a larger number of participants in the ACT group were considered improved or recovered at the end of treatment compared to the CBT groups, no differences between the groups were recorded at the follow-up, with participants in the CBT group continuing to improve from post- to follow-up assessment. These findings might suggest that ACT delivered in a group format can lead to rapid clinical changes for individuals with GAD in a short period of time, especially in relation to worrying. While the CBT group achieved comparable results at the follow-up, it seemed that the clinical changes in CBT were more gradual compared to ACT, and that participants in the CBT group needed more time to practise the CBT skills. This might also be the case due to conducting worry exposure exercises in the CBT group towards the end of the intervention (week 4 and week 5), and thus not allowing enough practice for participants to report greater changes at the post-assessment.

In relation to process measures, and consistent with the hypotheses, the findings indicated that although both groups reported greater acceptance of distressing thoughts, sensations and feelings, and increased tolerance of uncertainty at the end

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

of treatment, a trend towards a steeper increase on these measures with moderate effect sizes was recorded for the ACT group compared to the CBT group. Equivalent improvements were found on a measure of cognitive avoidance, whereby participants in both groups reported less avoidance of cognitive and emotional materials. These results are consistent with the proposition that ACT might achieve changes through decreasing experiential avoidance and that CBT results might be attributable to affective and cognitive changes (Forman et al., 2012). All treatment gains on process measures were maintained at the follow-up assessment.

The main limitation of the current study is a small sample size that makes it hard to detect possible significant differences between the groups due to limitations of statistical power. Unfortunately, even the preparation strategies to overcome this problem did not achieve the wanted effect, due to the fact that this was research was conducted for a postgraduate degree, with limited resources that did not allow the continuation of participants' recruitments until predetermined numbers were met. Another limitation was in not calculating inter-rater reliability for ADIS interviews. However, all interviews were performed by either an experienced clinical psychologist or registered psychologist with at least 2 years of clinical practice. In addition, regular daily discussions were scheduled, particularly around those interviews that raised some uncertainty regarding a diagnosis. Those cases were discussed in detail and mutual agreement about a diagnosis was made. Furthermore, the ADIS-IV and CSRs were not administered at post-assessment. As the groups' treatment included only six sessions, we believed that insufficient time had passed since their initial interview for the ADIS-IV to be readministered. However, we did measure possible changes in severity of symptoms and their interference with everyday life, using a self-reported measure that was administered in Session 1, Session 3, and Session 6. While we acknowledge the limitations in using self-report measures, this is common practice in much psychological research. Inclusion of longer follow-up (e.g., 12 months) would provide important information about the long-term efficacy of both treatment interventions. While therapists' allegiance with either ACT or CBT was not assessed, adherence ratings evaluated by the independent assessors indicated 100% adherence to each of those treatment conditions. Furthermore, there were no statistically significant differences in therapists' competences between the treatment groups, suggesting that therapist variables did not influence the study results.

In summary, to add to the limited number of published data comparing ACT to other active treatments, such as traditional CBT, the current randomised controlled trial explored the efficacy of the group ACT to the group CBT for GAD. The study also investigated whether satisfactory outcomes can be achieved in a group format and over a short period of time. Overall, the study demonstrated that ACT for GAD is as efficacious as the gold-standard CBT treatment for GAD. The excellent outcomes with large effect sizes that were achieved in a short-term group format should encourage the use of this cost-effective treatment approach. This was particularly evident for the ACT group, whereby the majority of participants showed clinical improvements at the end of treatment. Similar improvement rates were achieved at 3-month follow-up for the CBT group, suggesting that the CBT group might have needed more time to practise the skills in order to reach similar outcomes.

Despite the pleasing outcomes from this study, the results do need to be interpreted with caution due to the small, well-educated sample size. The study needs to be replicated with a greater number of participants with more diverse demographic characteristics. A larger sample will allow further opportunity to investigate mechanisms

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

of change, and to ascertain which of these evidence-supported therapies might work best for whom, and whether the benefits such as those obtained in this study can be sustained over a longer period of time (e.g., 12 months).

References

Arch, J.J., Eifert, G.H., Davies, C., Vilardaga, J.C.P., Rose, R.D., & Craske, M.G. (2012). Randomized clinical trial of cognitive behavioral therapy (CBT) versus acceptance and commitment therapy (ACT) for mixed anxiety disorders. *Journal of Consulting and Clinical Psychology*, *80*(5), 750–765. doi:10.1037/a0028310

Americal Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington DC: Author.

Ballenger, J.C., Davidson, J.R.T., Lecrubier, Y., Nutt, D.J., Borkovec, T.D., Rickels, K., . . . Wittchen, H.-U. (2001). Consensus statement on generalized anxiety disorder from the International Consesus Group on Depression and Anxiety. *Journal of Clinical Psychiatry*, *62*(Suppl. 11), 53–58.

Bond, F.W., & Bunce, D. (2003). The role of acceptance and job control in mental health, job satisfaction, and work performance. *Journal of Applied Psychology*, 88(6), 1057–1067. doi: 10.1037/0021-9010.88.6.1057

Borkovec, T.D., & Ruscio, A.M. (2001). Psychotherapy for generalized anxiety disorder. *Journal of Clinical Psychiatry*, *62*(Suppl.11), 37–42.

Boschen, M.J. (2008). Publication trends in individual anxiety disorders: 1980–2015. *Journal of Anxiety Disorders*, *22*, 570–575. doi:10.1016/j.janxdis.2007.04.004

Brown, T.A., & Barlow, D.H. (1992). Coromobidity among anxiety disorders: implications for treatment and DSM-IV. *Journal of Consulting and Clinical Psychology*, 60, 835–844.

Brown, T.A., Barlow, D.H., & Liebowitz, M.R. (1994). The empirical basis of generalized anxiety disorder. *The American Journal of Psychiatry*, *151*(9), 1272–1280.

Brown, T.A., Di Nardo, P.A., Lehman, C.L., & Campbell, L.A. (2001). Reliability of the DSM-IV anxiety and mood disorders: Implications for the classification of emotional disorders. *Journal of Abnormal Psychology*, *110*(1), 49–58.

Buhr, K., & Dugas, M.J. (2002). The intolerance of uncertainty scale: Psychometric properties of the English version. *Behaviour Research and Therapy*, *40*(8), 931–945. doi:10.1016/S0005-7967(01)00092-4

Covin, R., Ouimet, A.J., Seeds, P.M., & Dozois, D.J.A. (2008). A meta-analysis of CBT for pathological worry among clients with GAD. *Journal of Anxiety Disorders*, *22*(1), 108–116. doi:10.1016/j.janxdis.2007.01.002

Devilly, G.J. (2004). The Effect Size Generator for Windows: Version 2.3 [computer program]. Melbourne, Australia: Centre for Neuropsychology, Swinburne University.

Di Nardo, P.A., Brown, T.A., & Barlow, D.H. (1994). *Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV)*. New York: Graywind.

Eifert, G.H., & Forsyth, J.P. (2005). *Acceptance and commitment therapy for anxiety disorders: A practitioner's treatment guide to using mindfulness, acceptance, and values-based behavior change strategies*. Oakland, CA: New Harbinger Publications.

Erickson, T.M., & Newman, M.G. (2005). Cognitive behavioral psychotherapy for generalized anxiety disorder: A primer. *Expert Review of Neurotherapeutics*, *5*, 247–257.

Forman, E.M., Herbert, J.D., Moitra, E., Yeomans, P.D., & Geller, P.A. (2007). A randomized controlled effectiveness trial of acceptance and commitment therapy and cognitive therapy for anxiety and depression. *Behavior Modification*, *31*(6), 772–799. doi:10.1177/0145445507302202

Forman, E.M., Shaw, J.A., Goetter, E.M., Herbert, J.D., Park, J.A., & Yuen, E.K. (2012). Long-term follow-up of a randomized controlled trial comparing acceptance and commitment therapy and standard cognitive behavior therapy for anxiety and depression. *Behavior Therapy*, *43*(4), 801–811. doi:10.1016/j.beth.2012.04.004

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

Forsyth, J.P., & Eifert, G.H. (2007). *The mindfulness and acceptance workbook for anxiety: A guide to breaking free from anxiety, phobias and worry using acceptance and commitment therapy*. Oakland, CA: New Harbinger Publications.

Frish, M.B. (1994). *Manual and treatment guide for the Quality of Life Inventory*. Minneapolis, MN: Pearson Assessment.

Frish, M.B., Cornwell, J., Villanueva, M., & Retzlaff, P.J. (1992). Clinical validation of the Quality of Life Inventory: A measure of life satisfaction of use in treatment planning and outcome assessment. *Psychological Assessment* 4(1), 92–101.

Glaser, N.M., Blackledge, J.T., Shepherd, L.M., & Deane, F.P. (2009). Brief group ACT for anxiety. In J.T. Blackledge, J. Ciarrochi, & F.P. Deane (Eds.), *Acceptance and commitment therapy: Contemporary theory research and practice* (pp. 175–200). Brisbane, Australia: Australian Academic Press.

Gould, R.A., Safren, S.A., Washington, D.O., & Otto, M.W. (2004). A meta-analytic review of cognitive-behavioral treatments. In R.G. Heimberg, C.A. Turk, & D.S. Mennin (Eds.), *Generalized anxiety disorder: Advances in research and practice* (pp. 248–264). New York: Guilford Press.

Hayes, S.C. (2004). Acceptance and commitment therapy, relational frame theory, and the third wave of behavioral and cognitive therapies. *Behavior Therapy*, *35*(4), 639–665. doi:10.1016/S0005-7894(04)80013-3

Hayes, S.C., Strosahl, S., & Wilson, K. (1999). *Acceptance and commitment therapy: An experiential approach to behavioural change*. New York: Guilford Press.

Hayes, S.C., Strosahl, S., Wilson, K.G., Bissett, R.T., Pistorelo, J., Toarmino, D., ... McCurry, S.M. (2004). Measuring experiential avoidance: A preliminary test of a working model. *The Psychological Record*, *54*(4), 553–578.

Hayes-Skelton, S.A., Roemer, L., & Orsillo, S.M. (2013). A randomized clinical trial comapring an acceptance-based behavior therapy to applied relaxation for generalized anxiety disorder. *Journal of Consulting and Clinical Psychology*, *81*, 761–773. doi:10.1037/a0032871

Herbert, J.D., & Forman, E.M. (2013). Caution: The differences between CT and ACT may be larger (and smaller) than they appear. *Behavior Therapy*, *44*, 218–223. doi:/10.1016/j.beth.2009.09.005

Holowka, D.W., Dugas, M.J., Francis, K., & Laugesen, N. (2000, November). *Measuring beliefs about worry: A psychometric evaluation of the Why Worry-II Questionnaire*. Poster session presented at the annual convention of the Association for Advancement of Behavior Therapy, New Orleans, LA.

Jacobson, N.S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology*, 59(1), 12–19. doi:10.1037/0022-006X.59.1.12

Kazdin, A. (2002). *Research design in clinical psychology* (4th ed). Boston: Allyn & Bacon.

Kessler, R.C., Walters, E.E., & Wittchen, H.U. (2004). Epidemiology. In R.G. Heimberg, C.L. Turk, & D.S. Mennin (Eds.), *Generalized anxiety disorder: Advances in research and practice* (pp. 29–50). New York: Guilford.

Lovibond, S.H., & Lovibond, P.F. (1995). *Manual for the Depression Anxiety Stress Scales* (2nd ed.). Sydney, Australia: Psychology Foundation.

McGrath, K.B., Forman, E.M., del Mar Cabiya, M., Hoffman, K.L., Marques, K., Moitra, E., & Zabell, J.A. (2005, November). *Development and validation of the Drexel University ACT/CBT Therapist Adherence Rating Scale*. Poster presented at the annual meeting of the Association for Behavior and Cognitive Therapies. Washington, DC.

Meyer, T.J., Miller, M.L., Metzger, R.L., & Borkovec, T.D. (1990). Development and validation of the Penn State Worry Questionnaire. *Behaviour Research and Therapy*, *28*(6), 487–495.

Moher, D., Schulz, K.F., & Douglas, A. (2001). The CONSORT statement: Revised recommendations for improving the quality of reports of parallel-group randomised trials. *The Journal of American Medical Association*, *285*(15), 1981–1991. doi:10.1001/jama.285.15.1987

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press

Molina, S., & Borkovec, T.D. (1994). The Penn State Worry Questionnaire: Psychometric properties and associated characteristics. In G. Davey & F. Tallis (Eds.), *Worrying: Perspectives on theory, assessment and treatment* (pp. 265–283). New York: Wiley.

Newman, M.G., Castonguay, L.G., Borkovec, T.D., Fisher, A.J., & Nordberg, S.S. (2008). An open trial of integrative therapy for generalized anxiety disorder. *Psychotherapy: Theory, Research, Practice, Training*, *45*(2), 135–147. doi:10.1037/0033-3204.45.2.135

Öst, L-.G. (2008). Efficacy of the third wave of behavioral therapies: A systematic review and meta-analysis. *Behaviour Research and Therapy*, *46*, 296–321. doi:10.1016/j.brat.2007.12.005

Powers, M.B., Zum Vörde Sive Vörding, M.A., & Emmelkamp, P.M. G. (2009). Acceptance and commitment therapy: A meta-analytic review. *Psychotherapy and Psychosomatics*, *78*(2), 73–80. doi:10.1159/000190790

Roemer, L., & Orsillo, S.M. (2005). An acceptance-based behavior therapy for generalized anxiety disorder. In S.M. Orsillo & L. Roemer (Eds.), *Acceptance and mindfulness based approaches to anxiety: Conceptuallization and treatment* (pp. 213–240). New York: Springer Science and Business Media.

Roemer, L., & Orsillo, S.M. (2007). An open trial of an acceptance-based behavior therapy for generalized anxiety disorder. *Behavior Therapy*, *38*(1), 72–85. doi:10.1016/j.beth.2006.04.004

Roemer, L., Orsillo, S.M., & Salters-Pedneault, K. (2008). Efficacy of an acceptance-based behavior therapy for generalized anxiety disorder: Evaluation in a randomized controlled trial. *Journal of Consulting and Clinical Psychology*, *76*(6), 1083–1089. doi:10.1037/a0012720

Sexton, K.A., & Dugas, M.J. (2008). The Cognitive Avoidance Questionnaire: Validation of the English translation. *Journal of Anxiety Disorders*, *22*(3), 355–370. doi:10.1016/j.janxdis.2007.04.00

Westen, D., & Morrison, K. (2001). A multidimensional meta-analysis of treatment for depression, panic, and generalized anxiety disorder: An empirical exemination of the status of empiricaly supported therapies. *Journal of Consulting and Clinical Psychology*, *69*, 875–899.

Wetherell, J.L., Liu, L., Patterson, T.L., Afari, N., Ayers, C.R., Thorp, S.R., … Petkus, A.J. (2011). Acceptance and commitment therapy for generalized anxiety disorder in older adults: A preliminary report. *Behavior Therapy*, *42*(1), 127–134. doi: 10.1016/j.beth.2010.07.002

Wittchen, H.-U., & Hoyer, J. (2001). Generalized anxiety disorder: Nature and course.*Journal of Clinical Psychiatry*, *62*, 15–19.

Yonkers, K.A., Warshaw, M.G., Massion, A.O., & Keller, M.B. (1996). Phenomenology and course of generalised anxiety disorder. *The British Journal of Psychiatry*, *168*, 308–313.

Zinbarg, R.E., Craske, M.G., Barlow, D.H., & O'Leary, T. (1993). *Mastery of your anxiety and worry, therapist guide*. San Antonio, TX: Psychological Corporation.

https://doi.org/10.1017/bec.2014.5 Published online by Cambridge University Press