An open trial of the feasibility of brief internet-delivered acceptance and aommitment therapy (iACT) for chronic anxiety and depression

Shane P. Cross [a,b,*], Lauren G. Staples [a,b], Madelyne A. Bisby [a,b], Olav Nielssen [a], Alana Fisher [a,b], Nickolai Titov [a,b], Blake F. Dear [a,b]

[a] MindSpot Clinic, Macquarie University, Sydney, NSW 2109, Australia
[b] School of Psychological Sciences, Macquarie University, Sydney, NSW 2109, Australia

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ABSTRACT

Anxiety and depressive disorders are common, often chronic and result in significant disability and distress. The delivery of psychological interventions via the internet is now recognised to be a safe and effective way to treat these disorders. The predominant therapeutic model in clinical trials and in routine care has been cognitive-behavioural therapy (CBT), which helps patients identify and modify unhelpful thoughts and behaviours. However, other models of treatment for anxiety and depression, such as acceptance and commitment therapy (ACT), which uses the examination of both positive and negative experiences in the service of living a personally meaningful and values-based life, have been developed and tested, although most of these interventions are long and require more clinician support to ensure adherence and achieve positive outcomes. The aim of the present study was to examine the feasibility of a new brief, clinician supported transdiagnostic internet-delivered (iACT) program, designed to treat symptoms of both anxiety and depression and improve social function. A single-group open trial was conducted on 24 adults with long-term symptoms of anxiety and depression. The course is comprised of five online modules delivered over 8 weeks either self-guided or with support from a clinician. There was a high course completion rate (70 %) and a high level of satisfaction with the course (94 % satisfied or very satisfied). Significant clinical improvement in our primary outcome measures (within-group Cohen's *d*) of anxiety ($d \geq 0.62$), depression ($d \geq 0.63$), disability ($d \geq 0.43$) and quality of life ($d \geq -0.57$) were observed at posttreatment. Relatively little clinician time was required per participant (M = 30.6 min, SD = 5.7). The findings of the current study support the feasibility and potential of a transdiagnostic iACT treatment for adults experiencing long-term symptoms of anxiety and depression, including those patients who have not derived benefit from other treatments.

1. Introduction

Anxiety and depressive disorders are common in Australian adults, with one in every five people experiencing clinically significant symptoms of anxiety or depression each year (Australian Institute of Health and Welfare, 2019). A range of psychological treatments have been shown to improve symptoms of anxiety and depressive disorders. Cognitive behavioural therapy (CBT) has been subjected to the most research (Hofmann et al., 2012) and has been shown to be effective when delivered face-to-face and remotely via the internet. (Andersson and Titov, 2014; Carlbring et al., 2018; Titov et al., 2017; Titov et al., 2018).

Psychological treatments delivered online have been provided in a

variety of formats, from standalone self-help applications to services that provide a range of combinations of mental health information, assessment and treatment by mental health professionals (Andersson et al., 2019). The outcomes of psychological interventions such as internet-delivered cognitive behavioural therapy (iCBT) have been shown to be equivalent to high quality face-to-face CBT (Carlbring et al., 2018), and iCBT is now delivered as part of routine care in several countries (Titov et al., 2018; Titov et al., 2019; Hadjistavropoulos et al., 2021; Nordgreen et al., 2019; Ruwaard et al., 2012; Johansson et al., 2019; Staples et al., 2021). The success of iCBT has led to interest in using the internet to deliver other models of psychological treatment, such as acceptance and commitment therapy (ACT), psychodynamic and interpersonal therapy, and attention training (Andersson et al., 2019).

The aims and intended mechanisms of change of ACT-based interventions differ from those of CBT-based interventions. ACT aims to increase psychological flexibility by supporting individuals to embrace both positive and negative experiences in the service of living a personally meaningful and values-based life (Hayes et al., 1999). It employs psychological acceptance and mindfulness techniques paired with behavioural change that can be applied to a variety of individual difficulties and disorders (Hayes and Strosahl, 2005). In contrast to CBT, the ACT model emphasizes acceptance, mindfulness, and values-guided behavioural exercises, rather than control (direct reduction) of negative experiences, logical analysis, and cognitive disputation exercises (Hayes et al., 2013). Like CBT, ACT is well suited to being delivered online, given that therapeutic topics can be conveniently broken down to discrete modules (Klimczak et al., 2023).

According to the ACT model, psychological flexibility is attained through the learning and development of six core processes; acceptance, cognitive defusion, being present, self-as-context, values and committed action. Acceptance refers to the embracing of internal experiences without changing their frequency or form. Cognitive defusion involves creating distance from thoughts rather than challenging them or taking them literally. Being present is an ongoing openness to the present moment. Self-as-context involves separating self from context or internal experience to reduce their influence on action. Values are personally meaningful life directions. Committed action is values-guided effective action. These processes are transdiagnostic in the sense that they are effective for both anxiety symptoms and depressed mood (Hayes and Hofmann, 2021).

The efficacy of ACT has been confirmed by numerous randomized controlled trials (RCTs) for a range of psychological symptoms. Gloster et al. (2020) reviewed 20 meta-analyses that reported on the effect sizes achieved in 100 randomized-controlled trials, comparing ACT to waitlist, CBT, active treatments not including CBT, treatment as usual, placebo, or a combination of comparisons, in studies with a total of 12,477 participants. ACT was provided for a range of conditions, including depression, anxiety, substance abuse, chronic pain, as well as for combinations of conditions. Measures included both reported symptoms and outcomes such as quality of life. ACT was shown to be effective for all the conditions examined and was generally superior on average to waitlist ($g = 0.57$), placebo ($g = 0.54$), treatment as usual ($g = 0.46$), interventions other than CBT ($g = 0.57$), and CBT ($g = 0.16$).

A recent systematic review and metanalysis examined 53 RCTs using internet-delivered ACT (iACT) interventions for transdiagnostic problems, most commonly depression and anxiety (Klimczak et al., 2023). Most iACT interventions were delivered via a website ($n = 38$), or an application for a portable device ($n = 10$) or a combination of the two formats ($n = 5$). The interventions had an average of 6.4 modules and took an average of 9.3 weeks to deliver. Fifteen (28 %) were fully automated with no additional support, and the rest involved some form of human support, such as one-way or two-way communication, or online forums. The average attrition rate reported was 42.4 %, and the mean satisfaction rating out of 10 was 7.3. Small but significant differences were found between iACT and waitlist control for anxiety ($g = 0.30$), depression ($g = 0.44$) and quality of life ($g = 0.20$). In contrast, no significant differences were found when iACT was compared to active control groups such as treatment-as-usual, placebo intervention, or online CBT. However, there was significant heterogeneity between studies arising from differences in the delivery platforms, availability of human supports and the duration of treatment.

In summary, there is accumulating evidence that both ACT and iACT are effective in treating a range of conditions, including anxiety and depressive disorders. On average, iACT studies have reported relatively high attrition rates, and varied levels of human support and length of treatment with moderate effects. The current study sought to develop and trial a new iACT intervention that places lower demands on both participants and clinicians compared to most existing iACT interventions. The primary aims of this study were to examine the acceptability, feasibility, and preliminary efficacy of a brief iACT program to treat depression and anxiety, provided with limited clinician support. A second important aim was to obtain feedback from participants to guide revisions and improvements.

2. Methods

2.1. Participants

Participants read about the trial and applied to participate via the eCentreClinic website (www.ecentreclinic.org). The eCentreClinic is a specialist research unit that provides information about common mental health and chronic health conditions and offers free psychological interventions through participation in clinical trials. The ACT Course trial was promoted via Facebook after approval by the Macquarie University Human Research Ethics Committee and registration on the Australian and New Zealand Clinical Trials Registry (ACTRN12622000708752). To be eligible for the study, participants needed to be Australian residents, aged 18 or over, and have primary difficulties with anxiety and/or depression. Participants were excluded if they were imminently suicidal or unable to keep themselves safe, not living in Australia, or unable to read and understand English. Interested participants completed an online screening questionnaire to ensure they met the inclusion and exclusion criteria, which were then subsequently confirmed in a telephone assessment. The brief telephone assessment followed a standard format that included an introduction to the psychologist who will be providing the clinical support, confirmation of consent, interest, availability, and eligibility to participate in the trial, an opportunity to ask any questions related to the trial, and an assessment of safety and risk. A total of 31 people started an online application to participate in the trial, of whom 24 met all inclusion and exclusion criteria and were enrolled in the study. Participant flow is shown in Fig. 1.

Participant characteristics are shown in Table 1. Most participants were female (87.1 %), lived in a capital city (77.4 %) and were employed (71.0 %). Similar numbers of participants were either single (41.9 %) or married/de facto (35.5 %) or had either a trade qualification or diploma (38.7 %) or a university degree (35.5 %). More than half the sample had greater than moderate difficulties with anxiety (67.8 %) and depression (58.1 %). Most reported having symptoms of anxiety or depression for over 6 years (67.7 %), the majority had previously received professional support from a GP (93.5 %) or psychologist (87.1 %), with around two thirds (67.7 %) having obtained professional support from a general practitioner (GP), and half (51.6 %) from psychologist in the past year. Psychotropic medicine prescribed for either depression or anxiety was reportedly used by 32.2 % of the sample.

2.2. Measures

All questionnaires were administered online, and data were self-reported. Pre-treatment demographic measures were administered immediately prior to the start of the course (week 0). All primary and secondary outcome measures were administered online at initial assessment, pre-treatment, and then weekly. The Treatment Satisfaction Questionnaire was used to gauge acceptability and satisfaction with the treatment was administered mid treatment (week 5) and post treatment (week 9). In an attempt to maximise questionnaire completion, up to 3 emails were sent encouraging participants to complete post-treatment questionnaires, and non-responding participants were followed-up with up to 2 telephone calls.

2.2.1. Primary outcomes

2.2.1.1. Patient Health Questionnaire- 9 item. The PHQ-9 is a 9-item measure of symptoms of depression over the past two weeks based on the DSM-IV diagnostic criteria for major depressive disorder. The PHQ-9
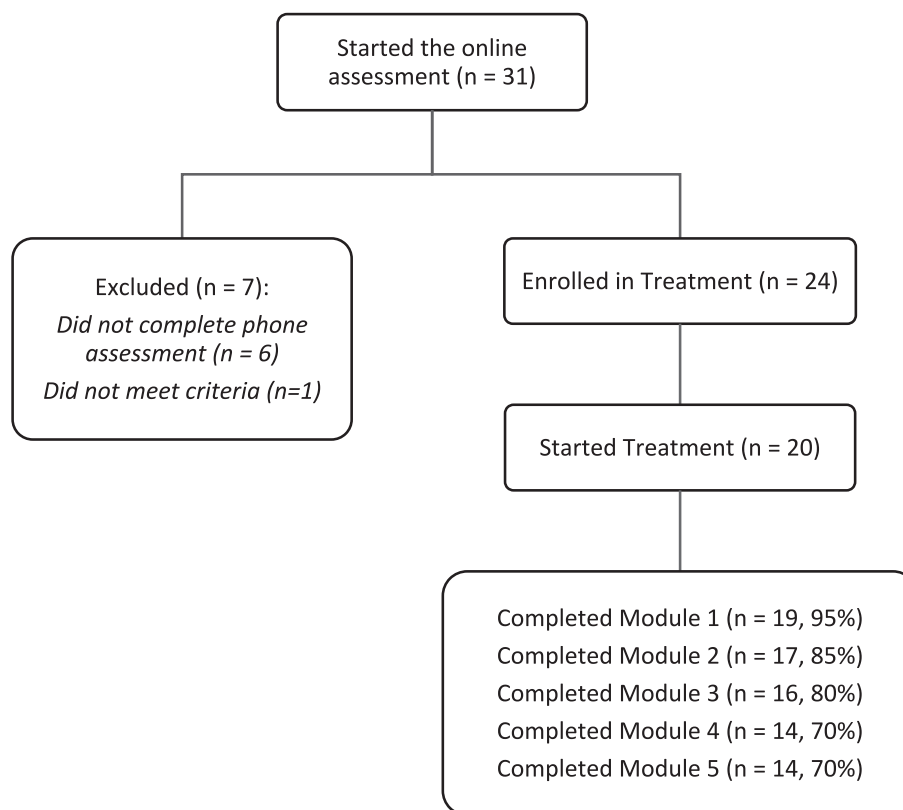
Fig. 1. Participant flow from application to post treatment.

has good internal consistency and is sensitive to change (Kroenke et al., 2001).

2.2.1.2. Generalized Anxiety Disorder 7-Item (GAD-7). The GAD-7 is a 7-item scale measuring the occurrence of general anxiety symptoms over the past two weeks. The GAD-7 is sensitive to DSM-IV-congruent GAD, social phobia, and panic disorder, and has good psychometric properties (Spitzer et al., 2006).

2.2.1.3. World Health Organisation Disability Assessment Schedule 2.0 (WHODAS-2). This is a 12-item measure of functional disability due to a health problem (Üstün et al., 2010).

2.2.2. Secondary outcomes

2.2.2.1. Treatment satisfaction. Treatment satisfaction and acceptability were assessed at post-treatment via 11 questions, which are outlined in Table 3. These questions have been used in numerous previous research trials examining the acceptability of other internet-delivered treatments (Dear et al., 2016).

2.2.2.2. Quality of Life Questionnaire (Burckhardt and Anderson, 2003). This is a 16-item questionnaire measures quality of life in five conceptual domains of quality of life: material and physical well-being, relationships with other people, social, community and civic activities, personal development and fulfillment, and recreation.

2.3. Treatment and procedure

The ACT Course is a new Internet-delivered intervention based on the principles of ACT (Hayes and Strosahl, 2005; Hayes et al., 1999) developed by the primary author (SC), and went through a series of edits with highly experienced clinicians, content developers, and user-

experience consultants who have also developed successful online courses for depression and anxiety. The course is based on a pragmatic model of psychological intervention that aims to: (1) provide information that helps people to understand their symptoms and difficulties; (2) teach simple ACT skills to help participants manage symptoms and difficulties; and (3) reduce the impact of their condition on their day-to-day activities and mental health by the gradual practice and integration of the skills into daily routines. Being based on the principles of trans-diagnostic intervention, the course is designed to provide therapeutic information and teach self-management skills suitable for people with a broad range of conditions. It is notable that there is no tailoring of content or materials for individual participants; all participants receive the same materials. An overview of the structure, content, and skills taught within the Course is provided in Table 2. The Course consists of five online modules and five downloadable PDF's of the modules, as well as several interactive activity sheets. Each module is presented in the form of a slide show, comprising approximately 20 slides containing between 100 and 200 words, taking between 10 and 20 min to read and is designed to be easily read by the average 12-year-old. The modules are presented in a didactic format with a therapeutic tone with illustrations and include realistic examples of skills practice and symptom management throughout, in a format designed to aid learning and the acquisition of skills. Each module begins with a summary of the previous module and ends with a summary of key concepts and skills introduced in the module. Participants are strongly encouraged to practice the recommended skills and to gradually adopt them into their everyday lives. A feature of the course is a single case story weaved through each module to describe how a person with similar difficulties applies the course information and skills to their own situation. Participants were sent regular automated emails throughout the course which summarised the topics covered in the module and encouraged the practice of skills. Some emails were triggered based on participant behaviour, for example, when participants completed a module or when they had not completed a module within 7 days of it becoming available. Emails were

Table 1
Demographic and clinical characteristics of the sample at initial assessment.

	n	%	Mean	SD
Sex (%female)	27	87.1		
Age			39.7	10.5
Relationship status				
Single	13	41.9		
In a relationship	6	19.4		
Married/de facto	11	35.5		
Divorced	1	3.2		
Education				
High school	8	25.8		
Trade or apprenticeship, or diploma	12	38.7		
University degree (undergraduate or postgraduate)	11	35.5		
Location				
Capital city	24	77.4		
Other urban region	3	9.7		
Rural or remote	4	12.9		
Vocational status				
Full-time, part-time, or casual employment	22	71.0		
Unemployed/ seeking employment	5	16.1		
Other	4	12.9		
Symptoms at assessment				
GAD-7			9.8	4.7
PHQ-9			12.2	6.1
WHODAS			15.9	8.5
QoL			59.8	15.2
Current self-reported anxiety				
No	0			
Very mild/mild	10	32.2		
Moderate	13	41.9		
Severe/very severe	8	25.9		
Current self-reported depression				
No	4	12.9		
Very mild/mild	9	29.0		
Moderate	13	41.9		
Severe/very severe	5	16.2		
Symptom duration				
Less than one year	4	12.9		
1–5 years	6	19.4		
6–10 years	5	16.1		
>10 years	16	51.6		
Psychotropic medication use				
For anxiety or depression	10	32.3		
Ever spoken with health professional				
GP	29	93.5		
Psychologist	27	87.1		
Psychiatrist	13	41.9		
Counsellor	19	61.3		
Spoken with health professional in last year				
GP	21	67.7		
Psychologist	16	51.6		
Psychiatrist	5	16.1		
Counsellor	7	22.6		
Any professional	31	100		

GAD7: Generalized Anxiety Disorder 7-Item; PHQ9: Patient Health Questionnaire- 9 item; WHODAS-2: World Health Organisation Disability Assessment Schedule 2.0; QoL: Quality of Life Questionnaire; GP: General Practitioner.

also sent to let participants know when new materials were available and some were sent at set times when participants are known to experience difficulties (e.g., during the early weeks of the course). The emails comprised of 2 to 3 paragraphs containing 3 or 4 concise sentences. Each email used the participant's first name and was written to convey a warm and therapeutic tone.

2.4. Clinician support

The course was offered with optional support of a clinical psychologist (SC), provided by telephone or a secure private messaging system. Participants could leave messages at any time, sometimes prompted by the automated emails, and these were responded to with 24 h. Clinical contact was primarily used to support participants to work through the course and to apply the skills in the context of their symptoms and circumstances. Rather than taking a counselling role, or delving into the participants individual circumstances, the clinician sought to: (i) answer participants' questions; (ii) summarise content; (iii) encourage skills practice and reinforce progress; (iv) enquire about participants' experiences with the course and use of the skills; and (v) normalise challenges in the learning and use of the core skills.

2.5. Analytic plan

All analyses were performed in SPSS version 29. Based on an anticipated from similar iACT trials pre and post effect size of $d = 0.5$, alpha at 0.05 and power of 80 %, a minimum sample size of 15 was required. Generalized estimation equation (GEE) modelling examined changes over time from baseline to post-treatment (Karin et al., 2018; Hubbard et al., 2010). GEE models specified a gamma with log link response scale and an exchangeable working correlation. In checking assumptions, an unstructured working correlation matrix and maximum likelihood estimation were used, and gamma distribution with a log link response scale was specified to address positive skewness in dependent variable distributions. Pairwise comparisons examined the statistical significance of changes between time points. Estimated marginal means were used to calculate percentage change and Cohen's d effect sizes at post-treatment.

Twenty patients started treatment and were eligible for analysis. Post-treatment scores were available for 18/20 patients. For the two patients with missing values at post-treatment, scores were imputed using separate GEE models, adjusted for treatment adherence (Karin et al., 2021).

3. Results

3.1. Treatment acceptability and satisfaction

Of the eighteen participants completing the post-treatment questionnaires, 17 (94 %) reported being 'very satisfied' or 'satisfied' with the course. No participants reported being dissatisfied. Eighteen (100 %) reported that the course was worth their time and 18 (100 %) reported that they would recommend the course to others. Eleven (61 %) reported that the course was sufficient. Nine (50 %) and 9 (50 %) reported at least moderate to very large improvements in their depression and anxiety respectively. Four (22 %) noticed a worsening of their mental health since starting the course, although none reported this to be due to the course when asked. Participants were also asked what they liked and disliked about the course. Seven participants mentioned that the course content was easy to understand (39 %), and 6 mentioned that it was convenient and accessible at any time (33 %). Five (28 %) stated that there was nothing they disliked about the course, and 4 (22 %) mentioned that they would have liked more clinician support.

3.2. Time spent and summary of contacts

Over the eight weeks of the course, the clinical psychologist made an average of 1.9 telephone calls (SD = 0.9) and spent an average of 16.6 mins (SD = 4.8; median = 16) in total per participant. Seven participants requested no phone contact, preferring to use private messaging. The clinical psychologist received an average of 1.4 private messages (SD = 1.5; total = 24), sent an average of 2.1 private messages (SD = 1.1; total = 35), taking an average of 14 mins (SD = 6.6) per participant. Combining time spent in telephone and private message communications, the clinical psychologist spent an average of 30.6 min (SD = 5.7) per participant throughout the course. Participants also received on average 25.8 (SD = 3.7) pre-written, automated email messages throughout the course.

Table 2
Timetable and content of the ACT course.

Module title	Time before next lesson	Lesson content	Primary skill taught/mechanism addressed	Exercises and resources
Module 1: The problem with control	1 week	- Introduction to the ACT model, what to expect and use of metaphors - Normalisation of (Psychological) Pain and our desire to eliminate it - What works and what doesn't - Struggle and the illusion of control - The cost of the struggle - Does control work for you? - Alternatives to control	- Expectations - Identify and undermine the unworkable change agenda - Acceptance and willingness	Within module activity: - Struggle diary PDF - The white elephant PDF Homework: - Daily struggle diary PDF Reference Metaphors: - The Train Station PDF - Tug of War with a Monster PDF - Quicksand PDF - Feeding the Tiger PDF - The unwanted party guest PDF - Two Dials PDF
Module 2: Your values, goals, and actions	1 week	- Review previous module, and difficulty of 'dropping the rope'. - Reflect on homework learnings - What are values and why they matter - Values vs. goals vs. actions - Values assessment - Committed value-based actions and tips	- Identifying self-determined values - Values-based behavioural activation.	Within module activity: - Values Assessment PDF Homework: - Small Actions PDF Reference Metaphors: - Passengers on the Bus PDF - Train Station PDF - Feeding the Tiger PDF
Module 3: The trouble with thoughts	2 weeks	- Review previous module, normalise difficulty of change - Reflect on homework learnings - What are thoughts: invisible, powerful, labelled - Thoughts and the evolution of the mind - 'You are not your thoughts' - The buzz of mental activity - Identifying the passengers on your bus - Introducing 'thought distancing'.	- Cognitive defusion - Acceptance - Healthy distancing and non-judgemental awareness - Linking to values-based behavioural activation.	Within module activity: - Mind Chess PDF - Passengers on my Bus PDF - Leaves on a Stream AUDIO Homework: - Thought Distancing Techniques PDF - Leaves on a Stream Exercise PDF - Small Actions PDF
Module 4: Mind your mind		- Review of previous module, normalisation of difficulty in separating self from thoughts - Reflect on homework learnings - Being present by just noticing - Autopilot - Mindfulness as the opposite of autopilot (mindlessness) - Myths of mindfulness - Your mind is a puppy - The Mindful Bus Driver	- Mindfulness - Linking to values-based behavioural activation.	Within module activity: - Just Noticing Exercise - Just Noticing AUDIO Homework: - Read or listen to Mindfulness Exercises (PDF and AUDIO) - Tune into your breath - Mindfulness of breath - Mindfully eat a sultana - Mindful chores - Leaves on a stream - Small Actions PDF
Module 5: ACT for Life		- Review previous module, encourage ongoing gentle practice despite difficulty - Reflect on homework learnings - Putting it all together - Moving from FEAR to ACT - Assess progress fairly (The Mountain) - Values Review and progress made - New commitments - Dealing with setbacks - 'Control the controllables'. - Do what (really) works	- Relapse prevention - Progress monitoring	Within module activity: - The Mountain PDF - Values Review PDF

3.3. Primary and secondary outcomes

The GEE analyses revealed an overall time effect for anxiety (GAD-7; Wald's $\chi 2$ = 14.655, p = .002), depression (PHQ-9; Wald's $\chi 2$ = 12.392, p < .006); disability (WHODAS; Wald's $\chi 2$ = 15.388, p = .002), and quality of life (QoL; Wald's $\chi 2$ = 11.248, p = .010). Pairwise comparisons revealed that on all measures, scores were lower at post-treatment compared to assessment (PHQ-9, GAD-7, and QoL: p < .01; WHODAS: p

Table 3
Results from the Treatment Satisfaction Questionnaire (TSQ).

Question	Mid-treatment	Post-treatment
How satisfied are you with the treatment you received (very satisfied/satisfied)?	12/14 (86 %)	17/18 (94 %)
Would you feel confident recommending the course to others?	14/14 (100 %)	18/18 (100 %)
Was the course worth your time?	14/14 (100 %)	18/18 (100 %)
Was the course sufficient to address your difficulties with anxiety and/or depression?	6/14 (43 %)	11/18 (61 %)
Have you noticed improvements in your anxiety as a result of the course (moderate to large improvements)?	6/14 (43 %)	9/18 (50 %)
Have you noticed improvements in your depression as a result of the course (moderate to large improvements)?	7/14 (50 %)	9/18 (50 %)
Have you noticed a worsening of your mental health since starting the course?	2/14 (14 %)	4/18 (22 %)
If yes, in your opinion, was the course responsible for this worsening?	–	0/4 (0 %)
Free text responses		
What did you LIKE about the treatment you received?		
Course content – easy to understand	–	7/18 (39 %)
Convenient and accessible at any time	–	6/18 (33 %)
Examples, worksheets and exercises	–	5/18 (28 %)
Pacing of the course	–	5/18 (28 %)
Psychologist emails and support	–	4/18 (22 %)
No cost	–	2/18 (11 %)
What did you NOT like about the treatment you received?		
No dislikes reported	–	5/18 (28 %)
Prefer more clinician support	–	4/18 (22 %)
Disliked pacing of the course	–	3/18 (17 %)
Disliked online format	–	3/18 (17 %)
Disliked a part of the content or examples	–	2/18 (11 %)

< .001) (Table 4).

4. Discussion

This study tested the feasibility and potential efficacy of a new transdiagnostic iACT course designed for people with depression and anxiety. The results were encouraging, with high treatment completion rates, most participants experienced improvements in symptoms of anxiety and depression, and nearly all participants reported the course to be acceptable and helpful.

The completion rate of 70 % was higher than the average completion rates reported in metanalyses for iACT (57.7 %, (Klimczak et al., 2023)) and iCBT (61.3 %, (Etzelmueller et al., 2020)), although participants may have been motivated by their participation in a clinical trial, and the effect of email and telephone follow up. Although the sample was relatively small, clinically significant improvement was observed in

symptoms of anxiety ($ds \geq 0.62$; avg. improvement ≥ 29 %), and depression ($ds \geq 0.63$; avg. improvement ≥ 29 %), and in measures of disability ($ds \geq 0.43$; avg. improvement ≥ 25 %), and quality of life ($ds \geq -0.57$; avg. improvement ≥ 9 %). Detailed comparison of outcomes with previous studies is not possible because of differences in sample characteristics, modes of delivery, outcome measures and above all the testing of a novel ACT Course. However, the initial findings were encouraging, given the chronic nature of the participants symptoms, and their previous exposure to other treatments, and compare favourably with the outcomes of trials of other forms of iACT and also iCBT.

Although the course did not advertise for participants with long term or chronic depression and/or anxiety, two thirds (67.7 %) of the sample reported >6 years of depression or anxiety symptoms, and half (51.6 %) reported symptoms of >10 years in duration, and all the participants reported previous treatment. ACT is a model of therapy that may be well suited to people with chronic forms of depression and anxiety. ACT encourages participants to focus on actions that are in the service of values rather than attempting to challenge negative thoughts and feelings (Hayes et al., 1999; Hayes and Strosahl, 2005), which some people are unable to do. The finding that a sample of participants with chronic symptoms, despite experience of treatment, reported improvements in measures of disability and quality of life, highlighting a potential link between the focus on valued action encouraged by the course, and the attitude to symptoms and to day-to-day demands. Given that iCBT has an estimated non-response rate of 25 % according to a recent meta-analysis (Rozental et al., 2019), alternative interventions such as iACT may prove to be a useful alternative.

The improvement in measures of symptoms of anxiety and depression, despite the course materials being more focussed on broad ACT principles rather than directly addressing symptoms, was interesting. Those conditions were only mentioned in the entire course material 9 and 11 times respectively. Instead, the terminology of the course addressed a wider set of human emotional and cognitive challenges, which in turn may have allowed participants to apply the materials in a more general way to situations that arose, for example, to interpersonal difficulties. Future studies applying the ACT Course to a wider range of problems and diagnoses are warranted.

Despite the comparative brevity of the course material, and the concise and accessible way the key concepts were presented, the trial produced some encouraging results. This approach might help broaden the appeal of the ACT Course and might explain the higher completion rate. The delivery of the course required relatively little clinician time, which would allow it to be provided to a greater number of participants. The average clinician time of 30.6 min (SD = 5.7) for both phone calls and private messages over the entire 8 weeks, was in part because some participants elected to have no contact, and because all participants were oriented to the anticipated nature of clinician support. By comparison iCBT requires far more clinician time, based on the pooled mean clinician guidance time reported in a large metanalysis of iCBT for depression and anxiety of 148.5 min (SD 147.0) (Etzelmueller et al.,

Table 4
Means, standard deviations, Cohen's d effect sizes and percentage changes for the primary and secondary measures at each of the measurement timepoints.

	Assessment	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Post-treatment[a]	Effect sizes	Percent change
GAD-7	10.0	11.2	9.6	8.0	9.6	9.0	7.9	7.4	7.1	0.62	28.7
	(3.9)	(5.1)	(4.8)	(4.3)	(5.1)	(5.7)	(5.5)	(3.9)	(5.4)	[−0.03–1.24]	[−1.3–49.8]
PHQ-9	12.1	12.4	11.1	10.0	9.6	9.1	8.7	7.7	8.5	0.63	29.4
	(5.1)	(5.6)	(5.9)	(5.4)	(6.7)	(5.8)	(6.1)	(5.4)	(6.3)	[−0.02–1.25]	[2.2–49.0]
WHODAS	15.1	14.9	14.0	8.9	14.3	14.2	12.5	14.7	11.3	0.43	25.1
	(8.0)	(10.0)	(10.3)	(7.6)	(10.1)	(10.9)	(11.0)	(7.5)	(9.5)	[−0.20–1.05]	[−8.1–48.1]
QoL	61.4	61.8	63.2	65.5	59.8	62.3	64.9	61.0	69.8	−0.57	−8.8
	(11.7)	(15.5)	(15.5)	(17.7)	(16.6)	(17.2)	(17.3)	(12.3)	(17.3)	[−1.19–0.07]	[−21.3–2.4]

Standard deviations are shown in parentheses for the means and 95 % confidence intervals are shown in parentheses for effect size and percentage change statistics.
GAD7: Generalized Anxiety Disorder 7-Item; PHQ9: Patient Health Questionnaire- 9 item; WHODAS-2: World Health Organisation Disability Assessment Schedule 2.0; QoL: Quality of Life Questionnaire.
[a] Post treatment estimated mean shown, adjusting for missing data ($n = 2$) post treatment.

2020). If confirmed, the lower clinician support time raises the possibility of delivering the course at greater scale with fewer resources. However, some participants (22 % of those providing feedback) said that they would have liked more clinician support time, even though communication with the clinician was encouraged and telephone contact was available at weekly intervals.

The trial has several significant limitations. Firstly, the lack of a control group prevents any comparison with natural recovery. It also limits comparison with other established treatments or active controls. Secondly, the study recruited a treatment-seeking sample, all of whom had some experience of psychological treatments, which may not be typical of other clinical samples. Thirdly, the sample size was relatively small and was mainly of females residing in urban areas. Fourthly, standardised diagnostic interviews were not conducted to verify diagnoses of anxiety or depression. Despite this, the combination of self-report treatment and standardised psychometric measures provides evidence for caseness. Lastly, we did not include a measure of psychological flexibility to reduce questionnaire burden. Future studies should include this measure to determine its role as a mediating mechanism.

Despite its limitations, the current study is to our knowledge the first to examine the potential of a novel and relatively brief iACT intervention for adults with chronic depression and anxiety. The preliminary findings were encouraging and provided support for a larger scale trial of this intervention.

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Declaration of competing interest

S. Cross is the developer of the ACT Course, but derives no personal or financial benefit from it. All other authors declare they have no competing interests.

References

Andersson, G., Titov, N., 2014. Advantages and limitations of internet-based interventions for common mental disorders. World Psychiatry 13 (1), 4–11.

Andersson, G., Titov, N., Dear, B.F., et al., 2019. Internet-delivered psychological treatments: from innovation to implementation. World Psychiatry 18 (1), 20–28.

Australian Institute of Health and Welfare, 2019. Mental Health Services in Australia: In Brief 2019. Reportno. Report Number|, Date. Place Published|: Institution.

Burckhardt, C.S., Anderson, K.L., 2003. The Quality of Life Scale (QOLS): reliability, validity, and utilization. Health Qual. Life Outcomes 1 (1), 1–7.

Carlbring, P., Andersson, G., Cuijpers, P., et al., 2018. Internet-based vs. face-to-face cognitive behavior therapy for psychiatric and somatic disorders: an updated systematic review and meta-analysis. Cogn. Behav. Ther. 47 (1), 1–18.

Dear, B., Staples, L., Terides, M., et al., 2016. Transdiagnostic versus disorder-specific and clinician-guided versus self-guided internet-delivered treatment for social anxiety disorder and comorbid disorders: a randomized controlled trial. J. Anxiety Disord. 42, 30–44.

Etzelmueller, A., Vis, C., Karyotaki, E., et al., 2020. Effects of internet-based cognitive behavioral therapy in routine care for adults in treatment for depression and anxiety: systematic review and meta-analysis. J. Med. Internet Res. 22 (8), e18100.

Gloster, A.T., Walder, N., Levin, M.E., et al., 2020. The empirical status of acceptance and commitment therapy: a review of meta-analyses. J. Contextual Behav. Sci. 18, 181–192.

Hadjistavropoulos, H.D., Peynenburg, V., Thiessen, D.L., et al., 2021. Utilization, patient characteristics, and longitudinal improvements among patients from a provincially funded transdiagnostic internet-delivered cognitive behavioural therapy program: observational study of trends over 6 years: utilisation, caractéristiques des patients et améliorations longitudinales chez les patients d'un programme de thérapie cognitivo-comportementale financé par la province, transdiagnostique et dispensé par internet: Une étude observationnelle des tendances sur six ans. Can. J. Psychiatr. https://doi.org/10.1177/07067437211006873 (Epub ahead of print 2021/04/13, 7067437211006873).

Hayes, S.C., Hofmann, S.G., 2021. "Third-wave" cognitive and behavioral therapies and the emergence of a process-based approach to intervention in psychiatry. World Psychiatry 20 (3), 363–375.

Hayes, S.C., Strosahl, K.D., 2005. A Practical Guide to Acceptance and Commitment Therapy. Springer Science+ Business Media.

Hayes, S.C., Strosahl, K.D., Wilson, K.G., 1999. Acceptance and Commitment Therapy: An Experiential Approach to Behavior Change. The Guilford Press, New York.

Hayes, S.C., Levin, M.E., Plumb-Vilardaga, J., et al., 2013. Acceptance and commitment therapy and contextual behavioral science: examining the progress of a distinctive model of behavioral and cognitive therapy. Behav. Ther. 44 (2), 180–198.

Hofmann, S.G., Asnaani, A., Vonk, I.J.J., et al., 2012. The efficacy of cognitive behavioral therapy: a review of meta-analyses. Cogn. Ther. Res. 36 (5), 427–440.

Hubbard, A.E., Ahern, J., Fleischer, N.L., et al., 2010. To GEE or not to GEE: comparing population average and mixed models for estimating the associations between neighborhood risk factors and health. Epidemiology 467–474.

Johansson, O., Bjärehed, J., Andersson, G., et al., 2019. Effectiveness of guided internet-delivered cognitive behavior therapy for depression in routine psychiatry: a randomized controlled trial. Internet Interv. 17, 100247.

Karin, E., Dear, B.F., Heller, G.Z., et al., 2018. Measurement of symptom change following web-based psychotherapy: statistical characteristics and analytical methods for measuring and interpreting change. JMIR Ment. Health 5 (3), e10200.

Karin, E., Crane, M.F., Dear, B.F., et al., 2021. Predictors, outcomes, and statistical solutions of missing cases in web-based psychotherapy: methodological replication and elaboration study. JMIR Ment. Health 8 (2), e22700.

Klimczak, K.S., San Miguel, G.G., Mukasa, M.N., et al., 2023. A systematic review and meta-analysis of self-guided online acceptance and commitment therapy as a transdiagnostic self-help intervention. Cogn. Behav. Ther. https://doi.org/10.1080/16506073.2023.2178498. 1-26.

Kroenke, K., Spitzer, R.L., Williams, J.B., 2001. The PHQ-9: validity of a brief depression severity measure. J. Gen. Intern. Med. 16 (9), 606–613.

Nordgreen, T., Blom, K., Andersson, G., et al., 2019. Effectiveness of guided internet-delivered treatment for major depression in routine mental healthcare - an open study. Internet Interv. 18, 100274.

Rozental, A., Andersson, G., Carlbring, P., 2019. In the absence of effects: an individual patient data meta-analysis of non-response and its predictors in internet-based cognitive behavioral therapy. Front. Psychol. 10, 589.

Ruwaard, J., Lange, A., Schrieken, B., et al., 2012. The effectiveness of online cognitive behavioral treatment in routine clinical practice. PLoS One 7 (7), e40089.

Spitzer, R.L., Kroenke, K., Williams, J.B., et al., 2006. A brief measure for assessing generalized anxiety disorder: the GAD-7. Arch. Intern. Med. 166 (10), 1092–1097.

Staples, L., Nielssen, O., Kayrouz, R., et al., 2021. Rapid report 3: mental health symptoms, characteristics, and regional variation, for users of an Australian digital mental health service during the first 8 months of COVID-19. Internet Interv. 24, 100378.

Titov, N., Dear, B.F., Staples, L.G., et al., 2017. The first 30 months of the MindSpot clinic: evaluation of a national e-mental health service against project objectives. Aust. N. Z. J. Psychiatry 51 (12), 1227–1239.

Titov, N., Dear, B., Nielssen, O., et al., 2018. ICBT in routine care: a descriptive analysis of successful clinics in five countries. Internet Interv. 13, 108–115.

Titov, N., Hadjistavropoulos, H.D., Nielssen, O., et al., 2019. From research to practice: ten lessons in delivering digital mental health services. J. Clin. Med. 8 (8), 1239.

Üstün, T.B., Chatterji, S., Kostanjsek, N., et al., 2010. Developing the World Health Organization disability assessment schedule 2.0. Bull. World Health Organ. 88 (11), 815–823.