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# ACTing towards better living during COVID-19: The effects of Acceptance and Commitment therapy for individuals affected by COVID-19

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## ABSTRACT

The widespread effects of COVID-19 have dramatically increased the prevalence of mental health difficulties, meaning it is vital to explore psychotherapy options. Acceptance and Commitment therapy (ACT) helps individuals engage in meaningful activities despite difficult and unchangeable circumstances. Recent literature suggests that psychological flexibility, the underlying process of ACT, may moderate COVID-related distress – making ACT a promising psychotherapy candidate. This study therefore aimed to explore the effects of an ACT-based, guided self-help intervention on wellbeing, psychological flexibility, COVID-related distress, and general psychological distress within the general population. 48 participants (recruited via social media) engaged in a three-week, non-concurrent baseline phase, then received six, weekly, digital modules and weekly webinars to address module queries. 20 participants completed all modules and provided post-intervention feedback via an online qualitative survey. Multilevel modelling analysis found significant improvements in: wellbeing; overall psychological flexibility (including subscales behavioural awareness and valued action); and general psychological distress (including depression, anxiety and stress). No significant changes were found for COVID-related distress. Findings were sustained at one- and two-months follow-up – suggesting lasting change. Qualitative findings provide further insights about the experience of the intervention: participants reported improved wellbeing, still experiencing COVID-related distress, but felt more able to cope with general psychological distress (such as anxiety). No change in COVID-related distress scores may be due to methodological and measurement issues. This study is one of the first to explore ACT as a psychotherapeutic intervention for COVID-related distress and adds to the growing body of literature highlighting psychological flexibility as a key process for mitigating COVID-related distress.

## 1. Introduction

Despite the recency of the COVID-19 pandemic, preliminary literature is already revealing a clear heterogenic, yet ubiquitous, psychological impact. During the 2002–2003 SARS epidemic (also caused by a coronavirus), patients and healthcare professionals (HCPs) working directly with the virus had increased rates of mental health difficulties (Mak et al., 2009; Reynolds et al., 2008). The COVID-19 pandemic is revealing similar findings, yet of an unprecedented magnitude. Half of HCPs and up to 90% of patients affected by COVID-19 have reported high rates of anxiety, depression, post-traumatic stress disorder, and other mental health issues (Bo et al., 2020; Lai et al., 2020). Furthermore, unlike the SARS epidemic, global reports note considerable increases in psychological distress throughout the general population; not just those directly affected by the virus (Alhalafi, 2020; Chong et al.,

2021; Ettman et al., 2020; Gloster, Lamnisos, et al., 2020; Rossi et al., 2020; Wang et al., 2020). In a recent large-scale UK survey, over half of respondents met criteria for common mental health conditions (Pieh et al., 2020). This compares to a lifetime prevalence of around 25% pre-pandemic (Davis et al., 2020). This suggests distress related to COVID-19 affects more than just those directly working with or suffering from the virus and may be pervasive throughout the population.

Two recent analyses found increases in distress may partly stem from fears directly related to COVID-19, such as fears of infection and the health implications of this (Brooks et al., 2020; Douglas et al., 2020; Neto et al., 2021). It is increasingly clear, however, that COVID-19 is also fostering distress via indirect routes (see Brooks et al., 2020, and Douglas et al., 2020, for further discussion). Lockdown and quarantining measures have reduced access to support networks, increased social isolation, and disrupted daily routines – each of which act as buffers

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against developing mental health difficulties following stressful events (Burton et al., 2015). Transmission-mitigation efforts have resulted in economic uncertainty for many individuals – the links between this uncertainty and mental health difficulties are well established (Benzeval et al., 2014; Paul & Moser, 2009). COVID-19-related factors also appear to be limiting those with pre-existing mental health issues from accessing support, worsening difficulties. In the UK, routine mental health appointment attendance has reduced by approximately 40%, while urgent and emergency mental health cases have increased by 40% (Royal College of Psychiatrists, 2020). Less than half of individuals exhibiting self-harm received support over the initial lockdown period (Job et al., 2020). Opportunities for harm mitigation (such as escaping an unsafe home environment) have been limited and domestic abuse helplines have seen a proliferation in calls (Bradbury-Jones & Isham, 2020). Finally, the extended and uncertain nature of COVID-19-related difficulties have acted as a catalyst, creating rumination and worsening the overall effects (Brooks et al., 2020). Dubbed a ‘pandemic within a pandemic’ (Karim, 2020), these direct and indirect factors have resulted in heterogenic, yet ubiquitous, ‘COVID-related distress’ (an unprecedented increase in mental health difficulties linked to COVID-19). Whilst early literature suggested psychotherapy should target individuals recovering from COVID-19 and HCPs (Xiang et al., 2020; Zheng, 2020), it is now clear that COVID-related distress is not limited to these groups. There is, therefore, a need to investigate intervention options to prepare for the burgeoning pressure COVID-related distress will place on mental health services. Critically, we need to identify malleable psychological processes that can help to promote wellbeing and psychological health, even in the pandemic context.

### 1.1. Psychological flexibility and acceptance and Commitment Therapy

COVID-related distress appears multifaceted, yet psychological flexibility may be one common underlying process. Psychological flexibility is the ability to adapt and change behaviour to pursue personally meaningful (typically long-term) outcomes (Hayes et al., 2012). Higher psychological flexibility has been linked to improved wellbeing and mental health outcomes following stressful events (such as bereavement, unemployment, or serious illness; Fonseca et al., 2020; Francis et al., 2016; Gloster et al., 2017), while lower psychological flexibility is well-documented to be associated with poorer coping and increased psychopathology (Kashdan et al., 2006; Levin et al., 2014; Woodruff et al., 2014). In relation to COVID-19, psychological flexibility has been found to be a mitigating factor against the development of COVID-19 related mental health difficulties (McCracken et al., 2021), whilst increasingly, literature from across multiple populations demonstrates that psychological flexibility predicts ability to cope with COVID-related distress over and above previously identified coping-factors (Dawson & Golijani-Moghaddam, 2020; Gloster, Lamnisos, et al., 2020; Pakenham et al., 2020). These studies highlight psychological flexibility as a potentially trainable target for intervention to alleviate or prevent COVID-related distress. Gloster, Lamnisos, et al. (2020) note the suitability of psychological flexibility interventions to be widely distributed via digital means to reach a broad audience. This creates a compelling argument for exploring psychological flexibility as a target for easing COVID-related distress.

Psychological flexibility is the underlying mechanism targeted in Acceptance and Commitment Therapy (ACT; Harris, 2019; Hayes et al., 2012), and recent literature is pointing towards ACT as a possible intervention to address COVID-related distress (Gloster, Lamnisos, et al., 2020; Kroska et al., 2020). A psychotherapy grounded in third-wave Cognitive Behavioural Therapy (CBT) principles, ACT seeks to increase psychological flexibility, and thus wellbeing, by targeting the six psychological flexibility core processes. These are summarised into three interconnected dyads (defined in Table 1): openness to experiences (OE); behavioural awareness (BA); and valued action (VA).

ACT posits that psychological pain is a healthy and inevitable

**Table 1**

Dyadic definitions of psychological flexibility core processes (Francis et al., 2016; Hayes et al., 2012).

Dyadic process	Description	Sub-processes
Openness to experience (OE)	Openness to experience and detachment from literality	<ul style="list-style-type: none"> <li>• Acceptance</li> <li>• Defusion</li> </ul>
Behavioural awareness (BA)	Self-awareness and perspective taking	<ul style="list-style-type: none"> <li>• Contact with present moment</li> <li>• Self-as-context</li> </ul>
Valued Action (VA)	Motivation and activation	<ul style="list-style-type: none"> <li>• Values</li> <li>• Committed action</li> </ul>

response to difficult situations (Harris, 2006; Hayes et al., 2012). Mental ill-health is thought to arise from excessive attempts to avoid or control this pain, resulting in rigid and inflexible behaviour which disrupts personally meaningful activities. ACT aims to help individuals live alongside psychological pain, regardless of the manifestation of the distress, to improve overall wellbeing. ACT seems apt to address the heterogeneity of COVID-related distress: through focussing on core adaptive processes underpinning psychological health and resilience. Conceptually, the promotion of flexibility within ACT also fits well with the uncertain and constantly changing current climate.

### 1.2. Guided self-help therapy

The considerable increase in mental-ill health triggered by COVID-19 hints towards a burgeoning pressure on mental health services (Riedel-Heller & Richter, 2020). This highlights the need for an accessible psychotherapy that is effectively and efficiently accessible to the potentially large population of individuals suffering with COVID-related distress. Furthermore, lockdown and quarantining measures have resulted in considerable limitations to face-to-face working, motivating the use of virtual or distanced psychotherapy.

Guided self-help, whereby individuals receive work to complete independently with regular therapist support, is one such option (Anderson et al., 2005). Self-help allows individuals to access psychotherapy at a time and place comfortable for themselves. Guided self-help is currently used throughout UK mental health services and is empirically supported to be as effective as face-to-face therapy when delivered online (Andersson et al., 2014; van't Hof et al., 2009). A meta-analysis reviewing thirteen studies established that ACT guided self-help may help to ease the distress of depression and anxiety, with increased clinician support improving outcomes (French et al., 2017). Usage of video conferencing has become more prevalent as individuals switch to virtual social-gatherings and evidence both prior to the pandemic and more recently suggests this may be a viable medium to provide support in the absence of face-to-face meetings (Karyotaki et al., 2018; Viswanathan et al., 2020). This medium also enables larger numbers of individuals to access support by hosting online seminars (or ‘webinars’) guiding individuals on how to use the content. This format could provide a mechanism for potentially large numbers of individuals suffering with COVID-related distress to efficiently access support.

#### Study aims.

The primary aim of the present study was therefore to examine the effects of a guided self-help ACT intervention on wellbeing for individuals in the general population experiencing COVID-related distress. Secondary aims included exploring the effects of the intervention on psychological flexibility, COVID-related distress, and general psychological distress (including depression, stress, and anxiety) in this population, and if any changes were present at one- and two-months follow-up.

## 2. Methods

A mixed-methods, AB, interventional, time-series design was used to meet the aims of the study. Three groups engaged in a three-week

baseline phase, with stratified start-dates to establish a non-concurrent baseline, followed by a six-week intervention phase, post-intervention measures, and two follow-up periods at one- and two-months post-intervention. Ethical approval was granted by the Human Ethics Committee, [location of committee and reference code removed for masked review].

### 3. Participants

Advertisements were posted on social media (Facebook, Twitter, Instagram) and UK-specific forums (Reddit), specifically seeking “individuals struggling to cope with stresses caused by COVID-19” to engage in an online, self-help, psychotherapy, research study, utilising snowball sampling – where individuals were asked to ‘share’ the advertisement with others in their network. Recruitment was open for a two-week period. Potential participants completed an online sign-up form via an advertisement link. If they met the inclusion criteria (below), based on their self-report responses to each criterion, they self-selected a webinar day/time slot which determined participant group.

Inclusion criteria were purposefully kept broad due to the ubiquitous nature of COVID-related distress:

- Current residency in the UK,
- 18 years old or over,
- Currently distressed (determined by a WEMWBS score of below 47, see measures section below; Tennant et al., 2007).

#### 3.1. Measures

Demographic information was obtained at sign-up. Participants

completed three measures exploring nine outcome variables, either weekly or at key timepoints (dependant on measure; see Table 2 for the measures schedule).

To explore the additional outcome variable ‘COVID-related distress’, participants were asked, “Over the past week, how have you felt about the COVID-19 situation?” on a Likert-scale of 0 (“I have been feeling OK about it”) to 10 (“I have been extremely distressed by it”). Language was purposefully broad to capture participants’ overall experiences. This question was asked within weekly measures at: pre-intervention; baseline; intervention (weekly throughout); intervention mid-point; post-intervention; one- and two-month follow-up.

Participants completed all measures/questions online via the surveying platform Qualtrics (Qualtrics, Provo, UT, USA) and short-form measures were used to reduce participant burden.

#### 3.2. Post-intervention survey

Participants provided feedback post-intervention via an anonymous, open-answer, online survey, based on guidance for change interviews by Elliott (2006). Questions focused on intervention-experience, positive and/or negative changes, helpful and unhelpful aspects of the intervention, and non-interventional events that might have affected outcomes (e.g., “Did anything happen in your life or were there any changes throughout the therapy that you feel were not to do with the therapy (such as a change in life circumstances)?”).

#### 3.3. Modules and webinars

During the intervention stage, participants received (weekly) online, semi-interactive, self-help modules. Modules were adapted from chapters of the ACT self-help book ‘Get Out of Your Mind and Into Your Life’

**Table 2**  
Descriptions, delivery schedules, and psychometric properties of the measures included in the study.

Measure	Variable	Scoring details	Measures schedule	Psychometric properties
SWEMWBS	Primary outcome: Wellbeing	7-item, 5-point Likert scale. Higher scores indicate increased psychological wellbeing.	<ul style="list-style-type: none"> <li>• Pre-intervention</li> <li>• Baseline</li> <li>• Intervention (weekly throughout)</li> <li>• Intervention mid-point</li> <li>• Post-intervention</li> <li>• One-month follow-up</li> <li>• Two-month follow-up</li> </ul>	High published internal reliability ( $\alpha = 0.84$ ) and correlates highly with both related measures and WEMWBS (Ng Fat et al., 2017; Stewart-Brown et al., 2009), however published test-retest reliability data is unavailable. Internal reliability for the present study was calculated to also be high ( $\alpha = 0.86$ measured weekly; $\alpha = 0.87$ measured per phase <sup>1</sup> ).
CompACT-8	Process variable: Psychological flexibility (total score) <ul style="list-style-type: none"> <li>• OE</li> <li>• BA</li> <li>• VA</li> </ul>	8-item, 6-point Likert scale. Higher scores indicate higher psychological flexibility.	<ul style="list-style-type: none"> <li>• Pre-intervention</li> <li>• Baseline</li> <li>• Intervention (weekly throughout)</li> <li>• Intervention mid-point</li> <li>• Post-intervention</li> <li>• One-month follow-up</li> <li>• Two-month follow-up</li> </ul>	High published internal reliability ( $\alpha > 0.70$ ) and correlates significantly with similar measures of ACT processes (Morris, 2019). Internal reliability for the present study was calculated to also be high ( $\alpha = 0.70$ measured weekly; $\alpha = 0.77$ measured per phase <sup>1</sup> ).
DASS-21	Secondary outcome: General psychological distress (total score) <ul style="list-style-type: none"> <li>• Depression</li> <li>• Anxiety</li> <li>• Stress</li> </ul>	21-item, 4-point Likert scale. Higher scores indicate increased distress within the measured construct.	<ul style="list-style-type: none"> <li>• Pre-intervention,</li> <li>• Intervention mid-point,</li> <li>• Post-intervention,</li> <li>• One-month follow-up,</li> <li>• Two-month follow-up.</li> </ul>	High published internal reliability (positive ( $\alpha = 0.87$ to $0.94$ across the three subscales) and the measure correlates highly with similar measures (Antony et al., 1998). Internal reliability for the present study was calculated to also be high ( $\alpha = 0.92$ overall; $\alpha = 0.81$ to $0.90$ across the three subscales; measured per phase <sup>1</sup> ).

Note. SWEMWBS: Warwick-Edinburgh Mental Wellbeing short form (Stewart-Brown et al., 2009); CompACT-8: Comprehensive Assessment of Acceptance and Commitment Therapy (Morris, 2019); DASS-21: Depression, Anxiety, and Stress Scale-21 (Lovibond & Lovibond, 1995). <sup>1</sup>Measured ‘per phase’ refers to timepoints: pre-, mid- and post-intervention, and one- and two-month follow-up points.

(Hayes & Smith, 2005). Chapters were digitised, condensed, and clarified following the findings of previous research using this book (Davies, 2018) and augmented with process-aligned videos (see Table 3 for a summary of content). Participants could interact with modules by entering their own text to create personalised worked examples of activities. Modules also included ‘question sections’ in which participants could raise queries about module content to be addressed during the weekly webinar by the facilitator. Each module focused on one psychological flexibility process, however, due to overlap, other processes were discussed.

Module content focused on core ACT principles that participants could apply to many situations, rather than including COVID-19 specific examples, due to the heterogenic and ubiquitous nature of COVID-related distress. The core aim of the intervention (consistent with our primary outcome of wellbeing) was to promote better living in the context of COVID-19. Participants were able to attend weekly scripted webinars facilitated by the lead researcher that related the concepts in the module to COVID-19. The facilitator answered questions submitted within the module and provided worked examples of how content related to COVID-19 issues. Participants also had the opportunity to ask questions or comment on module content during the webinar. Participants were able to omit the webinar if they felt they understood the material and were able to relate this to COVID-19.

The ACT consistency of module materials was assessed by two members of the research team trained in ACT who were not involved in the adaptation process prior to the start of the study: Assessors agreed that all ACT sub-processes were well-represented and that materials were model-consistent (with reference to Hayes & Smith, 2005). Webinars were videorecorded and the two research team members

assessed the ACT fidelity of their delivery according to criteria based on the ACT-FM (O’Neill et al., 2019). Scoring was adapted to reflect the more didactic and focussed nature of the webinar format: for each session, scores ranged from 0 to 15 with 15 indicating maximal ACT consistency (in the facilitator’s stance and in modelling of the focal ACT process for that session) with no ACT-inconsistent behaviours. Six sessions were selected for fidelity-rating: sessions were selected to represent the six weeks of intervention (one exemplar per week) and three participant groups (two exemplars per group). All six sessions were assessed as maximally ACT-consistent (15 out of 15).

### 3.4. Procedure

Three groups with stratified start dates (resulting in a non-concurrent multiple baseline) progressed through four phases over a period of 10 weeks (Fig. 1): pre-intervention; baseline; intervention; post-intervention. Follow-up occurred one- and two-months following the post-intervention phase for each group.

### 3.5. Pre-intervention and baseline

Participants received a study orientation video which outlined the study timeline and instructions (e.g., when to complete measures and modules, and a complete list of webinar dates). Participants then completed three weeks of measures (including pre-intervention measures) to establish a baseline. During the final baseline week, participants received an ‘introductory module’ outlining the ACT model and future content.

### 3.6. Intervention

Participants received one module at the start of each week throughout the intervention. Half-way through the week, participants were invited to a 1-h webinar related to the week’s content to address any questions and discuss COVID-related examples. Participants then had the opportunity to re-visit the module following the webinar before the next module was sent.

### 3.7. Post-intervention and follow-up

One week after the final module and webinar, participants repeated all measures and completed the post-intervention survey. One month and two months post-intervention, participants were sent all measures again to establish follow-up data.

### 3.8. Analysis

#### 3.8.1. Quantitative data

Longitudinal data analyses (such as multilevel modelling; MLM) are able to explain variation over time, both within and between participants, and are robust against missing data points (Tasca & Gallop, 2009). For each of the (six) weekly outcome and process variables (wellbeing, COVID-related distress, psychological flexibility, OE, BA, VA), baseline data were first explored for significant trends (i.e., any within-phase effect of time) to determine if a stable baseline was achieved.

MLM was then used to model the fixed effect of phase (0 = baseline, 1 = intervention) as a level-1 predictor within participants, with separate models examined for each of the (six) weekly outcome and process measures (as dependent variables). The fixed effect of group on these dependent variables was also modelled to explore between-participant effects (as a level-2 predictor). Wellbeing was our primary outcome of interest and modelling of this dependent variable thus formed our primary analysis.

MLMs were tested using Maximum Likelihood estimation in IBM SPSS Statistics V25 – consistent with this, missing data were handled via

**Table 3**  
Module content summary (including corresponding original book chapters).

Intervention phase week	Psychological flexibility process	ACT dyadic	Book chapter	Summary of content
0	Introduction to ACT	N/A	1, 2, 3	Overview of all modules, Identifying a therapy focus.
1	Acceptance and avoidance	OE	4, 9, 10	Problems and benefits of experiential avoidance/ acceptance.
2	Cognitive defusion	OE	5, 6	Costs and benefits of cognitive fusion, Various defusion techniques (e.g. semantic satiation, ‘leaves on a stream’).
3	Self-as-content/ fostering the ‘observer self’	BA	7	Introducing self-awareness and mindfulness. Observer self. Summary of previous weeks.
4	Present-moment awareness	BA	8	Exploring the importance of present-moment awareness. Various mindfulness practices (e.g. breathing techniques, mindful observation or activity engagement).
5	Values clarity	VA	11, 12	Values compared to goals. Identifying values.
6	Value-committed action	VA	13	Choice Point. Goal setting. Barriers to value-based living.

Week	Group 1	Group 2	Group 3												
1	Pre-intervention														
2	Baseline	Pre-intervention													
3		Baseline	Pre-intervention												
4	Intervention <sup>1</sup>		Intervention <sup>1</sup>	Baseline											
5		Intervention <sup>1</sup>		Intervention <sup>1</sup>	Intervention <sup>1</sup>										
6						Intervention <sup>1</sup>	Intervention <sup>1</sup>	Intervention <sup>1</sup>							
7									Intervention <sup>1</sup>	Intervention <sup>1</sup>	Intervention <sup>1</sup>				
8												Intervention <sup>1</sup>	Intervention <sup>1</sup>	Intervention <sup>1</sup>	
9															Intervention <sup>1</sup>
10	Post-intervention <sup>2</sup>		Intervention <sup>1</sup>												
11		Post-intervention <sup>2</sup>													
12		Post-intervention <sup>2</sup>													

Note. <sup>1</sup>Midpoint occurred halfway through the intervention phase, i.e. for group 1 this was halfway through week 6. <sup>2</sup>Follow-up occurred one- and two-months after the post-intervention phase, i.e. for group 1 this was week 14 and 18 respectively.

Fig. 1. Study phases for each group. Note. <sup>1</sup>Midpoint occurred halfway through the intervention phase, i.e. for group 1 this was halfway through week 6. <sup>2</sup>Follow-up occurred one- and two-months after the post-intervention phase, i.e. for group 1 this was week 14 and 18 respectively.

full information maximum likelihood estimation. Model fit was evaluated in terms of reduction in deviance (significance of change in negative log likelihood [-2LL]). For each predictor, random effects were added to test whether allowing relationships to vary between participants improved models: These effects were only retained in the model if they significantly improved model fit (reducing deviance [-2LL]). Time was centred at 0 so that intercept values correspond to the mean of the dependent variable at the start of the study. For each outcome model, we checked for normality of residuals (via histograms) and linearity (via scatterplots); we expected that the assumption of independence structure would be violated given likely autocorrelation over time (serial dependence in observations) and thus modelled a first-order autoregressive covariance structure (AR1) to account for this. Effect sizes for each model were calculated using guidance by Marso and Shadish (2014).

All ten outcome variables (the six weekly measures plus measures of general distress, depression, anxiety, and stress) were also analysed using a MLM approach examining timepoint (pre-, mid-, post-intervention, and two-month follow-up) as a fixed level-1 predictor using pairwise comparisons. Pairwise comparisons were handled in mixed models by treating timepoint as a 4-level factor (pre, mid, post, and two-month follow-up), testing the main effect of timepoint (in a separate model for each DV), and requesting between-level comparisons of estimated marginal means using Fisher's Least Significant Difference. Given the exploratory and secondary nature of these analyses, no adjustments were made for multiple comparisons. However, to illustrate the impact of applying multiplicity adjustments, we note where significant effects would not survive Bonferroni correction.

Prior to MLM analyses, we conducted descriptive analyses of demographic, process, and outcome variables. We also explored baseline differences between intervention completers versus non-completers using independent t-tests (for continuous variables) and Fisher exact tests (for categorical variables).

### 3.8.2. Qualitative data

A content analysis was conducted on qualitative, post-intervention survey data to explore contextual information supporting or refuting quantitative data, following guidance by Graneheim and Lundman (2004). To meet the aims of the study, a deductive analysis was primarily used (Kondracki et al., 2002) exploring: the effects of the intervention (including modules, webinar and other factors such as the

intervention/webinar facilitator) on wellbeing, COVID-related distress, and psychological distress. Factors surrounding psychological flexibility and its processes were also explored deductively and included use (or lack of use) of techniques, positive and/or negative changes and factors unrelated to the intervention (to account for nontherapeutic causes of change). Inductive analysis was also used to explore factors not related to the above but linked to the effects of the intervention, which were included as they emerged from the data. Final themes were developed in this inductive-deductive way (Kondracki et al., 2002). All post-intervention survey data were read several times to gain a holistic understanding of the text, then information related to the aims of the study was separated to create the unit of analysis. Meaning units were then established, condensed, and labelled into codes. Codes were grouped into subcategories then categories, to finally create overall themes.

### 3.8.3. Mixed methods integration

We applied a concurrent triangulation design (convergence model) in our approach to mixing methods (Creswell & Piano Clark, 2017). Quantitative and qualitative data were analysed separately (reported in the results section) and then interpretively synthesised and triangulated (in the discussion section).

## 4. Results

### 4.1. Participants

48 participants completed at least one baseline data point ('starters'); 22 participants in group one; and 13 participants in both groups two and three. 20 participants completed the six-week intervention ('completers'), with the majority of attrition occurring within the baseline phase ( $n = 15$ ) and early in the intervention phase ( $n = 12$  pre-midpoint;  $n = 2$  post-midpoint). Attrition rates are similar to those seen a similar study (Price et al., 2012). 22 participants completed post-intervention measures, including two participants who withdrew during the intervention phase and offered to complete exit measures. Eighteen participants completed both one- and two-month follow-up measures. Table 4 provides demographic information for 'starters' compared to 'completers', and shows similar demographic variables, as well as wellbeing and COVID-related distress pre-intervention scores, between the two. We tested for differences between intervention completers vs.

**Table 4**  
Demographic details and mean pre-intervention scores of participant ‘starters’ and ‘completers’.

Demographic details		Starters	Completers
Mean pre-intervention score (SD)	Wellbeing (SWEMWBS)	32.83 (SD 5.77)	33.57 (SD 5.61)
	COVID-related distress	6.4 (SD 2.1)	6.7 (SD 2.3)
Age	Mean	37.3years (SD 10.3; range 22–72)	39.7years (SD 11.6; range 28–72)
	n (%)	n (%)	n (%)
Gender	Female	37 77	18 90
	Male	6 13	2 10
	Nonbinary/Genderqueer	2 4	0 0
	Not disclosed	3 6	0 0
Ethnicity	British	2 4	1 5
	White	17 36	9 45
	White British	19 40	5 25
	White Irish	3 6	2 10
	White other	1 2	1 5
	Mixed ethnicity	1 2	1 5
	South East Asian	1 2	1 5
	Not disclosed	4 8	0 0
Working status at sign-up	Working as a key worker outside the home	8 17	4 20
	Working from home	20 42	10 50
	Furloughed	5 10	2 10
	Currently unemployed	11 23	4 20
	Not disclosed	3 6	0 0

Note. Demographic details refer to information taken at sign up (including information for ‘completers’) to allow for direct comparisons, as it is recognised that some details (namely, working status) may vary according to local lockdown restrictions.

non-completers and found equivalence (i.e., no statistically significant differences and effect-sizes <0.5 SDs) for all variables ( $ps \geq .233$ ,  $ds \leq 0.36$ ). Mean pre-intervention scores suggested at the beginning of the study participants were within the ‘low’ wellbeing range (below 19.3; Ng Fat et al., 2017) and were experiencing COVID-related distress (above 6 out of 10).

#### 4.2. Quantitative data

Parametric assumptions of normality were assessed and found to be adequate, data were found to be linear, and auto-correlation was taken into account during MLM modelling to accommodate the assumption of independent data points. Table 5 provides a summary of means and standard deviations for each outcome variable at each timepoint.

The six weekly outcome variables (wellbeing, COVID-related

**Table 5**  
Outcome variable means and standard deviations (SD) at pre-, mid-, and post-intervention, and at both one- and two-month follow-up timepoints.

Outcome variable	Pre-intervention (N = 45 <sup>1</sup> )		Midpoint (N = 25)		Post-intervention (N = 22)		One-month follow-up (N = 18)		Two-month follow-up (N = 18)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Wellbeing	18.00	3.59	20.64	3.66	21.91	5.04	22.61	5.46	21.61	4.86
Psychological flexibility	19.36	6.40	23.28	6.24	24.36	7.96	27.72	8.56	26.22	8.73
Openness to experience	5.91	3.29	7.12	3.76	7.82	4.40	9.00	4.37	8.11	4.74
Behavioural awareness	4.20	2.50	4.84	2.70	5.05	3.68	6.06	2.90	6.44	3.17
Valued action	9.24	3.47	11.32	3.18	11.50	3.31	12.67	3.34	11.67	3.14
COVID-related distress	6.49	2.03	6.60	2.50	6.05	2.73	6.22	2.73	5.33	2.45
General psychological distress	28.58	9.47	21.72	11.05	20.27	12.05	18.17	12.27	16.11	10.32
Depression	11.36	4.58	7.84	4.79	6.91	5.62	6.50	5.38	5.83	4.51
Anxiety	6.53	4.13	4.88	4.09	4.73	3.91	3.72	3.92	3.61	3.11
Stress	10.69	4.16	8.88	4.07	8.27	4.38	7.94	4.72	6.67	4.19

Note. <sup>1</sup>Three participants did not complete pre-intervention measures but did complete at least one baseline measure, meaning their data was included in the MLM analysis but not the pairwise analysis for the pre-intervention timepoint.

distress, psychological flexibility, OE, BA, VA) were modelled to explore the effect of phase on each variable (Table 6). No significant trends in baseline were found for any weekly outcome variable, suggesting a stable baseline. The effect of phase was found to be significant in all weekly outcome variables except COVID-related distress and OE – all other outcome variables improved following the addition of the intervention phase. Small-to-medium effect sizes were found for all outcome variables which exhibited this significant effect, except for overall psychological flexibility which demonstrated a medium-to-large effect size (Cohen, 1988). No significant effects were found between groups regarding these outcomes, suggesting group did not have an effect on outcomes.

Pairwise comparisons were conducted for all outcome variables between each timepoint (all six weekly outcome variables and general psychological distress, depression, anxiety and stress; Table 7 details the key pairwise comparisons). All significant changes occurred in the expected direction indicating improvement. For all outcome variables except BA and COVID-related distress, significant changes were found between pre- and post-intervention scores – indicating these had improved over the course of therapy. Of these outcome variables, all but OE demonstrated this significant change at midpoint, suggesting change occurred early in the intervention. No significant changes were seen between post-intervention and two-month follow-up for outcome variables which demonstrated significant changes between pre- and post-interventions – indicating post-therapy change was maintained.

Regarding BA, significant differences were found between pre-intervention and two-month follow-up scores, as well as between post-intervention and two-month follow-up. COVID-related distress showed a significant change between pre-intervention scores and two-month follow-up only.

#### 4.3. Qualitative data

All 20 intervention-completers engaged in the post-intervention survey, however three participants provided minimal information (fewer than four comments each). These participants’ views may, therefore, not be fully represented in analysis. Most themes had at least one contradictory opinion to the majority view. Participant quotations (‘ppt’) are provided throughout.

As depicted in Fig. 2, content analysis found five main themes regarding the effects of the intervention.

##### 4.3.1. Mental health outcomes

All participants discussed their mental health: most participants reported a general improvement; two participants reported no changes; and three participants reported worsening mental health. Of these three, one found the intervention unhelpful (but did not further specify); one did not comment on the intervention; and one described the

**Table 6**

MLM results exploring the fixed effect of intervention (phase) on each of the six outcome variables measured weekly.

	Wellbeing		COVID-related distress		Psychological flexibility		Openness to Experiences		Behavioural Awareness		Valued Action	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Fixed effects												
Intercept	18.84***	0.51	6.23	0.30	19.58***	0.77	5.80***	0.40	3.86	0.32	9.94***	0.41
Phase (0 = baseline, 1 = intervention)	0.96*	0.39	-0.20	0.19	2.19**	0.62	0.51	0.34	0.68*	0.26	0.94*	0.31
Autocorrelation over time (AR1)	0.75***	0.07	0.36***	0.09	0.61***	0.73	0.53***	0.08	0.54***	0.08	0.68***	0.08
Phase ES												
g (95% CI)	0.32 (0.06, 0.58)		-0.18 (-0.52, 0.17)		0.53 (0.23, 0.83)		0.23 (-0.08, 0.54)		0.41 (0.10, 0.72)		0.46 (0.16, 0.76)	
% variance	17%		0%		17%		4.6%		5%		22%	

Note. Models were extended to test for random effects and between-group differences; these parameters did not significantly improve model fit and are thus not reported. SE = Standard Error; ES = Effect Size; g = Hedges' g (unbiased estimate of standardised mean difference: intervention vs. baseline phase); % variance = percentage of within-person outcome variance explained by intervention (phase). \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

intervention as helpful but felt their “difficulties have escalated beyond this level of therapy” (due to changing life-circumstances; ppt16).

Three categories within this theme were identified: improved wellbeing; anxiety; and COVID-related distress.

**4.3.1.1. Improved wellbeing.** Improved wellbeing as an effect of the intervention was mentioned by 13 participants, making this the second most mentioned effect of the intervention after changes in psychological flexibility processes. Participants reported feeling “more positive” (ppt10) and “better about things” (ppt6), however some participants also referenced “feelings of wellbeing” (ppt20) specifically.

**4.3.1.2. Anxiety.** Twelve participants referenced ‘anxiety’. Most participants described reduced anxiety or feeling ‘calmer’ as a result of the intervention (“I felt ... very anxious. I feel much calmer now”, ppt5), whereas two participants reported feeling increased anxiety (“Being [more] nervous when out and about [since the start of the study]” ppt12). One participant (ppt12) specified that this was due to the COVID-19 pandemic, whereas the second (ppt18) did not express a reason.

Several participants described remaining anxious post-intervention, but felt they coped better (“worries are going up [because local restrictions are increasing] however, [my] behaviour is more relaxed”, ppt19).

#### 4.3.2. COVID-related distress

COVID-related distress was deductively explored within the text, yet only half of participants explicitly mentioned distress related to COVID-19. Two participants described “not worrying about COVID on a daily basis” (ppt20) as a result of the intervention; two participants expressed experiencing distress but feeling “calmer and more able to cope” (ppt14); and four participants reported being “still fearful of COVID-19” (ppt7). Two participants expressed that the effects of the intervention had “hit wider than COVID” (ppt17), as well as reducing COVID-related distress.

#### 4.3.3. Psychological flexibility processes

Sixteen participants described changes in psychological flexibility processes following the intervention. Thirteen participants stated that their acceptance of difficult experiences had increased, which positively impact their lives (“I have started to sit with my negative emotions which makes me feel better in the long run”, ppt3). One participant who reported worsening mental health post-intervention (due to changing life-circumstances) described acceptance as “particularly reassuring” within the intervention (ppt16).

Nine participants mentioned valued action, all positively. Participants particularly noted valued action (rather than values clarity) was helpful, however both were described as useful (“... made me think about my values and how I can move forward [with valued action]”,

ppt13).

Eight participants discussed finding defusion helpful, using defusion to aid other processes (e.g., valued action; “[the most useful thing about the intervention was] being able to put [my thoughts] down in a very meaningful way and getting on with things that are important to me”, ppt2). Defusion was also referred to as a useful tool to support participants to cope with difficult experiences (“... appreciated having [defusion techniques] to help me through these difficult emotions”, ppt15).

Eight participants discussed finding mindfulness helpful and reported increased present-moment awareness post-intervention, however no participant gave further detail on any wider effects.

#### 4.3.4. Insight into difficulties

Nine participants described that the intervention gave them increased insight into their experiences, making experiences more manageable (“... feel less confused as to why I'm feeling low”, ppt15). Different participants attributed this to different aspects of the intervention: four credited the normalisation of painful emotions (“ACT ... showed me that others must have [distress] too”, ppt11); four expressed values clarity helped them recognise their distress manifested from unworkable action (“... my feelings of distress are tangled in my values and ... my values are compromised”, ppt14); and three reported understanding theoretical underpinnings of ACT aided understanding themselves (“philosophical way of talking about thoughts ... really resonated with me”, ppt1). No participant gave a response that was inconsistent with (i.e., reputational to) this theme. One participant only provided one comment regarding the intervention within the post-intervention survey, which was that the intervention provided “interesting self-reflection” (ppt4).

#### 4.3.5. Increased autonomy

Seven participants expressed feeling “more in control” (ppt7) post-intervention. Although ‘control’ may be argued to be the antithesis of ‘acceptance’ within ACT, exploring the latent meaning and wider context of comments suggests participants were referencing to increased autonomy and an ability to manage distress (“[I feel] more in control, less powerless”, ppt6; “I have control of my thoughts, rather than letting them spiral ... I accept them”, ppt13).

#### 4.3.6. Improved self-worth

Six participants described increased self-esteem and motivations for self-care as a result of the intervention (“my self-worth changed for the better”, ppt14). Participants reported feeling “more confident in making decisions” (ppt2), “working on myself more” (ppt10) and that they now “give [themselves] time to reflect each day” (ppt7). Although fewer participants mentioned this area, it was mentioned repeatedly and was clearly of importance for these individuals.



**Table 7**

Pairwise comparisons comparing timepoint data for each of the ten outcome variables, measured over pre-, mid-, and post-intervention, and one- and two-month follow-up points.

Outcome variable	Mean difference (95% CI)	SE
<b>Wellbeing</b>		
Pre- to mid-	-2.37*** (-3.40, -1.34)	0.52
Pre- to post-	-3.05*** (-4.43, -1.67)	0.70
Pre- to two-month follow-up	-3.04*** (-4.86, -1.23)	0.92
Post- to two-month follow-up	0.01 (-1.58, 1.59)	0.80
<b>COVID-related distress</b>		
Pre- to mid-	0.10 (-0.52, 0.73)	0.32
Pre- to post-	0.40 (-0.42, 1.22)	0.41
Pre- to two-month follow-up	1.16*€ (0.11, 2.20)	0.53
Post- to two-month follow-up	0.75 (-0.19, 1.70)	0.48
<b>Psychological flexibility</b>		
Pre- to mid-	-3.50*** (-5.31, -1.70)	0.91
Pre- to post-	-4.63*** (-7.02, -2.23)	1.21
Pre- to two-month follow-up	-6.76*** (-9.86, -3.66)	1.57
Post- to two-month follow-up	-2.13 (-4.89, 0.62)	1.39
<b>Openness to experience</b>		
Pre- to mid-	-0.93 (-2.10, 0.24)	0.59
Pre- to post-	-1.71*€ (-3.21, -0.21)	0.76
Pre- to two-month follow-up	-2.30* (-4.17, -0.44)	0.94
Post- to two-month follow-up	-0.59 (-2.34, 1.16)	0.88
<b>Behavioural awareness</b>		
Pre- to mid-	-0.23 (-1.01, 0.54)	0.39
Pre- to post-	-0.74 (-1.75, 0.27)	0.51
Pre- to two-month follow-up	-1.98** (-3.27, -0.69)	0.65
Post- to two-month follow-up	-1.24*€ (-2.41, -0.07)	0.59
<b>Valued action</b>		
Pre- to mid-	-2.38*** (-3.37, -1.38)	0.50
Pre- to post-	-2.26** (-3.54, -0.98)	0.65
Pre- to two-month follow-up	-2.57** (-4.16, -0.98)	0.81
Post- to two-month follow-up	-0.31 (-1.80, 1.18)	0.75
Outcome variable	Mean difference (95% CI)	SE
<b>General psychological distress</b>		
Pre- to mid-	6.69*** (3.83, 9.54)	1.44
Pre- to post-	7.44*** (3.67, 11.21)	1.90
Pre- to two-month follow-up	10.81*** (5.95, 15.67)	2.46
Post- to two-month follow-up	3.38 (-0.97, 7.72)	2.19
<b>Depression</b>		
Pre- to mid-	3.88*** (2.53, 5.22)	0.68
Pre- to post-	4.06*** (2.30, 5.82)	0.89
Pre- to two-month follow-up	5.33*** (3.09, 7.57)	1.13
Post- to two-month follow-up	1.27 (-0.77, 3.30)	1.03
<b>Anxiety</b>		
Pre- to mid-	1.31*€ (0.14, 2.48)	0.59
Pre- to post-	1.56*€ (0.04, 3.08)	0.77
Pre- to two-month follow-up	2.33* (0.41, 4.26)	0.97
Post- to two-month follow-up	0.77 (-0.99, 2.54)	0.89
<b>Stress</b>		
Pre- to mid-	1.56*€ (0.26, 2.87)	0.66
Pre- to post-	1.95*€ (0.27, 3.64)	0.85
Pre- to two-month follow-up	3.40** (1.30, 5.51)	1.06
Post- to two-month follow-up	1.45 (-0.51, 3.41)	0.99

\*p < .05, \*\*p < .01, \*\*\*p < .001 € denotes effects that would not be significant if applying Bonferroni correction for multiple comparisons.

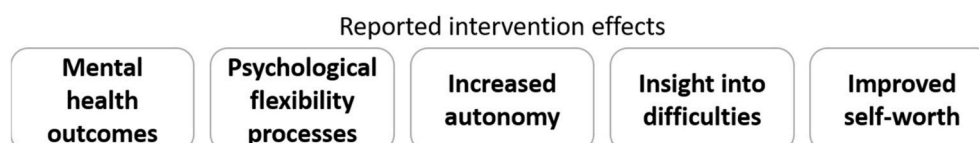
## 5. Discussion

This study aimed to explore the effects of a guided, self-help, ACT intervention on wellbeing for individuals who were experiencing COVID-related distress. Secondary aims were to explore the effects on COVID-related distress, psychological flexibility, and general psychological distress (including depression, stress, anxiety). Following the intervention, significant improvements were found for wellbeing, overall psychological flexibility (and one sub-process, VA) and general psychological distress (including depression, stress, and anxiety). All improvements were sustained at follow-up, suggesting lasting change. Qualitative results supported quantitative findings: most participants reported improved mental health (particularly anxiety) and improved wellbeing. Participants attributed outcomes to intervention techniques and increased psychological flexibility processes. Some participants reported negative changes post-intervention; participants typically attributed these to external COVID-19 factors (e.g., lockdown restriction changes).

### 5.1. Wellbeing and psychological flexibility

A wealth of literature supports the use of ACT in improving wellbeing (Gloster, Walder, et al., 2020; Stenhoff et al., 2020), and both the quantitative and qualitative results of this study add support to this claim. ACT is considered to improve wellbeing by increasing psychological flexibility (Gloster, Walder, et al., 2020), which is also supported by this study's results: wellbeing improved alongside psychological flexibility post-intervention. While the analysis completed means it cannot be claimed that wellbeing improved as a result of increased psychological flexibility, participants attributed improved wellbeing to using psychological flexibility processes (in their qualitative responses) – adding credibility to this idea. This effect may be caused by participants using psychological flexibility terminology to discuss changes as a result of socialisation to the model, however quantitative results also triangulate this finding. Furthermore, the online survey format may have reduced demand characteristics which might cue participants to use ACT-specific language or explanations. These points counteract the argument that these effects were only seen due to socialisation to the model.

Overall psychological flexibility improved, demonstrating medium-to-large effect sizes, yet analysis found differences between the three sub-processes. VA and BA both demonstrated a significant phase effect (following the addition of the intervention) with small-to-medium effect sizes, whereas no such effects were found for OE. Conversely, both VA and OE demonstrated significant improvements throughout the intervention when exploring the effect of timepoint, whereas BA showed no improvement until follow-up. Qualitatively, participants mentioned all three processes equally, yet described OE and VA techniques in detail whilst only vaguely referencing BA factors. These results could suggest that improvements in wellbeing come from an overall improvement in psychological flexibility, and therefore may still occur in the absence of improvements in specific sub-processes. Conversely, change in VA was consistently evidenced across analyses (and demonstrated the greatest effect size in phase-change analyses), indicating that (of ACT processes that might be contributory to outcome changes) increased engagement in valued living may be particularly potent.



**Fig. 2.** Themes identified from participant-reported effects of intervention.

## 5.2. COVID-related distress

COVID-related distress scores were high at both pre- and post-intervention (with a mean score of above 6 out of 10) and did not change significantly, suggesting participants were distressed by COVID-19 throughout the study. Notwithstanding this, it was notable that half of participants did not mention COVID-related distress specifically within qualitative data – despite the post-intervention survey prompting participants to do so. Of those that did, participants described either no longer experiencing COVID-related distress, or experiencing but coping better with COVID-related distress. One tentative interpretation of this finding is that participants felt more able to cope – i.e., respond flexibly and effectively to distressing feelings that (continue to) arise in relation to COVID-19 – and therefore did not raise the topic within the survey. However, within the current study, there is insufficient data to support this interpretation, and the quantitative results must be accorded greater weight. Thus, from the results of this study, it can only be concluded that the intervention did not significantly change COVID-related distress for most participants – albeit that the strength of this conclusion is limited by measurement concerns (discussed further below). Notwithstanding measurement issues, it is unclear why COVID-related distress was unchanged while (as discussed below) general distress reduced. One possible interpretation is that ACT skills buffered the impact of feelings about COVID-19 on more general distress (i.e., upsetting feelings about COVID continue to arise but are not responded to in ways that feed secondary distress) Indeed, emotional engagement with the COVID-19 situation could be adaptive (harnessing distress to mobilise valued actions), such that COVID-specific distress becomes dissociable from general distress and attendant patterns of inflexible responding (Starr et al., 2021).

## 5.3. General psychological distress

ACT does not aim to reduce psychological distress (Harris, 2006; Hayes et al., 2012). It is interesting, therefore, that all domains of psychological distress (including overall distress, depression, anxiety and stress), significantly reduced following the introduction of the intervention which was maintained at follow-up. This finding is similar to existing literature – ACT has been consistently found to reduce rates of depression, anxiety, and other mental health conditions (Bai et al., 2020; Stenhoff et al., 2020; Swain et al., 2013). In this instance, qualitative results may help to shed light on this phenomenon. During the post-intervention survey, several participants described experiences of anxiety (of similar or greater intensity as before intervention) yet felt more able to cope with these experiences. Thus, some participants in this study gave accounts that cohere with the (model-consistent) notion that, without targeting the reduction of distress, ACT skills can potentially enable more effective responding to distressing experiences. Theoretically, distress may reduce as a by-product of ACT-targeted changes in responding (e.g., secondary to enabling increased valued living in the presence of distressing experiences). This notion was further reflected in experiential themes of autonomy after learning new tools to cope with distress; understanding of the drivers of distress (making it easier to accept); and ability to engage in self-care (reducing levels of psychological distress).

## 5.4. Limitations in the COVID-related distress measurement

The study found that the intervention improved wellbeing and psychological distress yet had a limited effect on COVID-related distress. These seemingly contradictory findings reveal a key weakness within the study – namely regarding the potential insensitivity of the quantitative measure of COVID-related distress itself. The study was responsive to the evolving COVID-19 situation and at the time of inception no peer reviewed measures to assess COVID-related distress existed. Instead, COVID-related distress was measured by one weekly question which

asked “Over the past week, how have you felt about the COVID-19 situation?” on a Likert-scale of 0 (“I have been feeling OK about it”) to 10 (“I have been extremely distressed by it”). It may be that this question did not fully or accurately capture COVID-related distress, meaning findings related to COVID-related distress may not be valid or reliable. Instead, this study’s findings regarding COVID-related distress may be seen as an indication of participants’ experiences, rather than firm conclusions, and warrant further scientific investigation. The findings regarding increased wellbeing and lower psychological distress, however, were established using measures with strong psychometric qualities, and therefore these findings may be more representative of the effects of the intervention.

## 5.5. Clinical implications and strengths of the study

A growth of literature has identified psychological flexibility as an underlying process surrounding the dramatic increases in mental health difficulties related to the COVID-19 pandemic (Dawson & Golijani-Moghaddam, 2020; Kroska et al., 2020; Pakenham et al., 2020). Psychological flexibility has been found to be malleable and trainable to support individuals to cope with distressing events, and interventions which target psychological flexibility may be particularly helpful in mitigating the mental health effects of the COVID-19 pandemic (Gloster et al., 2017, 2020a; Kroska et al., 2020). At the time of writing, this is the first study to proceed to intervention and demonstrate that ACT, an intervention targeting psychological flexibility, improves wellbeing within the context of the COVID-19 pandemic. The non-concurrent baseline, time-series design and multiple testing improved internal validity, while the anonymous format of the post-intervention survey may have reduced demand characteristics – further supporting the findings of the study and highlighting an important study strength.

This study also presents a scalable intervention (i.e., one that could be readily adapted to greater demand, as a low-resource digital provision) which is flexible and remotely accessible: making it well suited to delivery within the current climate. The materials used were adapted, condensed, and digitised from previously established materials to become semi-interactive (Davies, 2018; Hayes & Smith, 2005), facilitating an accessible and acceptable intervention for those struggling with the psychological effects of COVID-19. It should be noted, however, that accessibility and acceptability were not assessed within this study. Detailed information regarding module use was not gathered as this was outside the aims of this study, however most participants commented about the modules in the post-intervention survey. Comments were typically positive; however, some activities and sections were noted to be unhelpful or inaccessible.

Furthermore, considerable attrition was observed within the study: the majority of those who completed the initial signup did not complete the intervention. Attrition and missing data increased the potential for biased estimates of effects (particularly in the context of a limited initial sample size). We used full information maximum likelihood estimation to obtain parameter estimates using all available data – enabling inclusion of data from all individuals (including those who drop out or miss individual data-points) – and this approach has been shown to produce estimates that are the best estimates of true effects (observed in complete data sets) under conditions of missingness (e.g., Witkiewitz et al., 2014), outperforming other approaches to handling missing data. Nonetheless, there is likely to be bias in parameter estimates given the reduced data available at later timepoints, and this is an important caveat to our results. In terms of measured variables, completers and non-completers did not show substantive differences at baseline, but there may be unmeasured differences accounting for dropout. The observed pattern of early dropout (including non-usage [i.e., pre-intervention] attrition) is like that observed by Price et al. (2012) in their (contextually comparable) study of a web-based intervention for post-disaster mental health. Price et al. investigated reasons for early dropout and found that previous experience of considering/using online

mental health resources buffered against attrition – this may have been an (unmeasured) factor contributing to variable engagement in the current study.

Moreover, the observed attrition highlights implementation issues, suggesting that, now the intervention has been initially developed, it may benefit from further research exploring accessibility and acceptability. This may include general intervention factors (such as situational or individual factors which may affect usefulness of the intervention for individuals or attrition), or specific module factors (such as particular activities or sections targeting specific sub-processes). It is noteworthy that – despite an open recruitment strategy, in a context of elevated need – there was limited uptake of the offered intervention. The restricted reach of the intervention invites further investigation: to understand any issues with access, awareness, and perceived appropriateness, which could impede further applications. The additional assessment burdens of the research design (with its three-week baseline period) may have inhibited uptake in the current study. Following assessment of accessibility and acceptability, the effects of the intervention could be more rigorously tested by applying a randomised controlled trial design.

## 6. Conclusion

Several studies have identified psychological flexibility as a target mechanism for addressing COVID-19 related distress. At the time of writing, this is the first study to implement an ACT intervention to explore the effects of this. Both quantitative and qualitative findings suggest ACT improves wellbeing, as well as psychological flexibility and psychological distress. COVID-related distress did not reduce following the intervention; however, this may be due to limitations in the ways in which this was measured. The intervention has demonstrated promising effects utilising a scalable and remotely deliverable materials (suited to the current context); however, further research is needed to consider acceptability and accessibility to promote engagement and rigorously test efficacy and effectiveness. Finally, no significant changes were observed between post-intervention and two-month follow-up for outcome variables which demonstrated significant changes between pre- and post-intervention; while maintenance of post-therapy change is welcome, it would be advantageous to examine whether inclusion of a post-intervention ‘booster session’ might help to retain or potentially enhance the observed therapeutic outcomes in the longer term.

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## Declaration of competing interest

The authors declare no conflicts of interest.

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