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Running head: ACT for distressed healthcare workers

Acceptance and commitment therapy for clinically distressed healthcare workers: Waitlist controlled evaluation of an ACT workshop in a routine practice setting

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Abstract

Objectives. To examine the effects of a one-day acceptance and commitment therapy (ACT) workshop on the mental health of clinically distressed healthcare employees; and to explore ACT's processes of change in a routine practice setting.

Design. A quasi-controlled design, with participants block allocated to an ACT intervention or waiting list control group based on self-referral date.

Methods. Participants were 35 healthcare workers who had self-referred for the ACT workshop via a clinical support service for staff. Measures were completed by ACT and control group participants at preintervention and 3 months postintervention. Participants allocated to the waitlist condition went on to receive the ACT intervention and were also assessed 3 months later.

Results. At 3 months postintervention, participants in the ACT group reported a significantly lower level of psychological distress compared to the control group ($d = 1.41$). Across the 3 month evaluation period, clinically significant change was exhibited by 50% of ACT participants, compared to 0% in the control group. When the control group received the same ACT intervention, 69% went on to exhibit clinically significant change. The ACT intervention also resulted in significant improvements in psychological flexibility, defusion, and mindfulness skills, but did not significantly reduce the frequency of negative cognitions. Bootstrapped mediation analyses indicated that the reduction in distress in the ACT condition was primarily associated with an increase in mindfulness skills, especially observing and nonreactivity.

Conclusions. These findings provide preliminary support for providing brief ACT interventions as part of routine clinical support services for distressed workers.

Practitioner points

- A one-day ACT workshop delivered in the context of a routine staff support service was effective for reducing psychological distress among healthcare workers.

- The brief nature of this group intervention means it may be particularly suitable for staff support and primary care mental health service settings.

- The findings indicate that the beneficial effects of an ACT workshop on distressed employees' mental health were linked to improvements in specific mindfulness skills.

- Study limitations include nonrandom allocation of participants to the ACT and control groups; and measurement of mediators and outcome at the same time point (3 months postintervention).

Acceptance and commitment therapy for clinically distressed healthcare workers: Waitlist controlled evaluation of an ACT workshop in a routine practice setting

There has been widespread concern about the individual, organisational, and societal impact of common mental health difficulties among working populations (Hardy, Woods, & Wall, 2003; Health and Safety Executive (HSE), 2016; Kerr, McHugh, & McCrory, 2009; Kessler, Merikangas, & Wang, 2008). In the UK alone, it is estimated that some 25% of the general working population is experiencing a common mental health problem at any one time, resulting in approximately 10 million lost working days per annum (HSE, 2016; Stride, Wall, & Catley, 2007). Across different occupations, healthcare (e.g., nursing) staff have been consistently identified as experiencing above average rates of stress, anxiety, and depression (Clegg, 2001; HSE, 2016). However, a surprisingly small proportion of clinically distressed workers are thought to gain access to evidence-based psychotherapeutic interventions (Hilton et al. 2008; Seymour & Grove, 2005).

In response to this challenge, there has been longstanding interest in applying developments in clinical psychology theory and practice to help improve mental health in workplace settings (e.g., Bunce, 1997; Meichenbaum, 1985; Murphy, 1996; Richardson & Rothstein, 2008; van der Klink et al., 2001). One intervention model that has been attracting recent interest from occupational health researchers and practitioners is acceptance and commitment therapy (ACT). Commonly referred to as a "contextual" or mindfulness-based behaviour therapy, ACT places particular emphasis on the function (rather than the form or frequency) of psychological events—such as thoughts, feelings, sensations, and behavioural impulses (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). Unlike more traditional CBT approaches, which tend to focus on modifying psychological events directly (e.g., by challenging the validity of negative automatic thoughts), ACT seeks to alter the behavioural

influence of those events through a combination of mindfulness and values-based behavioural activation strategies (Hayes et al. 2006; Hayes, Villatte, Levin, & Hildebrandt, 2011).

The stated aim of ACT is to enhance *psychological flexibility*, which is technically defined as the ability to contact the present moment fully as a conscious human being, and to persist or change behaviour in the service of chosen values (Hayes, Strosahl, Bunting, Twohig, & Wilson, 2004). In simpler terms, ACT seeks to help people pursue and expand personally valued patterns of behaviour, even while experiencing difficult or unhelpful thoughts, feelings, sensations, and urges. To enhance psychological flexibility, ACT interventions target six interrelated therapeutic processes: contact with the present moment, acceptance, cognitive defusion, self-as-context, values clarification, and committed action (Hayes et al., 2006).

A large body of research supports the utility of ACT as a treatment for various clinical presentations (for reviews see A-Tjak et al., 2015; Graham, Gouick, Krahe, et al., 2016; Hayes et al. 2006; Öst, 2008, 2014; Powers, Vörding, & Emmelkamp, 2009; Pull, 2008; Ruiz, 2010; Swain, Hancock, Hainsworth, & Bowman, 2013; Veehof, Oskam, Schreurs, & Bohlmeijer, 2011; Vøllestad, Nielsen, & Nielsen, 2012). In the workplace context, ACT has been translated into brief, skills-based, and group format training programmes that can be delivered to general working populations (e.g., Brinkborg, Michanek, Hesser, & Berglund, 2011; Flaxman & Bond, 2006, 2010a; Flaxman, Bond, & Livheim, 2013). Several previous workplace studies have demonstrated that brief ACT-based training programmes can elicit significant improvements in employees' general mental health and reductions in work-related burnout (e.g., Bond & Bunce, 2000; Brinkborg et al., 2011; Flaxman & Bond, 2010b; Frögéli, Djordjevic, Rudman, Livheim, & Gustavsson, 2015; Lloyd, Bond, & Flaxman, 2013; McConachie, McKenzie, Morris, & Walley, 2014).

The present study seeks to contribute to this emergent strand of intervention research and practice in two ways. First, most previous evaluations of ACT-based training in the workplace have been efficacy studies (i.e., RCTs) that were initiated and orchestrated by research teams external to the participating organisations. This means that (a) the ACT interventions being evaluated were typically delivered by external practitioners, who had been specifically trained to deliver the study's intervention protocol; and (b) the workplace ACT interventions that have been evaluated thus far were (as far as we are aware) not routinely available to the participating organisations' employees before or after the research studies were completed. Notwithstanding the strengths and influence of this type of intervention efficacy research, it is important to gather supplementary evidence of an intervention's effectiveness within more routine practice settings (e.g., Barkham & Mellor-Clark, 2000, 2003; Barkham & Margison, 2007; Barkham et al., 2008; Borkovec, Echemendia, Ragusea, & Ruiz, 2001; Cahill, Barkham, & Stiles, 2010; Shadish, Navarro, Matt, & Phillips, 2000).

Accordingly, the first aim of the present study is to adopt a *practice-based* approach, by evaluating a full-day ACT workshop being offered as a routine and integral part of an organisation's clinical support provision for psychologically distressed staff. This practice-based approach may help to address calls for research that exhibits greatest relevance to how therapeutic interventions are likely to be delivered in routine practice settings (Barkham & Margison, 2007). In addition, by evaluating an ACT program offered by an established clinical service for staff, we anticipated attracting a sample of employees with a clinical level of psychological distress, thereby avoiding the "dilution" effect encountered in previous studies of ACT in the workplace that have attracted heterogeneous groups of workers (Bond & Bunce, 2000; Flaxman & Bond, 2010b; see also Bunce, 1997; Bunce & Stephenson, 2000).

The second aim of this study is to assess the specificity of ACT's putative processes of change within this clinical practice setting. In particular, we test a central theoretical assumption of the ACT approach: that ACT interventions operate primarily by altering the *function*--rather than the form or frequency--of negative or difficult psychological content (Hayes et al., 2006). To this end, we explore the degree to which beneficial effects of an ACT workshop on employees' mental health are related to: (a) a reduced influence of difficult psychological content over behaviour (i.e., increased psychological flexibility); (b) a change in employees' relationship with their negative or difficult cognitive and emotional experiences (i.e., reduced cognitive fusion and enhanced mindfulness skills); or (c) a reduction in the frequency of negative cognitions. Evidence that an ACT intervention's beneficial effects are being transmitted through changes in (a) and/or (b)--and *not* (c)--would be congruent with ACT theory (Hayes et al., 2006).

We utilised a quasi-controlled design in which healthcare employees were allocated in blocks, according to self-referral date, to a one-day ACT workshop or to a waiting list control group. We predicted that the ACT workshop would lead to significant improvements in the mental health of clinically distressed employees over a three month evaluation period. We further hypothesised that the anticipated beneficial effects of ACT on employees' mental health would be mediated through improvements in "ACT-consistent" therapeutic processes (i.e., enhanced psychological flexibility, cognitive defusion, and/or mindfulness skills), and *not* via a reduction in the frequency of negative automatic thoughts.

Method

Participants and procedure

Participants were employees of a large healthcare organisation in Wales, UK. An advertisement for the ACT intervention was posted on an intranet page by the staff support service and circulated by email. At the point of self-referral, employees were placed on a

waiting list, and received a provisional booking for the ACT workshop, along with an invitation to participate in the research study. The initial pack sent to interested employees contained information about the intervention (e.g., basic aims, dates, and venue), and the research study (e.g., how to provide consent), preintervention (baseline) surveys, and a prepaid envelope for returning completed surveys. There were no inclusion or exclusion criteria for attending the ACT intervention or participating in the research.

During the period of the study, a total of 50 employees were booked in to attend the ACT workshop. Out of these 50 employees, 35 (70%) consented to participate in the research, completed preintervention measures, and were allocated to the ACT workshop or to a waiting list control group. There were no significant differences between those who did/ didn't consent to participate in level of psychological distress or on any of the collected demographic variables (i.e., gender, age, job role, job tenure, marital status, or educational level).

The staff support service's management committee expressed concern about holding distressed members of staff on a waiting list for evaluation purposes. In consultation with this committee, the organisation's research and development (R&D) department, and a local ethics review panel, it was agreed that allocation to study condition could be conducted in blocks according to self-referral date. Thus, the first 8 employees who had referred themselves for the intervention were allocated to the next batch of ACT workshops, the next 8 were allocated to the waiting list, and so on, until 17 participants had been allocated to the ACT workshop and 18 to the waiting list control group (see Figure 1 for participant flow through the study). There were no significant differences found on any study or demographic variable between the ACT and control groups (see Table 1 for more detailed sample characteristics). All study procedures were approved by the local research ethics committee.

To assess the degree of psychological distress in the sample, each participant's baseline caseness score was calculated on the general health questionnaire (GHQ-12). Using the caseness scoring method, a score of 4 or more on the GHQ-12 indicates a probable case of minor psychiatric disorder (typically anxiety and/ or depression) in a working population (e.g., Stride et al., 2007; Wall et al., 1997). Of the 15 participants in the ACT group who went on to receive the intervention, 14 (93%) had a preintervention GHQ-12 caseness score of 4 or above. Similarly, 13 of the 18 (72%) control group participants had a baseline GHQ-12 score ≥ 4. Thus, as anticipated, offering ACT within a clinical service for staff attracted a sample of employees with an above average and clinically relevant level of psychological distress

Measures

General health questionnaire-12 (GHQ-12; Goldberg & Williams, 1988).

This 12-item scale is one of the most widely used and validated measures of general psychological distress, defined in terms of cognitions (e.g., worry), emotions (e.g., feeling constantly under strain), and day-to-day functioning (e.g., feeling able to play a useful part in things). The Likert scoring method was used for all main analyses (Goldberg et al., 1997). This method assigns values of 0, 1, 2 and 3 to the GHQ's four response options. Higher scores indicate greater psychological distress. The GHQ-12 exhibited high internal consistency in the current study: Cronbach alphas (α) were .91 at preintervention and α = .92 at 3 months postintervention.

Acceptance and action questionnaire–II (AAQ-II; Bond et al. 2011).

The 7-item AAQ-II is a widely used measures of psychological flexibility in the ACT literature. The scale captures a person's (lack of) willingness to experience undesirable psychological content (e.g., "I worry about not being able to control my worries and feelings"); and the extent to which difficult thoughts and feelings are having an unhelpful influence over behaviour (e.g., "Worries get in the way of my success"). In the current study

the scale was reverse scored, so that higher scores indicated greater psychological flexibility.

Alpha coefficients were α = .84 at preintervention and α = .88 at 3 months postintervention.

Five facet mindfulness questionnaire (FFMQ; *Baer, Smith, Hopkins, Krietemeyer, & Toney,*
2006).

This 39-item scale measures a combination of five mindfulness skill facets: *observing* (e.g.,
"When I'm walking, I deliberately notice the sensations of my body moving"); *describing*
(labelling with words; e.g., "I'm good at finding the words to describe my feelings"); *acting*
with awareness (e.g., "I find it difficult to stay focused on what's happening in the present");
nonjudging of experience (e.g., "I make judgments about whether my thoughts are good or
bad"); and *nonreactivity* to difficult inner experience (e.g., "When I have distressing thoughts
or images, I am able just to notice them without reacting"). In the current study, Cronbach
alphas for FFMQ total score were α = .89 at preintervention and α = .94 at 3 months
postintervention. A higher score indicates a greater degree of mindfulness.

Automatic thoughts questionnaire (ATQ; Hollon & Kendall, 1980).

The ATQ is a 30-item scale of negative (depressogenic) cognitive content (e.g., "I can't get
things together"; "I'm a failure"). In its original form, the ATQ measures the frequency
(ATQ-F) of such thoughts, with a response scale ranging from 1 *(not at all)* to 5 *(all the*
time). ACT researchers extended the original scale to create a measure of *believability* in
negative thought content (ATQ-B; Zettle & Hayes, 1986). The ATQ-B uses the same set of
30 negative automatic thoughts, but respondents are asked to rate how strongly, if at all, they
believe the listed thoughts, when they occur (with a response scale ranging from 1 *not at all*
to 5 *totally*). The ATQ-B is used as a proxy measure of *cognitive fusion* (Hayes et al., 2006).
In the current sample, reliability coefficients for the ATQ-F were α = .95 at preintervention
and α = .98 at 3 months postintervention; ATQ-B α = .94 at preintervention and α = .97 at 3
months postintervention.

ACT intervention

The one-day ACT workshop was already being routinely delivered by the organisation's in-house staff support service on frequent occasions, between 9am-5pm, to groups of between 8 and 12 participants. All of the workshops evaluated in this study were delivered by the same in-house counsellor/ ACT therapist, who had extensive experience of delivering individual and group psychotherapy. The therapist had previously attended training in an ACT for the workplace by one of the programme's originators, and received regular clinical supervision throughout the study.

The content of the workshop was based on an ACT for the workplace training approach described by Flaxman and Bond (2006; see also Flaxman & Bond, 2010a; Flaxman, et al., 2013). The workshop sought to offer participants an integration of mindfulness and values-based action skills. Participants were introduced to various techniques that were designed to: (1) raise awareness of psychological barriers (such as "unhelpful" thoughts) to engagement in personally valued action; (2) undermine the use of internal control efforts as a way of managing unwanted thoughts and emotions; (3) raise awareness of the distinction between strategies that work inside the skin/ outside the skin; (4) cultivate defusion through mindfulness practices that involve noticing the *process* of thinking; and (5) help participants clarify personal values that could be used as a meaningful guide to daily action. The trainer made use of two of ACT's well-known metaphors--passengers on the bus and the polygraph metaphor (Hayes, Strosahl, & Wilson, 1999)--to help convey key messages and summarise the approach. Towards the end of the workshop, participants were invited to reflect and share within the group how they might transfer the learning, and further cultivate mindfulness and valuing skills, in their daily lives.

Data analyses

Data were analyzed in two stages. First, we examined the effects of the ACT intervention on employees' general mental health (i.e., GHQ-12), psychological flexibility (AAQ-II), mindfulness skills (FFMQ), and on the frequency (ATQ-F) and believability (ATQ-B) of negative automatic thoughts across the 3 month evaluation period. These outcome analyses were performed on an intent-to-treat (ITT) basis, following multiple imputation (MI) of missing data (using SPSS version 22 multiple imputation procedure). All 35 participants who had been allocated to condition were included in the ITT analyses. Results were pooled across five imputations for each variable. Because SPSS reports pooled MI results for linear regression but not ANCOVA, we present unstandardized regression coefficients for each between-group comparison at 3 months postintervention, controlling for the relevant preintervention scores.

Second, we computed a series of bootstrapped multiple mediation models using the PROCESS macro and syntax for SPSS (Hayes, 2013; Preacher & Hayes, 2008). This bootstrapped analysis was based on 5000 iterations, and was utilised to test for indirect effects of the ACT intervention on employees' mental health via ACT-consistent processes of change (i.e., psychological flexibility, defusion, and/or mindfulness skills), above and beyond any change in the frequency of negative automatic thinking.

Results

Participant attrition

As indicated in Figure 1, two participants allocated to the ACT group did not attend the intervention. One other participant in the ACT group attended the workshop but failed to return postintervention measures. In the control group, two participants did not return postintervention measures. As a result, the completer sample comprised of 30 participants.

ITT outcome analyses

Effect of ACT on employees' mental health (GHQ-12)

Table 2 displays pooled descriptive statistics for the ITT sample ($N = 35$), along with between-group effects evident at 3 months postintervention (after controlling for preintervention scores on the variable of interest). Consistent with our first hypothesis, the ACT group reported a significantly lower level of psychological distress at 3 months postintervention compared to the control group: B = 9.39, $p < .001$, $d = 1.41$.

Clinical significance

The clinical relevance of this improvement on the GHQ-12 was assessed using Jacobson et al.'s two criteria for establishing clinically significant change (e.g., Jacobson, Roberts, Berns, & McGlinchey, 1999; Jacobson & Truax, 1991). At 3 months postintervention, 50% (7 out of 14) of the initially distressed participants who had attended the ACT intervention met the criteria for reliable and clinically meaningful change, and were therefore defined as "recovered". The remaining 50% of ACT participants were classified as the "same". In contrast, none of the initially distressed control group participants exhibited clinically significant improvement across the same 3 month assessment period. One participant in the control group reported a significant increase on the GHQ-12 across the study period, and was classified as "reliably deteriorated".

The control group participants subsequently received the intervention following three months on the waiting list. Three months after receiving the same ACT intervention, 9 out of the 13 initially distressed participants (69%) who had been on the waiting list met the criteria for clinically significant change on the GHQ-12, and were classified as recovered. The remaining 4 participants were classified as the same.

Effects of ACT on psychological flexibility (AAQ-II), mindfulness (FFMQ), defusion (ATQ-B), and frequency of negative automatic thoughts (ATQ-F).

The effects of ACT on the potential process of change variables were assessed in the ITT sample. As shown in Table 2, at 3 months postintervention, participants in the ACT condition

had significantly higher levels of psychological flexibility (B = -6.40, p = .03), mindfulness skills (B = -14.62, p = .001), and exhibited less fusion with negative cognitions (B = 16.54, p = .04). In contrast, the ACT workshop did not result in a statistically significant reduction in the frequency of negative automatic thoughts (B = 8.81, ns). The same pattern of results was found in the ITT and the completer data, suggesting that participant drop-out had little impact on study findings. Table 3 displays the correlations between the study variables.

Bootstrapped mediation analyses

To test the hypothesis that ACT operates primarily by altering the function of difficult thoughts and feelings, and not by altering their form or frequency, we constructed three bootstrapped multiple mediator models. In these models we tested for indirect effects of the ACT workshop on employees' mental health (i.e., pre to post change on the GHQ-12) through each of the ACT-consistent processes, while controlling for any change in the frequency of negative cognitions (i.e., the ATQ-F).

Table 4 summarises the results. Only one of the three models showed statistically significant total and specific indirect effects. There was a specific indirect effect of the ACT intervention on the GHQ-12 via an increase in employees' mindfulness skills from pre to postintervention: estimate = 2.42, BCa 95% [CI .42, 7.21]. In addition, there was a significant contrast comparing the relative influence of change in mindfulness skills and change in the frequency of negative cognitions: estimate = 2.54, BCa 95% [CI .17, 9.89]. This latter finding suggests that ACT's effect on employees' mental health via an increase in mindfulness was significantly larger than the effect occurring through a reduction in the frequency of negative thoughts.

Given that mindfulness was found to be the most influential mediator of GHQ-12 change, we explored whether the ACT workshop was having a particularly strong effect on a subset of the FFMQ's facets. We found significant group by time interaction effects only for

the FFMQ's *observing* and *nonreactivity* subscales. In addition, at 3 months postintervention (while controlling for preintervention scores on each facet), the ACT group had significantly higher scores than the control group on observing (B = -3.53, SE = 1.60, t = -2.21, p = .04) and nonreactivity (B = -3.05, SE = 1.01, t = -3.01, p = .006). We therefore entered the observing and nonreactivity facets together in a multiple mediator model alongside the ATQ-F (see Table 5). This model's total indirect effect was statistically significant. There were also significant specific indirect effects of ACT on employees' mental health via the increase in observing (estimate = 1.72, BCa 95% CI .07, 5.09) and via the increase in nonreactivity (estimate = 2.52, BCa 95% CI .12, 6.45). The specific indirect effect of ACT on the GHQ-12 via change in the frequency of negative thinking was not significant.

Discussion

The aims of this study were to: (1) assess the effects a one-day ACT workshop being delivered in a routine practice setting for clinically distressed healthcare employees, and (2) explore the specificity of ACT's processes of change. Our results indicate that ACT was effective in improving the general mental health of a sample of self-referred employees across a three month evaluation period. Moreover, and despite the brevity of the intervention, between one-half and two-thirds of initially distressed employees who attended the ACT workshop exhibited clinically significant improvement on the GHQ-12. This is an encouraging finding, given the prevalence (and costs) of common mental health problems, and poor access-to-treatment rates, being found among working populations (Hardy et al., 2003; Hilton et al., 2008).

Our outcome findings are consistent with previous studies of ACT in workplace settings, which have also reported moderate to large improvements in mental health (including on the GHQ-12) following similarly brief ACT-based training programmes (e.g., Brinkborg et al., 2011; Flaxman & Bond, 2010b,c). Our findings make a novel contribution

to this strand of research, by showing that similar effects are found when ACT is delivered within a routine staff support setting, and not just when ACT is being offered to organisations as part of standalone and externally orchestrated RCTs.

It is worth noting how our practice-based evaluation approach differs from previous studies of ACT in the workplace. By offering ACT via a clinical support service for staff, we attracted a sample of employees with a significantly higher average level of psychological distress than has been observed in previous studies (Bond and Bunce, 2000; Brinkborg et al., 2011. Flaxman and Bond (2010b) noted that around 50% of employees recruited to a similar ACT worksite intervention offered as part of an RCT were presenting with clinically relevant levels of psychological distress (compared to 90% in the present study). Thus, we believe that offering this type of ACT programme within a workplace clinical service is a useful way of attracting those employees who are most in need of psychotherapeutic assistance.

A second contribution of this study stems from our assessment of various potential psychological processes of change when a one-day ACT workshop is offered in a staff support setting. Consistent with ACT's underlying theory, we found that the ACT workshop resulted in significant improvements in psychological flexibility, defusion, and mindfulness, but had less impact on the frequency with which distressed employees' were experiencing negative automatic thoughts. Moreover, when we allowed each of the ACT-consistent processes to "compete" with change in the frequency of negative thinking in multiple mediator models, ACT was found to be improving mental health primarily by strengthening employees' mindfulness skills (i.e., via pre to post change on the FFMQ). This finding suggests that ACT, similar to other mindfulness-based interventions (MBIs), works in part by modifying people's relationship with negative or difficult psychological content.

The significant indirect effect through mindfulness also lends some support to those who argue that the various MBI approaches (such as ACT, MBCT, and MBSR)--though

underpinned by different theories and characterised by different techniques--are targeting some fundamentally similar psychological processes (e.g., Baer, 2010; Hayes et al., 2011). In terms of practicality, it is noteworthy that workplace ACT programmes are typically briefer than some other workplace MBIs (e.g., the 8-week MBSR programme), and involve less formal meditation practice. Thus, we tentatively suggest that ACT may offer an alternative for some distressed employees who may benefit from enhancing their mindfulness skills, but are unlikely (or unable) to engage in more lengthy meditation-based interventions. One useful avenue for future research in this area would be to directly compare the effects of brief ACT programmes with more elaborate MBIs in a workplace setting.

Further analyses revealed that two specific mindfulness skills seemed to be operating as especially influential processes of change in the present study: an increased ability to notice bodily sensations and sensory input across the five senses (i.e., the FFMQ's *observing* skill facet), and the development of a less reactive stance toward difficult thoughts and feelings (i.e., the FFMQ's *nonreactivity* skill facet). At a theoretical level, it is not difficult to see the congruence between these two mindful skill facets and the set of mindfulness/ acceptance processes in ACT's model of psychological flexibility (Hayes et al., 2004, 2006). Specifically, the capacity to observe one's direct, present moment experience mirrors ACT's "aware" processes (i.e., present moment awareness and self-as-context); while the nonreactivity facet aligns with ACT's "open" processes (i.e., defusion and acceptance; Hayes et al., 2011; see also Baer et al., 2006).

From a more practical perspective, the finding that the ACT workshop was influencing these two mindful skills supports the use of techniques that raise people's awareness of present moment physical sensations (e.g., by learning to shift one's attention into the body); as well as the various strategies ACT employs to help people notice that they do not have to react to, get caught up in, or be overly controlled by unhelpful cognitions,

urges, or emotions, which can instead come to be viewed as a natural part of the human condition (Flaxman et al., 2013).

When interpreting these findings, it is important to note several limitations in the design of the current study. Our sample size is relatively small, and our study provides only a pilot and snapshot evaluation of an ACT programme that was being delivered to larger numbers of employees within the host organisation. Although we were able to make use of a waiting list comparison group, participants were not randomly allocated to condition. This may detract from the study's internal validity. However, we found no significant differences between the ACT and control groups on any of the study variables. Our method of recruitment bore a close resemblance to how the staff support service operated, with employees being allocated to ACT workshops until they were full, and others placed on a waiting list and given dates for the next round of training in a few months' time. Thus, while the non-randomised design may reduce the study's internal validity, we believe the study exhibits strong external validity. By nesting the research within the routine clinical service, we hope to have addressed calls for evaluations of psychological interventions under usual service conditions (Barkham & Margison, 2007; Shadish et al., 2000).

The study design is further limited by the lack of an active control condition. As a result, any non-specific intervention effects were not controlled for. It is possible that the improvement in mental health in the ACT condition was partly attributable to feelings of group support, the interpersonal warmth of the therapist, or participants' own individual characteristics (e.g., motivation to change). In addition, the same therapist delivered all the ACT workshops being evaluated; thus, we cannot rule out the possibility that the therapist had particular skills or characteristics that may have influenced the outcomes.

Because the study focuses on only two assessment occasions, mediator and outcome variables were measured at the same point in time. A stronger demonstration of mediation

would need to show that hypothesised mediating variables are changing prior to change in the outcome. Thus, future studies of ACT in the workplace would benefit from having additional and repeated measurement occasions in the first few weeks following the workshop (cf. Arch, Wolitsky-Taylor, Eifert, & Craske, 2012; Gloster et al., 2017; Hayes, Orsillo, & Roemer, 2010).

Another limitation is that we focused primarily on ACT's mindfulness and acceptance processes, and not on the values and committed action elements of the ACT model. Although we included a general measure of psychological flexibility, we did not examine whether the ACT workshop resulted in an increase in employees' capacity to engage in values-based behaviour. Recent research has demonstrated that values-based action can function as an influential process of change during longer ACT treatments (Gloster et al., 2017). Hence, future studies of ACT in the workplace may benefit from including measures of values-based behavioural activation. Finally, we used a "proxy" measure to capture cognitive defusion (operationalised as degree of belief in negative thought content). Although other ACT researchers have used the ATQ-B for the same purpose (see Hayes et al., 2006 for a review), it would be useful to assess the impact of this type of ACT-based training on more recently developed measures of defusion (e.g., Gillanders et al., 2014).

Despite these methodological limitations, the present study provides some preliminary practice-based evidence that a brief ACT intervention can be effective in improving the mental health of distressed healthcare employees. It is encouraging that, when evaluated within a more routine clinical (staff support) service, ACT's beneficial influence on employees' mental health was found to be equivalent to that reported in previous worksite RCTs. In addition, we found some support for the notion that ACT's effects on mental health are transmitted (at least in part) via mindfulness and acceptance processes, and *not* via change in the form or frequency of negative cognitions. We hope that these promising findings

encourage other researchers to conduct evaluations of ACT-based interventions as they are being delivered in real-world practice settings.

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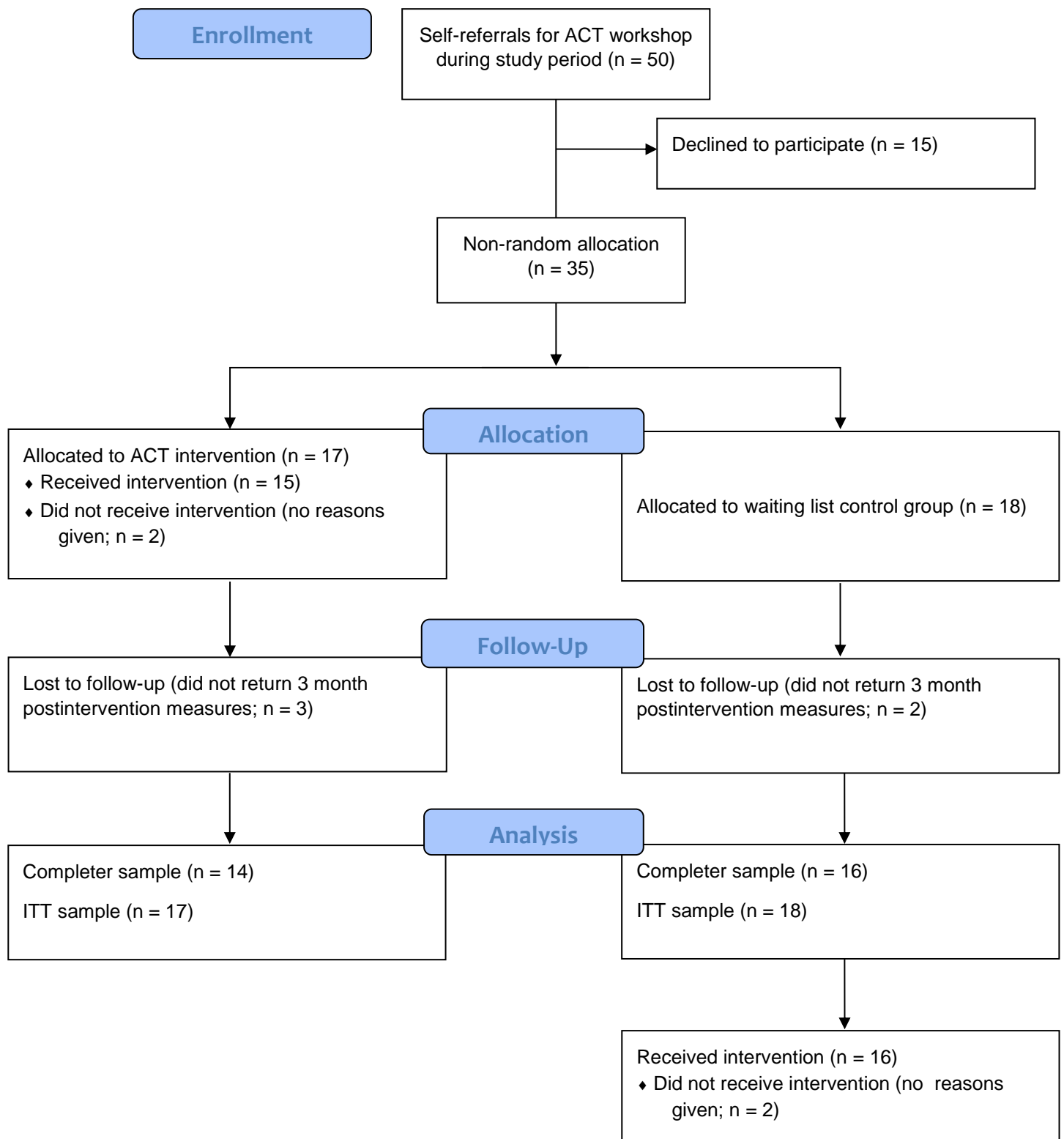
Figure 1. *Participant Flow*

Table 1

Completer Sample Baseline (Preintervention) Characteristics

	ACT	**Waitlist**	**Sample**
	(n = 15)	(n = 16)	(n = 31)
Age (*M* years/*SD*)	38.2 (10.4)	40.9 (9.0)	39.7 (9.6)
Gender (% female)	80%	88%	84%
Married/Partner (%)	60%	75%	68%
University degree (%)	80%	56%	68%
Nursing (%)	60%	63%	61%
Allied health professional (%)	27%	6%	16%
Non-clinical job role (%)	13%	31%	23%
Role Banding (median/range)	5 (4-7)	5 (2-8)	5 (2-8)
Years worked for org (*M* years/*SD*)	10.6 (10.8)	14.6 (9.1)	12.7 (10.0)

Table 2

Intention-to-Treat (ITT) Sample Means, Standard Deviations, and Between-Group Effects at Three Months Postintervention

	ACT (*n* = 17)		Control (*n* =18)		Between-Group Effects[a]		
	M	SD	M	SD	B	SE	*t*
Psychological distress							
Preintervention	21.71	5.29	20.28	6.94			
Postintervention	11.29	5.10	19.87	6.92	9.39	1.82	5.16***
Psych flexibility							
Preintervention	26.41	6.86	25.67	9.41			
Postintervention	32.58	9.0	25.73	8.99	-6.40	2.90	-2.20*
Mindfulness							
Preintervention	111.06	21.21	113.72	13.24			
Postintervention	124.70	19.23	111.74	13.45	-14.62	4.43	-3.30**
Cognitive fusion							
Preintervention	79.53	24.97	81.28	25.81			
Postintervention	61.18	30.42	79.51	31.78	16.54	7.72	2.14*
Negative cognitions							
Preintervention	76.35	26.26	79.44	23.69			
Postintervention	68.87	31.42	80.32	32.61	8.81	9.02	.98

Note. N = 35. Means and SDs were pooled across five imputations. [a]Pooled (unstandardized) regression coefficients (B) testing differences between the ACT and control group at 3 months postintervention, while controlling for preintervention scores.

*p < .05. **p < .01. ***p < .001.

Table 3

Bivariate Correlations Between Study Variables

Variable	1	2	3	4	5	6	7	8	9	10
1. Distress pre	-									
2. Distress post	.39	-								
3. Flexibility pre	-.61	-.39	-							
4. Flexibility post	-.26	-.59	.54	-						
5. Mindfulness pre	-.44	-.29	.43	.49	-					
6. Mindfulness post	-.24	-.57	.29	.65	.58	-				
7. Fusion pre	.25	.40	-.67	-.64	-.43	-.33	-			
8. Fusion post	.21	.51	-.54	-.77	-.47	-.58	.81	-		
9. Cognitions pre	.27	.37	-.62	-.54	-.38	-.28	.93	.77	-	
10. Cognitions post	.31	.43	-.45	-.70	-.51	-.62	.66	.86	.67	-

Note. Based on ITT data ($N = 35$). Correlations were pooled across five imputations. Distress = psychological distress (GHQ-12); flexibility = psychological flexibility (AAQ-II); mindfulness (FFMQ total score); fusion = cognitive fusion (ATQ-B); cognitions = frequency of negative cognitions (ATQ-F). Coefficients $\geq$ .37 in the ITT dataset were statistically significant.

Table 4

Bootstrapped Multiple Mediator Models Testing Indirect Effects of ACT on Employees'

Mental Health (GHQ-12)

	Bootstrap estimate		BCa 95% CI	
	Estimate	SE	Lower	Upper
Model 1				
Psychological flexibility (AAQ-II)	3.0	2.19	-.91	6.58
Negative cognitions (ATQ-F)	-.40	.88	-2.95	.72
Total indirect effect	2.60	1.78	-1.56	5.06
Contrast (AAQ-II vs. ATQ-F)	3.39	2.83	-1.65	8.64
Model 2				
Mindfulness (FFMQ)	**2.42**	**1.55**	**.42**	**7.21**
Negative cognitions (ATQ-F)	-.12	.93	-5.57	.56
Total indirect effect	**2.30**	**1.46**	**.02**	**5.75**
Contrast (FFMQ vs. ATQ-F)	**2.54**	**2.10**	**.17**	**9.89**
Model 3				
Cognitive fusion (ATQ-B)	-2.67	3.44	-9.86	3.27

Negative cognitions (ATQ-F)	1.77	2.97	-1.89	9.15
Total indirect effect	-.90	1.39	-3.76	2.02
Contrast (ATQ-B vs. ATQ-F)	-4.43	6.28	-18.50	4.51

Note. Preintervention scores on each variable were entered as covariates in each model.

BCa = bias corrected and accelerated confidence intervals. Results based on 5000 bootstrap

samples. Rows in bold indicate significant indirect effects or contrasts.

Table 5

Bootstrapped Multiple Mediator Model Testing Indirect Effects of ACT on Employees'

Mental Health (GHQ-12) via Observing and Nonreactivity

	Bootstrap estimate		BCa 95% CI	
	Estimate	SE	Lower	Upper
Observing	**1.72**	**1.18**	**.07**	**5.09**
Nonreactivity	**2.52**	**1.58**	**.12**	**6.45**
Negative cognitions (ATQ-F)	.20	.95	-2.52	1.41
Total indirect effect	**4.44**	**2.0**	**.66**	**8.27**
Contrast (observe vs. ATQ-F)	1.52	1.60	-.49	6.35
Contrast (nonreact vs. ATQ-F)	-2.32	1.81	-7.75	.10

Note. Preintervention scores on each variable were entered as covariates in each model.

BCa = bias corrected and accelerated confidence intervals. Results based on 5000 bootstrap

samples. Rows in bold indicate significant indirect effects or contrasts.