

## RESEARCH ARTICLE

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# A brief acceptance and commitment intervention for work-related stress and burnout amongst frontline homelessness staff: A single case experimental design series

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## Abstract

**Purpose:** Recent intervention research for burnout amongst those working in health and social care contexts has found acceptance and commitment therapy (ACT) interventions to be of use but has provided less clarity on the role of psychological flexibility (a key ACT construct). This study further evaluated the usefulness of ACT for burnout and work-engagement and assessed the role of psychological flexibility in contributing to therapeutic change.

**Procedure:** A nonconcurrent multiple-baseline across-participants single-case experimental design was used. Four participants were recruited from a homelessness organization in the East Midlands, England. The ACT-intervention was split into three modules to reflect the three aspects of the ACT triflex, and the sequence of delivery was randomized for each participant in order to test the relationship between these aspects.

**Findings:** Support was found for the ACT intervention reducing exhaustion and increasing work-engagement. Psychological Flexibility increased in all participants and was temporally related to increases in other outcome variables in some instances. Delivery of the intervention focussed on any given aspect of the ACT triflex could increase different domains of psychological flexibility.

**Implications:** This study adds to the growing body of research in favour of ACT interventions for burnout and adds to the understanding of psychological flexibility as a mediating variable.

## KEYWORDS

acceptance and commitment therapy, burnout, homelessness, psychological flexibility, work-engagement, work-related stress

## 1 | INTRODUCTION

Work-related stress is prevalent amongst staff working in health and social care settings (Schiff & Lane, 2019) and has deleterious effects

on the quality of care delivered (Teoh, Hassard, & Cox, 2019). Research has focussed on staff working in statutory mental health services; however, frontline workers in homelessness services are likely to face similar demands (Arslan, 2013; Schiff & Lane, 2019). Factors

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which are common to both roles include working with clients who are likely to be traumatized, have difficulty with emotional regulation, exhibit challenging behaviour and have low expectations of change (Jenkins, Rose, & Lovell, 1997; Maguire, Grellier, & Clayton, 2017; Schiff & Lane, 2019). Little empirical research has been conducted on frontline homelessness staff; however, one study into frontline workers in women's crisis shelters in the United States found that 20% of staff met the threshold for a 'high' level of burnout (Baker, O'Brien, & Salahuddin, 2007).

Front line staff working for homelessness organizations deliver a broad range of services; 'They are socialmentalhousinglifesupport [sic] workers' (Burley, 2019) for clients who are likely to have suffered a range of traumas (Hopper, Bassuk, & Olivet, 2010). Where such work-stressors are rife in other areas of social care, it is well established that these can lead to burnout, amongst other difficulties (Morse, Salyers, Rollins, Monroe-DeVita, & Pfahler, 2012). In addition to the personal impact on the well-being of frontline workers, burnout is known to have adverse impacts on the quality of interactions between staff and clients (Holmqvist & Jeanneau, 2006).

Burnout—a syndrome of features resulting from chronic work-related stress—was originally conceptualized as comprising three dimensions: emotional exhaustion, depersonalization of clients and a reduced sense of self-efficacy (Maslach, Jackson, Leiter, Schaufeli, & Schwab, 1986; Maslach & Leiter, 2016). Whether or not this three-dimensional model accurately reflects the constitution of burnout is debated. Although the originators of the concept maintain that burnout has a three-factor structure (Schaufeli, Leiter, & Maslach, 2009), others have argued that emotional exhaustion is the key construct and that depersonalization and reduced self-efficacy are both means of disengaging from work to protect one's emotional resources (Ferris et al., 2016; Rogala et al., 2016; Thanacoody, Newman, & Fuchs, 2014; Vaes & Muratore, 2013). Furthermore, others have questioned the underlying theoretical framework of the original conception of burnout (Shirom & Melamed, 2006). Indeed, to add to the confusion, empirical studies have found that workers in healthcare and other industries can feel simultaneously exhausted and yet maintain a high level of *engagement*—a sense of absorption and motivation—with their work (Korunka, Kubicek, Schaufeli, & Hoonakker, 2009; Peterson, Demerouti, Bergström, Asberg, & Nygren, 2008).

Fostering a focus on finding meaningful actions in one's work (such as frontline staff reporting high levels of engagement) in spite of difficult internal experiences (such as staff reporting emotional exhaustion or a reduced sense of self-efficacy) is consistent with the model underlying acceptance and commitment therapy (ACT). ACT is a third-wave behavioural intervention model, which seeks to enhance an individual's 'psychological flexibility' (PF), that is, their ability to undertake activity which is personally meaningful in spite of barriers in the form of troubling or difficult emotional or cognitive experiences (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). It is purported that PF can be cultivated using six ACT-processes, which themselves can be paired into three dyads (collectively known as the ACT triflex; Harris, 2009). The aspects of the triflex are commonly called 'being open', 'noticing' and 'being active'.

### Key Practitioner Message

- An ACT intervention for burnout amongst frontline homelessness workers was tested.
- Moderate support was found for ACT improving exhaustion and work-engagement.
- Changes in psychological flexibility were temporally related to some other outcomes.
- Aspects of the psychological flexibility triflex are distinguishable yet interrelated.

ACT-based interventions have been used in several studies with the aim of ameliorating burnout amongst direct-care workers. A recent systematic review and meta-analysis found these interventions to be most effective amongst those who reported higher levels of distress (a conceptually distinct construct from burnout) at commencement of the intervention, and the greatest improvement was in psychological distress, rather than for burnout (Reeve, Tickle, & Moghaddam, 2018). The magnitude of the effect for psychological distress was greatest at follow-up time points, rather than immediately postintervention. Again, this is consistent with the ACT model, which would expect a person's sense of well-being to increase over time, as they enact greater numbers of increasingly personally meaningful behaviours. In the context of frontline care delivery, this might include behaviours such as attending to a client's emotional difficulties in spite of the vicarious distress this causes for the worker, so long as this is aligned with the worker's values and is contextually appropriate. As such, a frontline worker plausibly may continue to experience exhaustion yet experience an improvement in their sense of work-engagement.

Curiously, despite the general support for ACT-based interventions found in this review (Reeve et al., 2018), the evidence did not support these improvements being mediated through increases in PF. This is at odds with the ACT-model, which would predict a change in PF acting as a precursor to behavioural change, which would then be reflected in an individual's emotional responses. It was suggested that the lack of evidence for this could be explained by the way that PF was measured in the studies captured by the review. To rigorously assess the potential mediating role of PF, the present study applies a single-case experimental design: Apt to examine process-outcome relationships over time, under systematic interventional control, at the level of the individual.

In summary, the extant research suggests that ACT-based interventions may be helpful for reducing distress in direct-care staff working in inpatient settings who are experiencing work-related stress, although the mechanism through which this works remains unclear. Although the nature of work stressors faced by frontline homelessness workers seems likely to be similar, this is an area which is yet to receive the research attention it deserves. This raises several questions which the present research aims to address. These questions are summarized in Table 1. Chiefly, the study aims to assess whether ACT intervention can improve outcomes relating to work-related stress and burnout, and whether any such improvements are attributable to ACT-targeted

**TABLE 1** Study aims, sources of evidence and hypotheses

Question	Sources of evidence	Hypothesis
1. Do the primary outcomes change? Are there changes in burnout or work-engagement?	Pre, post and follow-up long-form measures. Daily short-form exhaustion and work-engagement measures.	It is expected that following the intervention, exhaustion will reduce and work-engagement will increase. These will be tested for using a reliable change index.
2. Do the secondary outcomes change?		
Are there in changes in psychological wellbeing?	Pre, post and follow-up psychological wellbeing measures.	It is expected that psychological wellbeing will increase. This will be tested using a reliable change index.
Are there changes in the idiographic values scores?	Daily idiographic measure scores	It is expected that behavioural alignment with values will increase. This will be assessed visually.
3. Does the process variable change? Are there changes in PF?	Pre, post and follow-up long-form measures. Temporally related changes in daily short-form PF measures.	It is expected that PF will increase following the intervention. This will be tested for using a reliable change index.
4. Are outcome changes linked to process variable changes? Are any changes observed in the process variable linked to any changes observed in any of the three outcomes?	The temporal relationship between changes in the PF measure and changes in the outcome measures	It is expected that increases in PF will precede improvements in the daily outcome measures assessed by visual analysis
5. Do all aspects of PF change following the introduction of one discrete aspect of the intervention?	Differential sequencing of intervention components (i.e., the ACT triflex modules) between participants; daily PF measure with subscales mapping to each aspect of the ACT triflex.	No hypothesis.

changes in PF. Given the possible dissociation between exhaustion and work-engagement in this population (and consistent with the ACT separation of internal experiences and outward actions) these aspects of burnout are measured separately. Moreover, given the ACT focus on promoting well-being and personally meaningful behaviour, these outcomes are examined alongside burnout. With respect to PF, and its possible role as a mediator of outcomes, the study assesses whether ACT increases PF—including whether the three dyadic sub-processes of PF change in response to corresponding components of the ACT intervention—and whether changes in PF have temporal precedence over changes in focal outcomes.

## 2 | METHOD

Ethical approval was granted by the Faculty of Medicine and Health Sciences Research Ethics Committee at the University of Nottingham and informed written consent was obtained from each participant.

### 2.1 | Measures

The full versions of measures were administered at preintervention, postintervention and follow-up timepoints. Where a measure was administered daily, a short-form version was developed. Short-form versions were designed to be sufficiently brief to reduce participant burden.

#### 2.1.1 | Burnout

The Oldenburg Burnout Inventory (OLBI; Demerouti, Bakker, Vardakou, & Kantas, 2003) was chosen as a measure of burnout, as it is made up of two subscales: exhaustion and engagement. This is consistent with the ACT-model, which would predict an increase in work-engagement following the intervention, in spite of feelings of exhaustion, although exhaustion may also be expected to reduce secondarily to this.

The OLBI has been translated into English from German and has been shown to have satisfactory internal reliability, with Cronbach's alpha scores above .70 across a variety of populations and across time (Halbesleben & Demerouti, 2005). It has been demonstrated to have convergent validity with other measures of burnout (Demerouti et al., 2003; Halbesleben & Demerouti, 2005). The OLBI was used to determine eligibility using cut-off scores taken from Peterson et al. (2008).

The full 16-item version of the OLBI was administered each week, and a short-form version was administered daily. The full-form has eight items for each subscale with response range from 1 (strongly agree) to 4 (strongly disagree) for each item; the total is divided by eight to give an index score. The short-form consisted of one item from each scale (giving a total of two items, each acting as equivalent in scale to the index score on the full-form). The items with the highest factor loading within each scale were chosen to represent their respective subscale (factor loadings taken from Halbesleben & Demerouti, 2005).

Higher scores indicate greater exhaustion and higher disengagement for the respective subscale.

### 2.1.2 | Personal well-being

The personal well-being index (PWI; International Wellbeing Group, 2013) was chosen to assess broader domains of life-fulfilment. This measure consists of seven unipolar scales pertaining to an individual's satisfaction with different domains of their life and perceived national social milieu: Items are rated from 0–10, anchored at 0 = 'no satisfaction at all' and 10 = 'completely satisfied'. The individual items are known to correlate with social, financial and health variables, which suggests an appropriate degree of content validity. The internal reliability, as measured by Cronbach's alpha is between .70 and .85 (International Wellbeing Group, 2013).

This measure was administered weekly. As it was not used within the daily measures, no short-form version was developed.

Higher scores indicate greater psychological well-being.

### 2.1.3 | Psychological flexibility

The Comprehensive assessment of Acceptance and Commitment Therapy processes (CompACT; Francis, Dawson, & Golijani-Moghaddam, 2016) was chosen to measure PF for this study. This measure has subscales for each aspect of the ACT triflex (these are named slightly differently in this measure, but the names used in the introduction shall be used for consistency through this paper and because they are conceptually equivalent). The scale as a whole has a Cronbach's alpha of .91. It has a moderate overlap with measures of distress, suggestive of an appropriate level of divergent validity (i.e., it is measuring a distinct construct, but one which is thought to relate to distress), and was developed using a Delphi consensus which indicates it has appropriate content validity for its use as a measure of PF (Francis et al., 2016).

The full 23-item version of the CompACT was administered each week, and a short-form version was administered daily. Items are rated from 0 (strongly disagree) to 6 (strongly agree) around a neutral midpoint ([3] neither agree nor disagree) and summed to form three subscales (corresponding to 'being open' [10 items], 'noticing' [5 items] and 'being active' [8 items]) plus an overall total. The short-form consisted of one item from each subscale (giving a total of three items). The item with the highest factor loading within each scale was chosen to represent that scale (Francis et al., 2016).

Higher scores indicate lower PF.

### 2.1.4 | Idiographic personal values

In addition to the validated measures listed above, two further scales were used to measure how well a participant perceived their own behaviour as matching their personal values. Each participant was

asked to identify one personally meaningful value from their home context and one from their work context ('value' is defined here as having the same meaning as it would within the ACT model: a quality that an individual most wants to express in their daily behaviour). The following text was used with a Likert-scale:

These are your two personally meaningful values which you would like to meet in the way that you live your life. Each day, record how close your actions match what these values represent, on a scale of 1 to 5.

This scale (both items) was used in both the weekly and the daily versions of the measures.

## 2.2 | Design

To effectively answer the research questions, a nonconcurrent multiple-baseline across-participants single-case experimental design (SCED) was used. This was chosen to elicit the chronicity of any changes in the outcome or process variables; and to enable manipulation of the sequence of ACT-dyads between participants. As such, this can be described as an ABCDE design, where A is the baseline period (common to all SCED designs); B, C and D are the intervention phases; and E signifies the follow-up point. The intervention phases of B, C and D each represent one ACT-dyad intervention (the sequence of which was randomly varied between participants). Finally, the long-form measures were administered at a follow-up point 4 weeks after the final intervention stage (phase E).

## 2.3 | Recruitment

Participants were recruited from an organization in the East Midlands in the United Kingdom delivering support to people experiencing homelessness, most often alongside multiple complex needs, that is, substance misuse, mental health problems and/or offending. The project was advertised in team meetings and to members of staff through personal communication by the second author (AT). Some participants worked in temporary accommodation settings (i.e., hostels) and others providing an outreach service. A minimum of three demonstrations (i.e., three participants) is thought to be required for establishing an effect in SCED research (Lane & Gast, 2014), and so a recruitment target of three to six participants was set.

The eligibility criteria were as follows:

1. Employed as a frontline member of staff for the above organization;
2. Aware of and able to meet the time commitment for the intervention and questionnaire measures;
3. Access to the internet to complete the measures;
4. Not on long-term sick leave.

5. A score on the OLBI indicating burnout within either of the subscales (i.e., either exhaustion [requiring a score of  $\geq 2.25$ ] or work-disengagement [requiring a score of  $\geq 2.1$ ] using scores taken from Peterson et al., 2008).

## 2.4 | Intervention

The ACT-intervention was delivered in a series of one-to-one 'workshop'-style sessions modelled on a psychological skills training course developed by Flaxman and McIntosh (2018) but organized so that each of the three sessions focussed on a discrete ACT-triflex component (see Table 2). Consistent with the ACT-model, the workshops were designed to be experiential rather than didactic (Hayes, 2004) and were delivered by the lead author (AR), a trainee clinical psychologist at the time that the research was undertaken with a special interest in ACT. The sessions lasted between 75–90 min and took place at the participants' respective place of work. The one-to-one sessions were recorded, and a stratified sample fidelity checked by the second author (NM) using the ACT-fidelity measure (O'Neill, Latchford, McCracken, & Graham, 2019). This measure awards points for

ACT-consistent behaviours and deducts points for ACT-inconsistent behaviours on the part of the person delivering the intervention. This was adapted to more heavily weight behaviours associated with the triflex being assessed within a particular session than for the other aspects of the triflex. This was achieved by multiplying the scores (for both ACT-consistent and ACT-inconsistent behaviours) for the items related to the aspect of the triflex in question by a factor of three.

## 2.5 | Procedure

Phase A, the baseline period, was planned to last a minimum of 5 data-points in order to be able to judge the presence (or absence) of stability, a necessary condition to be able to draw causal conclusions about the introduction of the intervention. Stability in the daily (short-form) measures of both subscales of the OLBI was deemed necessary to meet this criteria; stability was defined independently of trend (i.e., direction of preexisting change). The intervention phase was only triggered when stability was observed in the baseline (Lane & Gast, 2014; Wolery & Harris, 1982). Phases B, C and D were each delineated by the delivery of one ACT-triflex intervention module at their beginning. There were 2 weeks between the delivery of each intervention (except for participant 3, where one of the interventions was delayed by a week due to personal circumstances). Each participant was allocated to an intervention sequence of the ACT dyads by randomly selecting from a list of the potential available sequences. Table 3 indicates the sequence of the intervention phases for each participant. Table 4 displays the measurement time points for both full-form and short-form measures.

## 2.6 | Analysis

Analysis of the data took two approaches. First, within-participant analyses were conducted on any changes between preintervention, postintervention and follow-up time points. These were conducted on each full-form measure (i.e., the OLBI subscale for exhaustion, the OLBI subscale for engagement, the PWI and the CompACT). The analyses used the reliable change index (RCI; Jacobson & Truax, 1991). Clinically significant change analyses are often used in intervention research, but due to the lack of an appropriate dataset and that burnout is not viewed as a clinical entity in the United Kingdom, these were not felt to be suitable in this study. The RCI method of analysis was intended to provide a robust and quantifiable answer to the question of if the variables of interest underwent change. The RCI is suitable for calculating the magnitude of change (relative to the mean score, standard error and possible range of a measure) for individual participants, and so was used to establish the presence (or otherwise) of an effect.

Second, the daily measures were visually analysed following guidance provided by (Kazdin, 2019). Visual analysis is the most common method for analysing SCED data (Ledford, Barton, & Zimmerman, 2019) and utilizes data points plotted on a graph and joined by a 'celeration line'. Graphing freeware courtesy of

**TABLE 2** Session plan for each ACT-dyad and corresponding CompACT subscale

Session name	Targeted ACT-processes; corresponding CompACT subscale	Brief description of session content
Being open	Acceptance and defusion	'Being open' defined as 'relating skilfully to "unhelpful" thoughts', quicksand metaphor, 'costs of avoidance' worksheet, passengers on the bus metaphor, home practice plan.
Noticing	Present moment awareness and self-as-context	Mindful eating of a raisin exercise, mindfulness psychoeducation, body and breath meditation practice, 'discovering the self' exercise, home practice plan.
Being active	Values identification and committed action	Values defined as 'the personal qualities we most want to express in our daily behaviour', values compass worksheet, identifying barriers to action and how to overcome these, passengers on the bus metaphor, home practice plan.

Note. All the metaphors cited above were taken from Stoddard and Afari (2014).

**TABLE 3** Sequence of ACT-triad intervention sessions for each participant

Session	Participant 1	Participant 2	Participant 3	Participant 4
1	Being open	Noticing	Being active	Being active
2	Noticing	Being active	Being open	Being open
3	Being active	Being open	Noticing	Noticing

**TABLE 4** Outline of when outcome measures were administered and the timing of intervention

Measure	Preintervention	Baseline (Phase A) minimum 5 days	Intervention (workshop took place on first day of each phase)			
			Phase B (14 days)	Phase C (14 days)	Phase D (7 days)	4-week follow-up
OLBI full	✓	-	-	-	At end of phase	✓
OLBI short-form	-	Daily	Daily	Daily	Daily	-
Personal wellbeing index	✓	-	-	-	At end of phase	✓
CompACT full	✓	-	-	-	At end of phase	✓
CompACT short-form	-	Daily	Daily	Daily	Daily	-
Idiographic behaviour measure	✓	Daily	Daily	Daily	Daily	✓

Pustejovsky (n.d.) was used. Four characteristics of the data were assessed to ascertain the presence of an effect: change in the mean score between phases, change in the trend (slope) of the celeration line, shift in the level (an abrupt change in magnitude) and the latency of change (the elapsed period of time between the introduction of any of the interventions and a change in the characteristic being analysed; Kazdin, 2019). The more of these characteristics present, the more compelling the case that a functional relationship exists between the intervention and the dependent variable, although the consistency of a change in the data was valued over a change in the magnitude of the short-form measures (Ledford et al., 2019). As such, visual analysis of the daily short-form data was used to establish a causal relationship; the RCI scores—being based on full-length questionnaires with greater psychometric properties and therefore precision—were used to assess the presence of an effect.

As an adjunct to visual analysis of data from daily measures, simulation modelling analysis (SMA; Borckardt et al., 2008) was used to generate effect sizes and autocorrelation adjusted *p* values related to (a) the mean difference between phases (reported as Cohen's *d*) and (b) cross-correlations between process (PF) and outcome measures (reported as Pearson's *r*). This approach generates fewer Type I and Type II errors than visual data inspection (Borckardt et al., 2008). SMA simulates 5000 data-streams, with the same autocorrelation and *n* as the observed data, drawn randomly from a null distribution of data-streams. Finally, SMA produces a *p* value for the observed effect: Representing the empirical probability of observing an effect of equal or greater magnitude in a null distribution of data-streams (with matched properties, in terms of *n* and autocorrelation).

Within SMA, analyses of mean differences between phases were conducted by correlating the repeated dependent variable (process or outcome score) with a phase vector consisting of 1 *s* for the focal intervention phase and 0 *s* for all preceding datapoints ('baseline'). Analyses of process-outcome correlations primarily focussed on the magnitude and autocorrelation-adjusted significance of concurrent (same-day) relationships between PF (CompACT total) and outcome scores. We limited these analyses to CompACT total scores (rather than subscale scores) to reduce the number of process-outcome correlations tested (and likelihood of spurious results). However, to gain a sense of temporal precedence (whether changes in PF process scores precede changes in outcome, as would be consistent with theory, or vice-versa), we additionally examined the strength of cross-lag correlations: specifically, (1) whether CompACT total scores are predictively associated with next-day outcome scores, and (2) whether outcome scores are predictively associated with next-day CompACT total scores (i.e., the reverse effect). Cross-lag correlations were tested for each of the four daily outcomes (home values, work values, disengagement and exhaustion). Given the number of cross-lag relationships being tested, we focussed on estimating effect-sizes (*rs*) averaged across participants (versus individual-level *p* values) for these analyses.

For interpretation of Cohen's *d* (<0.20 = 'negligible', 0.20 = 'small', 0.50 = 'medium', 0.80 = 'large'; Cohen, 1992) estimates were considered to be 'similar' if differences were <.20 (i.e., of negligible size); differences  $\geq .20$  were interpreted as substantive. Equivalently, for *r* (<.10 = 'negligible', .10 = 'small', .30 = 'medium', .50 = 'large'), estimates were considered similar if <.10 and substantively different if  $\geq .10$ .

**TABLE 5** Full-form outcome measure results

		OLBI De	OLBI Ex	PWI	CompACT
Participant 1	Pre-	2.75	3.375	45	63
	Post-	2.125	2.125	56	27
	Follow-up	-	-	-	-
Participant 2	Pre-	3.375	3.25	40	69
	Post-	2.5	2.75	49	23
	Follow-up	2.5	2.75	53	28
Participant 3	Pre-	3.75	3.5	16	100
	Post-	3.625	3.25	23	81
	Follow-up	3.375	3	25	98
Participant 4	Pre-	2.25	4	28	58
	Post-	2.25	3.125	35	52
	Follow-up	1.125	3	40	45

Abbreviations: OLBI De, OLBI disengagement scale, higher scores indicated greater disengagement/lower engagement; OLBI Ex, OLBI exhaustion scale, high scores indicate greater exhaustion; PWI, personal well-being index, higher scores indicate greater wellbeing; CompACT, comprehensive assessment of acceptance and commitment therapy processes, lower scores indicate greater psychological flexibility.

**TABLE 6** Reliable change indices for each participant for the OLBI exhaustion and disengagement scales, the PWI and the CompACT

		Measure (RCI score; ✓ indicates reliable change)						
		OLBI De		OLBI Ex		PWI	CompACT	
Participant 1	Pre-post	-2.43	✓	-5.42	✓	1.61	-5.73	✓
	Post-follow up	-		-		-	-	
	Pre-follow up	-		-		-	-	
Participant 2	Pre-post	-3.40	✓	-2.17	✓	1.32	-7.32	✓
	Post-follow up	0.00		0.00		0.59	0.79	
	Pre-follow up	-3.40	✓	-2.17	✓	1.91	-6.53	✓
Participant 3	Pre-post	-4.89	✓	-1.08		1.03	-3.02	✓
	Post-follow up	-0.97		-1.08		0.29	-2.71	✓*
	Pre-follow up	-1.46	✓	-2.16	✓	1.32	-0.32	
Participant 4	Pre-post	0.00		-3.79	✓	1.03	-0.96	
	Post-follow up	-0.49		-0.54		0.73	-1.11	
	Pre-follow up	-0.49		-4.33	✓	1.76	-2.07	✓

Note. Change is considered reliable where the RCI score is >1.96. RCI scores are shown to two decimal places; \* indicates that although change was reliable, it was in an unfavourable direction; - indicates that missing data prevented the calculation of this score.

### 3 | RESULTS

No unusual or adverse events occurred during the study. Fidelity checking of the intervention sessions found a high level of adherence to the ACT therapeutic style and content, demonstrated by scores on the ACT-FM of between 22 and 24 out of a total possible score of 24.

#### 3.1 | Participants

Four people volunteered for the study, all of whom met the eligibility criteria. Limited participant characteristics are presented here to

maintain the confidentiality of those who took part (Tate et al., 2016). All participants were female and had worked in frontline roles for seven to 20 years. Two were support development workers and two assistant managers.

#### 3.2 | Reliable change indices

The full-form measures results are presented in Table 5; follow-up scores for participant 1 are missing. The reliable change index of the OLBI Exhaustion scale and disengagement scale, the PWI and the CompACT is presented in Table 6 for all three timespans (i.e., pre-post

intervention, post-follow up and pre-follow up). All participants demonstrated a reliable improvement in Exhaustion over at least one timespan. All participants except participant 4 demonstrated a reliable improvement in disengagement over at least one timespan. No participants showed a reliable change in the PWI over any time span. All participants demonstrated a reliable improvement in PF across at least one timespan, although in the case of participant 3, the improvement which occurred between preintervention and postintervention almost entirely reversed between postintervention and followup.

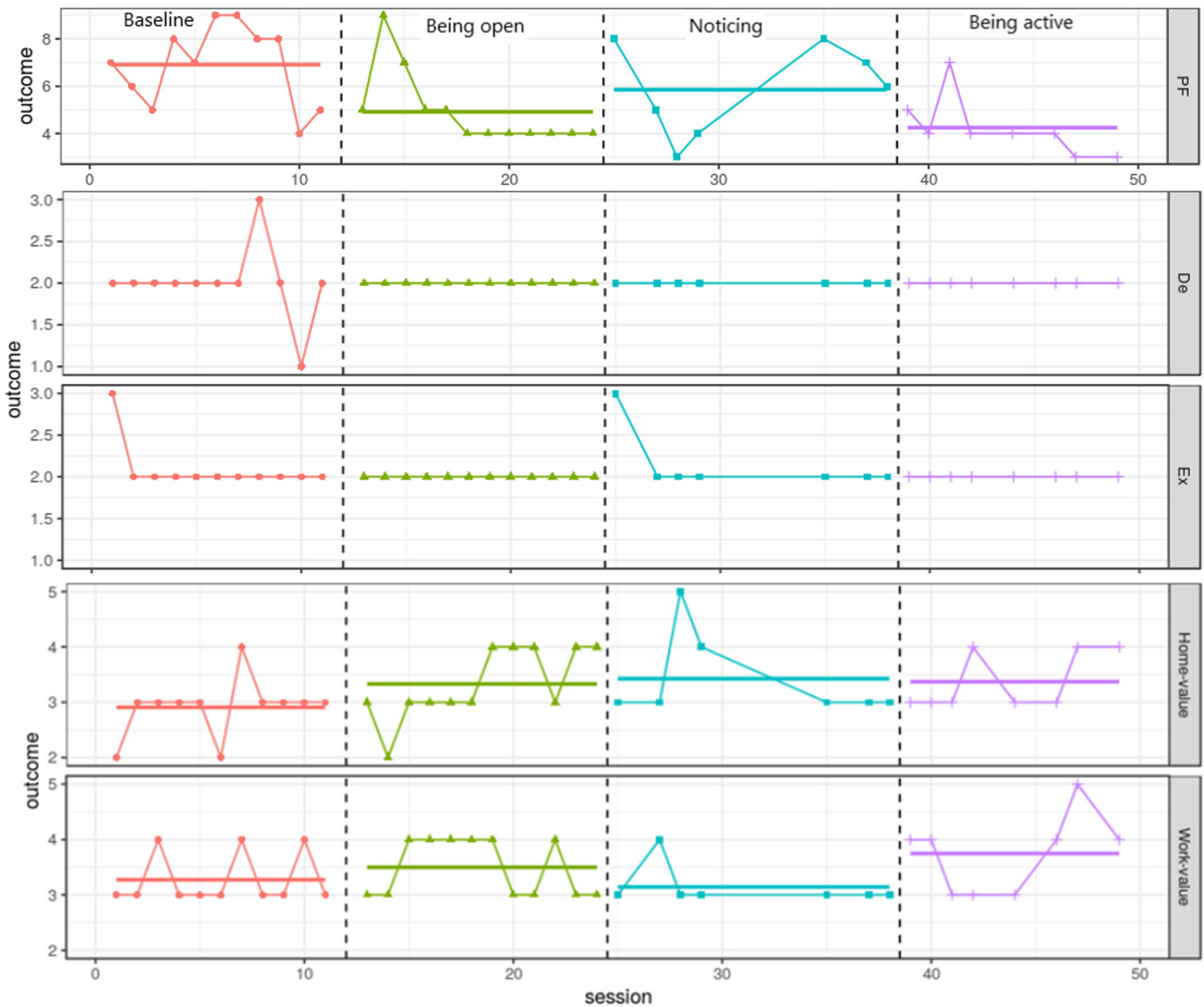
### 3.3 | Q1, 2 and 3: Visual analyses of the daily short-form measures

Graphs containing the datapoints for each daily measure are presented below, grouped by participant (Figures 1, 2, 3 and 4). Mean lines

are shown for each phase, and phases are delineated by vertical dotted lines. Please note that the graph for the CompACT has been placed at the top of each participant's set of graphs—differing from the previous order of description—in order to aid analysis relating to question 4.

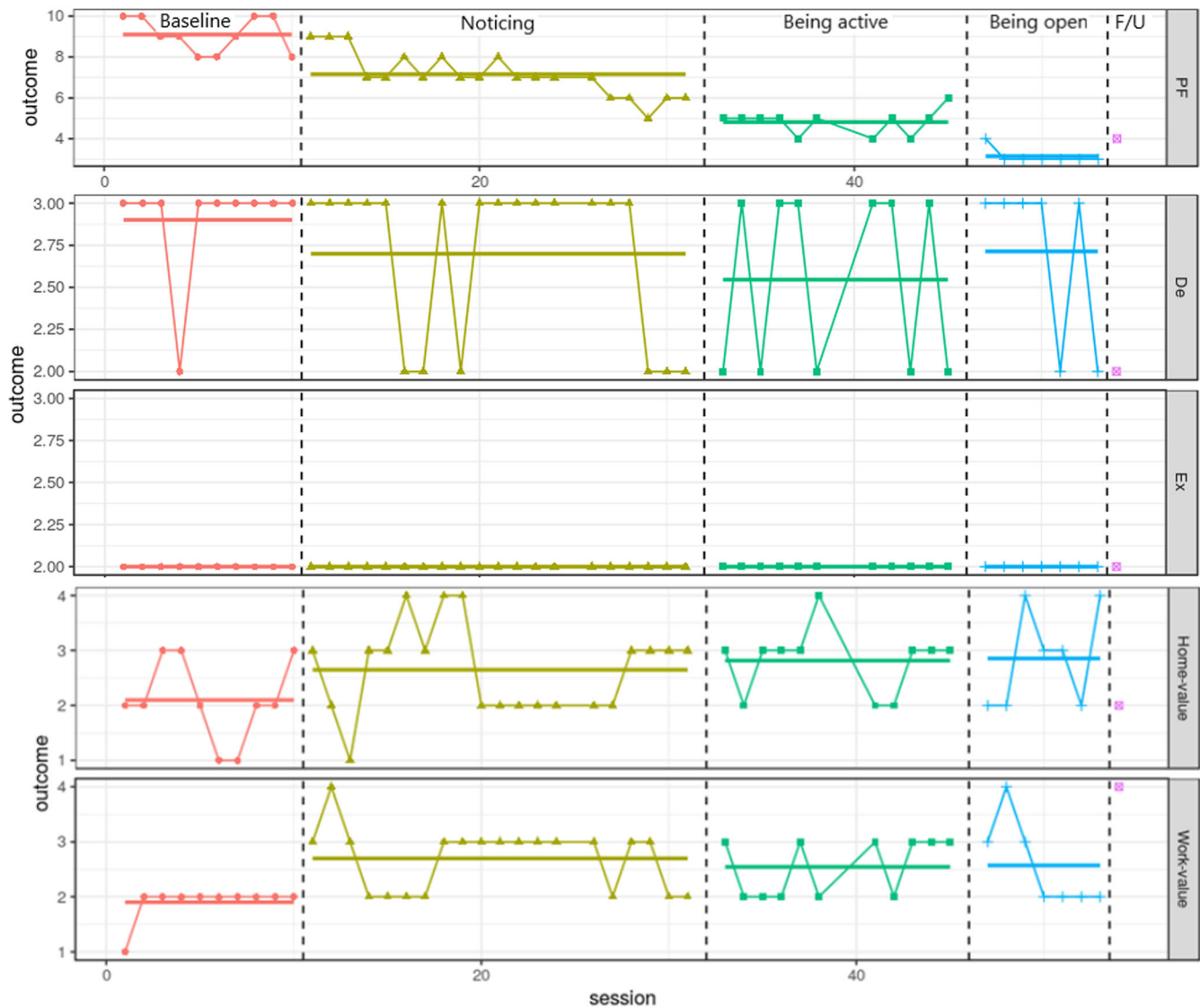
All participants exhibited stability in both OLBI subscales during the baseline phase, thus meeting the criteria for commencing the intervention phases. The baseline phases ranged from 5–12 days.

As can be seen in the graphs, a number of data points are missing. This is particularly true of participant 1 in Phase C (7 missing data points) and at follow-up. Please note that the y-axis of each graph has been scaled to fit each participant's responses, so what appears to be a large variation in scores may represent only one interval. The results of the visual analyses are for each characteristic of assessment are summarized in a table for each participant (Tables 7, 8, 9 and 10).



**FIGURE 1** Data points for participant 1 for each daily measure. Shaded bars on the right of each graph denote the data being presented: PF is PF, that is, the CompACT; De is the disengagement scale of the short-form OLBI; Ex is the exhaustion scale of the short-form OLBI; home-value and work-value are the idiographic values for home and work respectively. Each phase is labelled in the top graph





**FIGURE 2** Data points for participant 2 for each daily measure

### 3.4 | Q4: Assessing for any association between the outcome and process variables

#### 3.4.1 | Participant 1

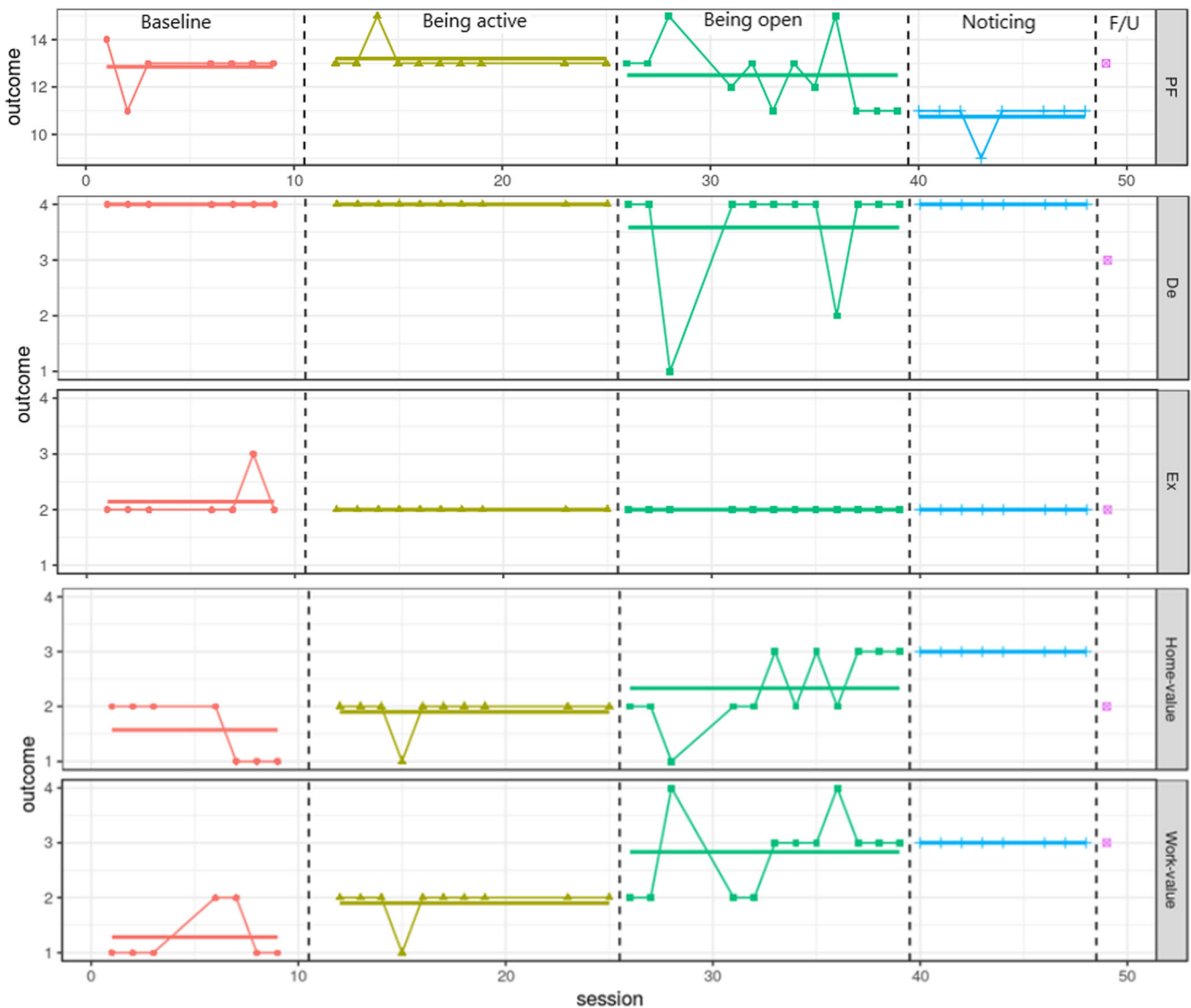
Examining concurrent (same-day) correlations between daily CompACT (PF) and outcome scores, improvements in total CompACT scores were strongly associated with improvements in home value scores ( $r = -.59, p < .001$ ) and moderately associated with improvements in work value scores ( $r = -.38, p = .016$ ). Daily disengagement and exhaustion scores were relatively flat (despite changes detectable in the long-form measures of these variables) and CompACT associations with these outcomes were correspondingly weaker and nonsignificant (respectively,  $r = .25, p = .075$ ;  $r = .25, p = .056$ )—although relationships were in the expected direction (positively correlated improvements).

#### 3.4.2 | Participant 2

There were moderate-to-small nonsignificant associations between improvements in total CompACT scores and improvements in home ( $r = -.30, p = .058$ ) and work ( $r = -.23, p = .101$ ) value scores. There was a small but (adjusting for observed autocorrelation) statistically significant association between improving CompACT and disengagement scores ( $r = .26, p = .039$ ). Daily exhaustion scores were constant, so associations were not estimable for this outcome.

#### 3.4.3 | Participant 3

Improvements in total CompACT scores were strongly and significantly associated with improvements in home value scores ( $r = -.74, p < .001$ ) but only demonstrated a small, nonsignificant correlation



**FIGURE 3** Data points for participant 3 for each daily measure

with improvements in work value scores ( $r = -.25$ ,  $p = .104$ ). Unexpectedly, improvements in CompACT scores were moderately and significantly associated with deterioration in disengagement for this participant ( $r = -.47$ ,  $p = .002$ )—likely reflecting changes in the final intervention phase (noticing) wherein PF improved sharply alongside a reversion of preceding improvements in disengagement. There was a negligible nonsignificant association between CompACT and Exhaustion scores ( $r = .08$ ,  $p = .299$ ) albeit in the expected direction.

### 3.4.4 | Participant 4

There was a negligible, nonsignificant association between improvements in total CompACT scores and improvements in home value scores ( $r = -.01$ ,  $p = .476$ ). Conversely, improvements in CompACT scores were significantly and moderately associated with improvements in Work Values scores ( $r = .36$ ,  $p = .027$ ). Disengagement scores

were constant, so associations were not estimable for this outcome. There was a small, non-significant association between improving CompACT and Exhaustion scores ( $r = .23$ ,  $p = .122$ ).

### 3.4.5 | Aggregated cross-lag correlations

Across outcomes, there were only negligible differences ( $<.10$ ) when comparing cross-lag correlations between (1) psychological flexibility and next-day outcomes versus (2) outcomes and next-day psychological flexibility: home values (average  $r$ s =  $-.29$  vs.  $-.23$ ), work values ( $-.22$  vs.  $-.30$ ), disengagement (.12 vs. .18) and exhaustion (.16 vs. .14). Averaged associations were of small-to-moderate magnitude and suggested bidirectional process-outcome relationships, with no clear pattern in terms of temporal precedence of changes. All relationships were of expected valence, such that improvements in PF were associated with improvements in outcomes.

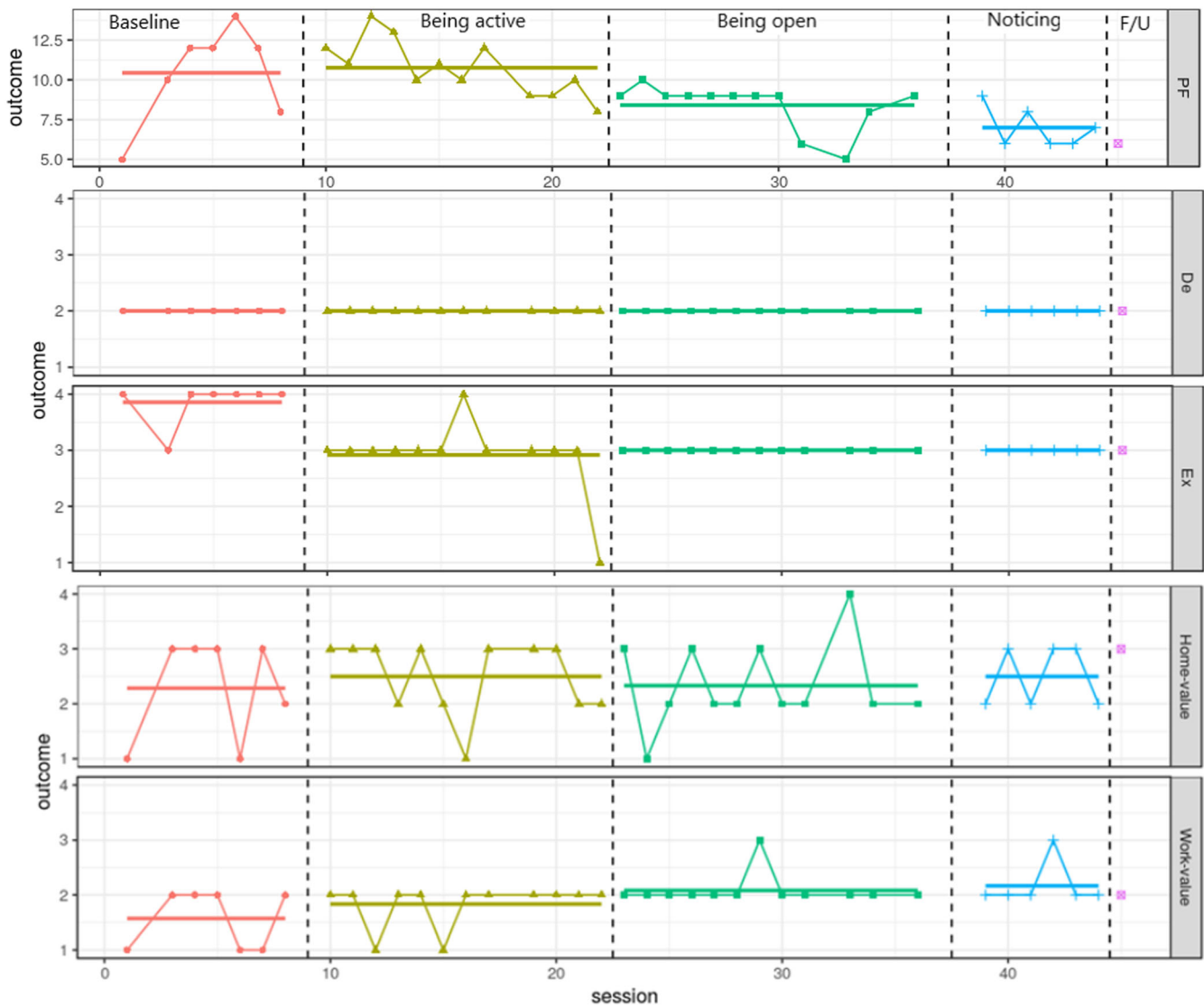


FIGURE 4 Data points for participant 4 for each daily measure

TABLE 7 Summary of analysis of daily short-form data for participant 1

Measure	Presence of characteristic					Overall effect-size ( <i>d</i> )
	Lack of variability	Change in mean scores	Change in trend	Change in level	Latency of effect	
OLBI disengagement	✓	X	X	X	X	0.00
OLBI exhaustion	✓	X	X	X	X	-0.22
Home value	~	✓	X	X	X	0.71*
Work value	~	X	X	X	X	0.35
CompACT	X	✓	X	~	~	-1.09*

Note. X = criteria not met; ~ = criteria possibly or partially met; ✓ = criteria met. Overall effect-size ES (effect size) reflects the standardised mean difference between intervention (Phases B–D) and baseline (Phase A).

\*Autocorrelation-adjusted *p* < .05.

**TABLE 8** Summary of analysis of daily short-form data for participant 2

Measure	Presence of characteristic					Overall effect-size ( <i>d</i> )
	Lack of variability	Change in mean scores	Change in trend	Change in level	Latency of effect	
OLBI disengagement	✓	~	X	~	✓	-0.46
OLBI exhaustion	✓	X	X	X	X	0.00
Home value	~	✓	X	X	X	0.67
Work value	✓	✓	X	✓	✓	1.10 <sup>*</sup>
CompACT	~	✓	X	✓	✓	-1.67 <sup>*</sup>

Note. X = criteria not met; ~ = criteria possibly or partially met; ✓ = criteria met. Overall effect-size ES (effect size) reflects the standardised mean difference between intervention (Phases B–D) and baseline (Phase A).

<sup>\*</sup>Autocorrelation-adjusted  $p < .05$ .

**TABLE 9** Summary of analysis of daily short-form data for participant 3

Measure	Presence of characteristic					Overall effect-size ( <i>d</i> )
	Lack of variability	Change in mean scores	Change in trend	Change in level	Latency of effect	
OLBI disengagement	✓	X	X	X	X	-0.33
OLBI exhaustion	✓	X	X	X	X	-0.57
Home value	✓	✓	X	X	X	1.05 <sup>*</sup>
Work value	✓	✓	X	✓	✓	1.61 <sup>*</sup>
CompACT	✓	✓	~	✓	~	-0.68

Note. X = criteria not met; ~ = criteria possibly or partially met; ✓ = criteria met. Overall effect-size ES (effect size) reflects the standardised mean difference between intervention (Phases B–D) and baseline (Phase A).

<sup>\*</sup>Autocorrelation-adjusted  $p < .05$ .

**TABLE 10** Summary of analysis of daily short-form data for participant 4

Measure	Presence of characteristic					Overall effect-size ( <i>d</i> )
	Lack of variability	Change in mean scores	Change in trend	Change in level	Latency of effect	
OLBI disengagement	✓	X	X	X	X	0.00
OLBI exhaustion	✓	✓	X	✓	✓	-1.39 <sup>*</sup>
Home value	X	X	X	X	X	-0.04
Work value	~	✓	X	X	X	0.71 <sup>*</sup>
CompACT	X	✓	~	✓	X	0.70

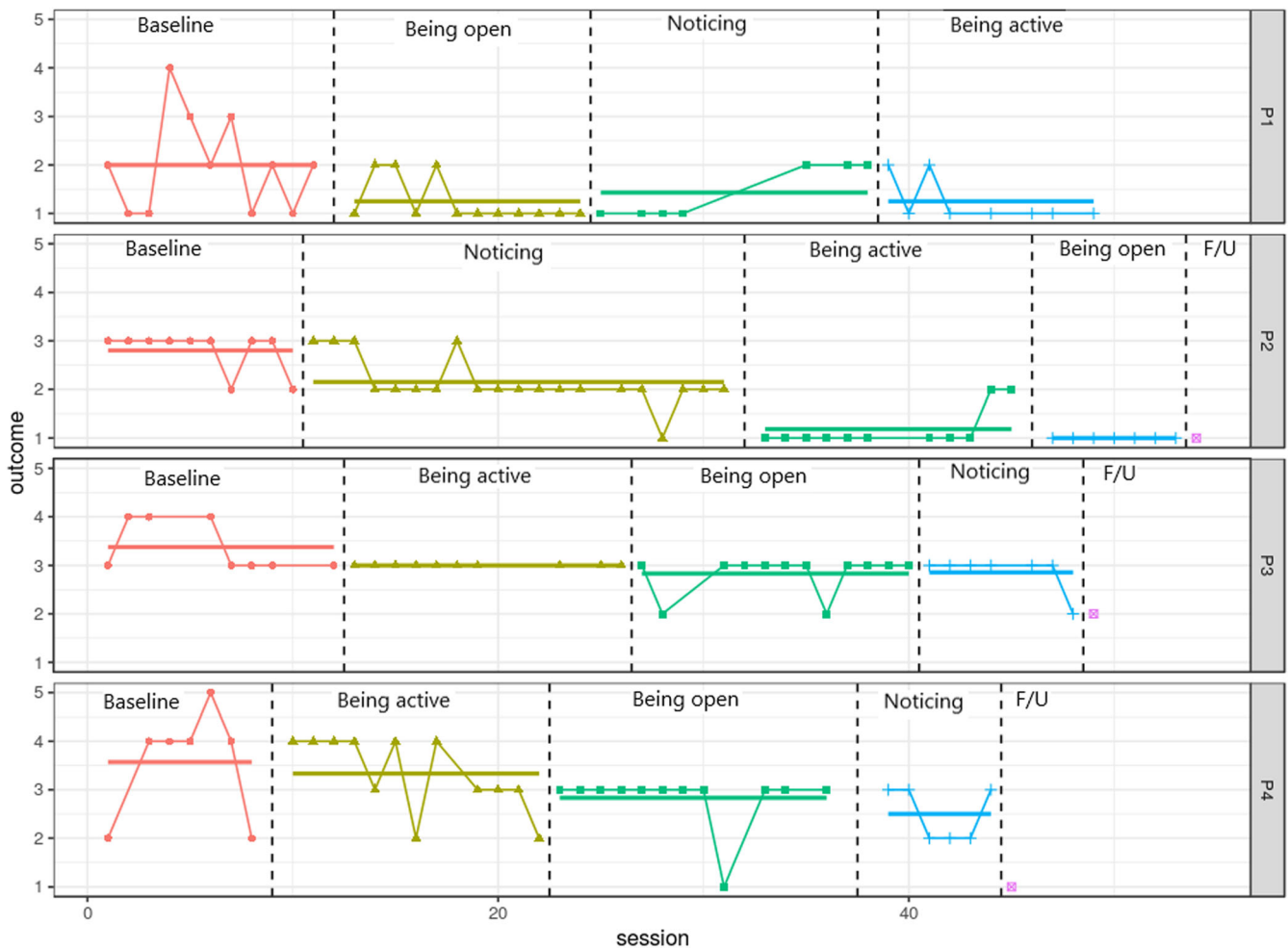
Note. X = criteria not met; ~ = criteria possibly or partially met; ✓ = criteria met. Overall effect-size ES (effect size) reflects the standardised mean difference between intervention (Phases B–D) and baseline (Phase A).

<sup>\*</sup>Autocorrelation-adjusted  $p < .05$ .

### 3.5 | Q5: Analysis of the sequence of the intervention on all three CompACT subscales

The impact on all three CompACT subscales of the different ACT-intervention modules was visually analysed. These are presented

separately for each subscale. Overall, collapsing across subscales, the effect of intervention was similar when introducing corresponding ( $d = -0.57$ ) and noncorresponding ( $d = -0.63$ ) modules—that is, there was no evidence, at an aggregated level, for the process-specificity of intervention components (indeed, there



**FIGURE 5** Graph of the CompACT being open subscale short-form for each participant, with intervention content labelled for each phase

was a negligible difference [ $d = 0.06$ ] favouring effects on non-targeted processes).

### 3.5.1 | Being open subscale

Across participants, there was a moderate effect of the being open intervention module on the corresponding subscale of the CompACT ( $d = -0.71$ ). However, this subscale demonstrated similar sensitivity to the noticing module ( $d = -0.61$ ) and appeared to show relatively elevated sensitivity to the being active module ( $d = -0.81$ ; a large effect). The clearest intervention-process correspondence (Figure 5) was observed for participant 1 ( $d = -1.03$ ) but the strongest effects, observed for participant 2, coincided with the noticing and being active modules ( $ds -1.35$  and  $-1.76$ , respectively).

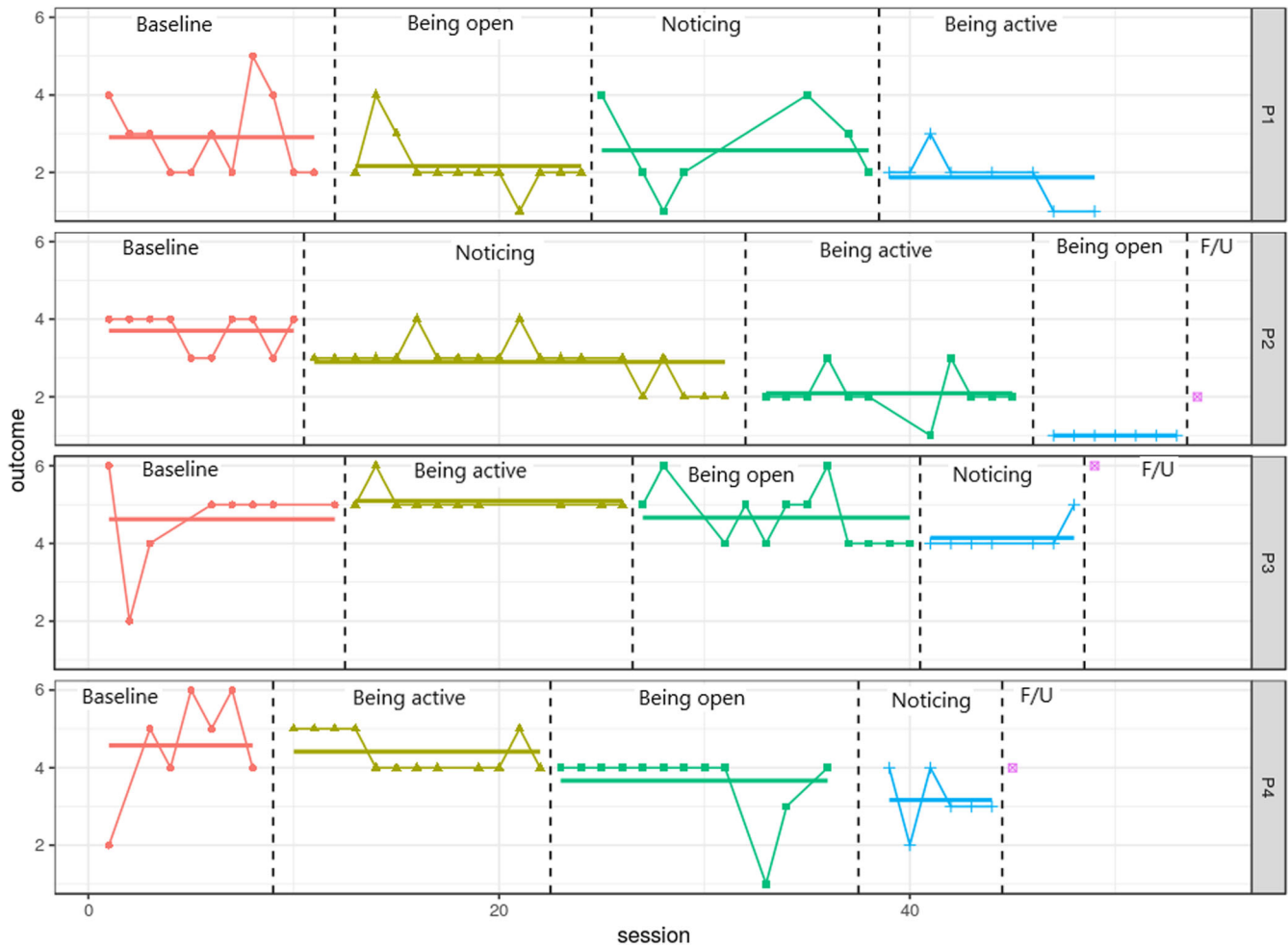
### 3.5.2 | Noticing subscale

Across participants, there was a large effect of the Noticing intervention module on the corresponding subscale of the CompACT

( $d = -0.81$ ). This subscale demonstrated similar sensitivity to the being open module ( $d = -0.71$ ; a moderate effect) and relatively reduced sensitivity to the being active module ( $d = -0.48$ ; a small effect). The clearest intervention-process correspondence (Figure 6) was observed for participant 2 ( $d = -1.47$ ), and this was also the strongest effect on noticing.

### 3.5.3 | Being active subscale

Across participants, there was a small effect of the being active intervention module on the corresponding subscale of the CompACT ( $d = -0.30$ ). This subscale demonstrated greater sensitivity to the 'being open' module ( $d = -0.60$ ; a medium effect) and greatest sensitivity to the 'noticing' module ( $d = -0.82$ ; a large effect). The clearest intervention-process correspondence (Figure 7) was observed for participant 2 ( $d = -1.18$ ), but the strongest effect on being active (observed for participant 3) coincided with the 'noticing' module ( $d = -1.42$ ). Unexpectedly, participant 4 demonstrates a deterioration between the baseline and the first intervention phase—'being active' ( $d = 0.65$ )—which would be expected to have the greatest positive



**FIGURE 6** Graph of the CompACT behavioural awareness subscale short-form for each participant, with intervention content labelled for each phase

impact on this measure of all the interventions given its content. Following this however, there is evidence of a continuous improvement through each stage of the intervention (with large effects of introducing the ‘being open’ [ $d = -0.86$ ] and ‘noticing’ [ $d = -0.85$ ] modules).

## 4 | DISCUSSION

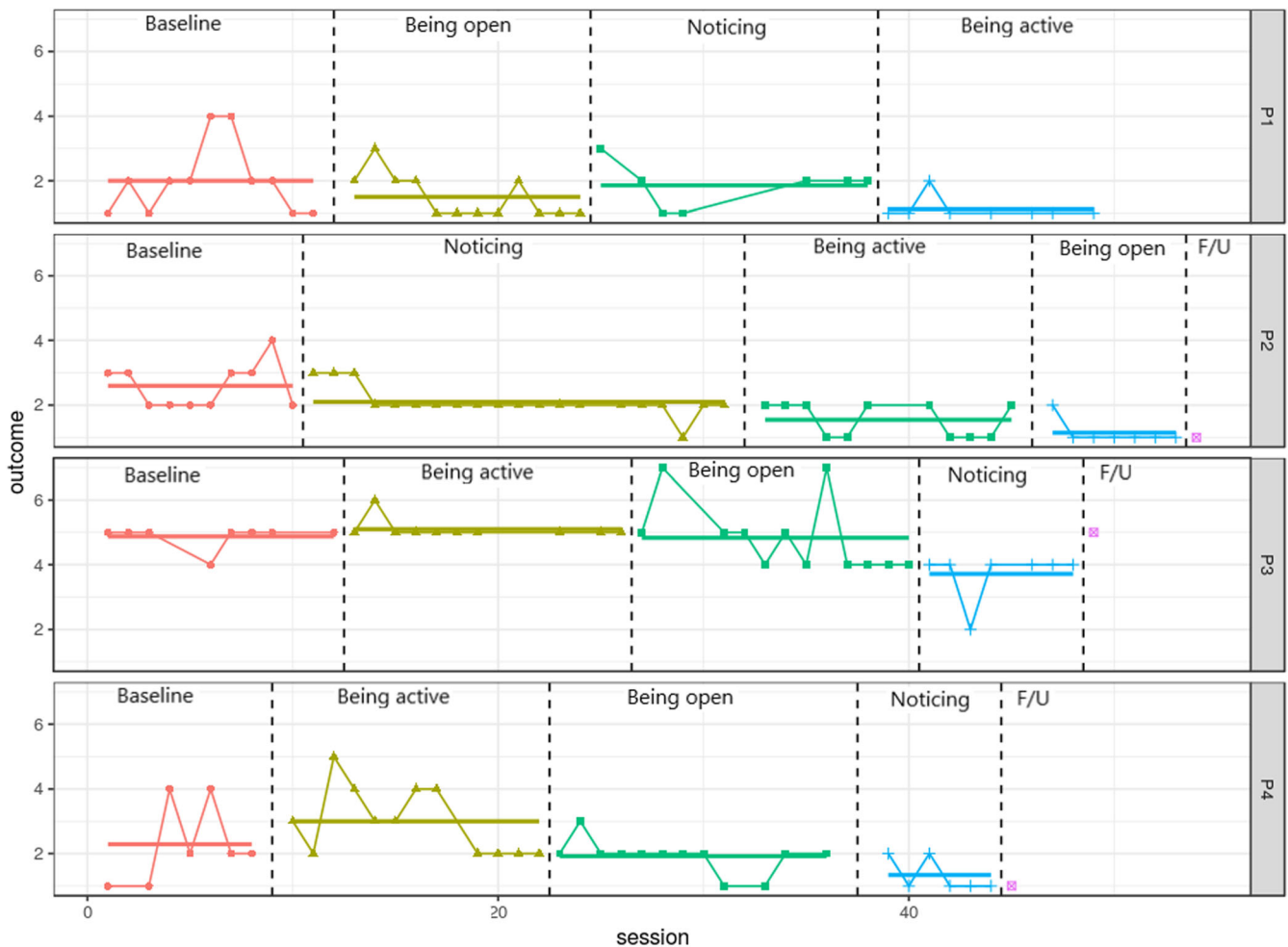
### 4.1 | Q1: Are there changes in exhaustion or work-engagement?

The RCIs indicate that both exhaustion and work-engagement improved over at least one timespan for all participants, except for one participant whose scores did not improve for work engagement (but did for exhaustion). Evidence from the daily measures only found support for exhaustion improving in one participant, for work-engagement in no participants. Given that the RCIs were conducted on data from the full-form measures these analyses are more reliable, and so the lack of variability in the short-form measures for these variables is more likely due to a lack of measurement sensitivity, as discussed in Section 4.6.

This finding is consistent with previous research which has found that burnout (when defined as exhaustion) can be reduced by the use of an ACT intervention (i.e., Brinkborg, Michanek, Hesser, & Berglund, 2011; Smith & Gore, 2012) and provides an alternative view on studies which have reported ambivalent findings from using alternative instruments to measure burnout (or exhaustion), such as the MBI (i.e., Bethay, Wilson, Schnetzer, Nassar, & Bordieri, 2013; Clarke, Taylor, Lancaster, & Remington, 2015). Furthermore, previous research using ACT has not measured changes in work-engagement, despite this being an ACT-consistent construct (i.e. an aspect of psychological functioning which would be expected to increase following an ACT intervention). This finding represents a novel contribution to the literature.

### 4.2 | Q2: Are there changes in psychological well-being or behavioural alignment with idiographic values?

The RCI analyses indicate that there was no reliable change for the PWI for any participant. This indicates that personal well-being did



**FIGURE 7** Graph of the CompACT valued action subscale short-form for each participant, with intervention content labelled for each phase

not change significantly for any participant, which was contrary to the expectation. This can be understood in several ways. First, the intervention did improve the scores on the PWI for all participants but not to level which would constitute reliable change. This could be due to the ‘dose’ of the intervention (i.e., the number of hours contact time) which was smaller than in equivalent studies (such as of those identified in Reeve et al., 2018, where the typical number of hours intervention time was 1½ days, rather than 4 hours in the present study), which may suggest the presence of a dose-effect relationship. Second, the degree to which participants valued occupational aspects of their lives is unknown, and so an improvement in occupational well-being may not necessarily translate into an improvement in overall well-being, although both exhaustion and engagement are thought to be predictors of depression and life satisfaction, which makes this explanation seem unlikely (Hakanen & Schaufeli, 2012).

Assessment of the daily Idiographic Values measure suggested that the intervention significantly increased alignment with work values for three participants and increased alignment with home values for two participants. Overall, analysis of daily values data suggested that the intervention caused meaningful behaviour-change in at least one domain for all participants. This finding should be treated more tentatively than others, given the nature of the

idiographic measure used to assess this (i.e., an untested non-psychometric single-item measure). Following an ACT intervention, behaviour change in a personally meaningful direction would be expected.

### 4.3 | Q3: Are there changes in psychological flexibility?

The RCIs for the CompACT indicate a significant improvement in PF over at least one timespan for all participants, although in the case of one participant this reverted to their baseline score at the follow-up point. Aside for the participant whose PF reverted to their baseline, this is an expected result for an ACT intervention, although one which has not consistently been found in ACT burnout research (Reeve et al., 2018).

When compared to levels of disengagement and exhaustion in employees with physician-diagnosed burnout (Peterson et al., 2008; Reis, Xanthopoulou, & Tsaousis, 2015), this participant (participant 3) started the study in the 99th percentile of employees with clinical levels of disengagement and the 94th percentile of employees with clinical levels of exhaustion—that is, at the extremes of the clinical

range of burnout. It is plausible that improvements were more difficult to maintain for this participant in the face of eroded psychological reserves, although it is not possible to confidently extrapolate from this single example.

The visual analyses suggest that for two participants the improvements in PF were tied to the intervention sessions, and for the remaining two participants, they were possibly tied to the intervention sessions. Consistent with this, improvements of moderate-to-large magnitude were observed for all participants, and these reached statistical significance for two participants. This provides tentative evidence in favour of the ACT intervention enhancing PF as would be expected.

Previous research into ACT for burnout amongst frontline workers typically failed to find an increase in PF, or failed to measure this variable (Reeve et al., 2018) despite it being a key ACT-construct.

#### 4.4 | Q4: Are outcome changes linked to change in PF?

Where outcomes were sufficiently variable, there was evidence of (theoretically consistent) associations with PF (with at least one significant process-outcome association for all participants). However, cross-lag associations did not provide strong evidence for temporal precedence (changes in PF preceding changes in outcome) that would logically support a mediating role for PF. As stated above, given that some previous studies have failed to find an improvement in PF, there is mixed evidence that this construct makes a *causal* contribution to ameliorating burnout, although studies using ACT in other work environments (i.e., a media company [Bond & Bunce, 2000] and a U. K. governmental department [Lloyd, Bond, & Flaxman, 2013]) found PF to have a mediating role. This finding brings research into the amelioration of burnout of frontline workers into line with the broader ACT research programme.

#### 4.5 | Q5: Does varying the sequence of the ACT triflex components affect how PF changed?

In this study certain aspects of the ACT triflex were shown to improve following interventions focussed on *different* aspects of the triflex; including improvement in a given aspect of the triflex which appears to result solely from intervention in different aspects of the triflex. For example, improvements were observed in the being open aspect of PF prior to the delivery of this aspect of the intervention. This finding is consistent with recent studies which have found improvements in given domains of PF from an intervention focussed on a different aspect (Sauer-Zavala et al., 2017). Equally, some participants did not demonstrate any change in one aspect of the triflex despite showing considerable change in others. Overall effects of intervention modules on corresponding aspects of PF were broadly equivalent to effects on non-corresponding aspects of PF.

These patterns of desynchrony could be interpreted as consistent with conceptualization of PF as an overarching process encompassing

distinct yet inter-related subprocesses—that is, that targeting one subprocess could have secondary effects on another subprocess, and yet that subprocesses could also change independently of one another. Conversely, the observed findings may raise substantive questions about the precision of the ACT model and targeting of intervention components (or else, the specificity of the applied PF measure): representing a failure to show a relationship between intervention components and the corresponding aspects of PF that they are intended to change.

#### 4.5.1 | Absence of change at the follow-up timepoint

A notable observation in the data is the lack of change in the full-form measures for any variable between the postintervention and follow-up timepoints, except for one participant whose score changed significantly but in the direction of reversing the improvement seen through the intervention. This finding was unexpected, given that studies in the Reeve et al. (2018) systematic review generally favoured greater (albeit not always significant) changes at follow-up compared with post-intervention, although this was not the case in a study using ACT for burnout amongst a nonfrontline sample (Wersebe, Lieb, Meyer, Hofer, & Gloster, 2018). Additionally, the ACT model might expect gains to be made over a longer period of time, as behavioural patterns merge to be more values-led. It is possible that a longer follow-up period would have facilitated the detection of changes.

#### 4.6 | Limitations

The main methodological difficulty stemmed from the imprecision effect of using a single item for the OLBI short-form measures which only allowed four response levels. This created difficulty when assessing the visual analyses, particularly for the short-form exhaustion and work-engagement measures and may have obscured changes in these variables. Although the rationale for limiting the participant burden by using single items for the daily measures was sound in principle, a better compromise may have been to use two to three items per measure, administered less frequently, and this is what we suggest for future research. The limited sensitivity of daily measures used in the present study can be seen in the instances where the RCI of the full-form measures identified a change which was not captured by the short-form versions. In the current study, short-forms were derived from global measures, and the content of such items may be relatively insensitive to daily fluctuations; we recommend that future studies develop daily measures with evidenced change-sensitivity before using such measures to gauge intervention effects.

Although the measures were chosen to represent a range of aspects of psychological functioning which are thought to determine occupational health and functioning there was no direct measure of effectiveness, such as a measure of the quality of interactions between staff and clients. Such measures have been employed in



previous burnout research (Castro, Rehfeldt, & Root, 2016; Chancey et al., 2018) and would have provided a more robust test of the utility of this intervention but was not used due to ethical and practical barriers.

Although efforts were made to use baselines of different lengths and introduce the intervention nonconcurrently (in a way that provides greater control for threats to internal validity, such as coincidental external events or instrumentation artefacts, across participants) the total baseline period was only a couple of weeks (which could be anomalous weeks for the individuals concerns). Notwithstanding this, direct replication of effects across cases with uneven phase lengths and staggered baseline-to-intervention change points multiple cases does suggest that observed change may be attributable to the intervention.

A final limitation is caused by the randomization of the delivery of the ACT-triflex intervention modules. Although this was a necessary part of the design to answer Question 5 ('does varying the sequence of the ACT-triflex components affect how PF changed?'), there is the risk that it may have had a confounding effect on the results when answering other questions the study sought to answer.

## 4.7 | Implications

Alongside the extant research, the findings here suggest that the routine offer of an ACT intervention for work-related stress could be beneficial to organizations providing direct health and social care work, although a possible dose–response relationship may exist which should be taken into account.

Further research focussed on ACT for occupational well-being could focus on the relationship between PF, work-engagement, and direct measures of behaviours associated with these (for example, the frequency of client engagements which was used by Castro et al., 2016). Additionally, further understanding of the relationship between the different aspects of the ACT-triflex would be a valuable contribution to the ACT research paradigm.

### CONFLICT OF INTEREST

There is no conflict of interest to declare by the authors. This research was undertaken as part of the Trent Doctorate in Clinical Psychology training and was funded through this.

### DATA AVAILABILITY STATEMENT

The raw data for this study are available on request from the corresponding author.

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