A preliminary evaluation of a single session behavioural activation intervention to improve

wellbeing and prevent depression in carers

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Abstract

Background: Major depressive disorder is predicted to be the lead cause of disease burden by 2030. Despite evidence suggesting that major depressive disorder can be prevented, little attention has been paid to developing interventions for this purpose. Since research suggests that high levels of subjective wellbeing may protect against depression, an intervention that can enhance and maintain subjective wellbeing may assist in preventing major depressive disorder. Behavioural activation is a promising intervention that has been observed to both effectively treat depression and also enhance subjective wellbeing, even in a single-session.

Method: A randomised control design was used to investigate the efficacy of a single session of behavioural activation to boost wellbeing and reduce distress in a community sample of carers ($N = 13$), who may be at increased risk of major depressive disorder. Outcome measures assessed symptoms of depression, anxiety, stress, and wellbeing, and the lifestyle factors of perceived environmental reward and the extent to which individuals lived in accordance with their personal values.

Results: Generalised linear mixed modelling revealed significant Group x Time interactions for stress scores and valued living, indicating a treatment effect on these outcomes.

Conclusions: Findings provide preliminary support for the effectiveness of a single session BA intervention to improve outcomes of carers.

Key words: behavioural activation, carers, major depressive disorder, subjective wellbeing, wellbeing, values.

Key points:

- Given the prevelance and enormous personal, social, and economic costs associated with major depressive disorder, there is a need for interventions to prevent this disorder

- Behavioural activation is an evidence-based approach for the treatment of depression which has also been found to be associated with increased wellbeing. It may also represent a viable approach for preventing major depressive disorder.

- The present study found that a single session of behavioural activation was associated with reduced stress and an increase in self-reported behaviour consistent with personal values. These results suggest that further investigation of the potential of BA for preventing major depressive disorder is warranted.

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Major depressive disorder (MDD) is characterised by a persistent depressed state, a loss of interest or pleasure in daily activities, and disturbances to other aspects of functioning such as sleep, appetite and concentration (American Psychiatric Association, 2013). According to projections by the World Health Organization, MDD is estimated to be the lead cause of disease burden by 2030, with researchers linking the disorder to a range of adverse outcomes such as increased risk of early mortality, interpersonal difficulties, lost work days and increased difficulties finding employment (Lépine & Briley, 2011). Given the prevalence and impact of depression it seems pertinent to develop effective interventions to both treat and prevent the disorder. At present, much of the clinical research and practice has focused on the treatment rather than prevention of MDD (Clark, 2011). There is a need to explore and develop techniques to prevent depression as part of an initiative to improve and sustain long-term community health. Importantly, preliminary evidence suggests that MDD can be prevented and that existing treatments may offer useful clinical tools in further developing such preventative interventions (Muñoz, Beardslee, & Leykin, 2012).

Behavioural Activation (BA) is a therapeutic approach commonly used in clinical settings to treat depression and is found to produce significant and clinically meaningful outcomes (Mazzucchelli, Kane, & Rees, 2009). According to behavioural models, depression can develop when an individual withdraws from potentially rewarding activities, such as social interaction, work and hobbies, and this withdrawal disrupts the individual's access to positive reinforcement, leading to decreases in mood, motivation, and further withdrawal (Martell, 2010). BA treatments developed as a method to address the behavioural maintaining factors within this model, with the ultimate goal of improving the individual's mood by increasing their activation and engagement with rewarding activities (Lejuez, Hopko,

Acierno, Daughters, & Pagoto, 2011). When delivering a BA intervention, therapists assist clients to identify rewarding activities to engage in, often in a hierarchical manner to ensure that the goals are achievable.

BA has been shown to effectively treat symptoms of depression across a range of client settings and presentations (Mazzucchelli et al., 2009). In further support of the potency of BA interventions, a recent study suggests that improvements in depressive symptoms can be observed even when BA treatment is administered in a single session. Gawrysiak, Nicholas, and Hopko (2009) administered a single-session of a BA treatment to university students reporting moderate levels of depression. A two-week treatment period followed the intervention session in which participants were to complete behavioural goals discussed in session. At posttest results indicated that those in the intervention condition reported a significant improvement in depressive symptoms compared to a no treatment control. This suggests that BA, even when administered in a single session, can effectively assist individuals to make daily behavioural changes resulting in improved mood and reduced symptoms of depression. However, at present this brief BA protocol has only been applied to moderately depressed university students, and it would be useful to investigate the efficacy of the approach with other populations.

Although currently used as a treatment for MDD, BA may also be useful as an intervention to prevent depression by enhancing wellbeing. Subjective wellbeing (SWB), can be defined as a frequent positive affect, infrequent negative affect and high levels of life satisfaction (Diener & Seligman, 2002). The principles of the BA treatment approach are consistent with research findings on common factors associated with high levels of SWB (Mazzucchelli, Rees, & Kane, 2009). It has been observed that happy individuals consistently report being more socially active, that individuals who are engaged in activities consistent with their values report greater levels of life satisfaction, and that intentional changes in

activities or practices (such as exercising regularly or trying to be kind to others) are a better predictor of long term happiness than circumstantial changes (Diener & Seligman, 2002; Lyubomirsky, King, & Diener, 2005; Lyubomirsky, Sheldon, Schkade, 2005; Sheldon & Lyubomirsky, 2006). These findings are consistent with BA and suggest that individuals who purposefully engage in positive, enjoyable activities will be more likely to experience, and maintain, feelings of positive wellbeing. According to behavioural models, this increased engagement with one's world is likely to decrease the risk of developing depression (Martell, 2010). Where an intervention is successful in boosting and maintaining wellbeing, it may also be effective in the prevention of depression.

Mazzucchelli, Kane, & Rees (2010) conducted a meta-analysis to examine the effects of BA based interventions on wellbeing. Based on a sample of 20 studies the analysis found a significant and moderately sized effect of BA interventions on wellbeing outcomes, regardless of depression status. It was also noted by the authors that the observed improvements in wellbeing were maintained at 3-month follow-up. These findings suggest that BA could have potential for improving and sustaining wellbeing in clinical and non-clinical samples and further investigation of the potential of BA to improve wellbeing is warranted. As such, it would be particularly relevant to apply such interventions to sectors of the population identified as being at an increased risk of experiencing MDD.

Individuals who perform a "carer" role, by providing ongoing support to a person with disability or chronic illness, are an example of a population at increased risk of experiencing MDD. It is consistently reported in the literature that the caregiving role is associated with increased burden, ongoing stress and lack of social support and that these factors impact on the wellbeing of carers and place them at increased risk of depression (e.g., Searson, Hendry, Ramachandran, Burns, & Purandare, 2008; Waite, Bebbington, Skelton-Robinson, & Orrell, 2004). Therefore, exploring methods to improve wellbeing in non-

depressed carers is an important step in developing strategies to prevent depression and improve long-term community health.

There is already evidence indicating that BA-based interventions are an effective method for improving psychological outcomes for carers, with lower levels of psychological distress reported by those engaged in higher levels of pleasant activities (Hirano et al., 2011). A recent study investigating the relationship between levels of carer activity and carer distress, also observed a significant relationship between the frequency of leisure time and more positive psychological outcomes for carers (Romero-Moreno, Losada, Marquez-Gonzalez, & Mausbach, 2014). The authors noted that among the carers with high levels of activity, only those who also reported high levels of satisfaction in their activities showed improved psychological outcomes. This suggests that it is not just the quantity of pleasant events, but also the quality or level of satisfaction these activities bring that will have the greatest benefit to SWB. Therefore, individualised BA interventions that assist carers to set personal goals for activity engagement may be most beneficial in ensuring that carers experience more frequent and satisfying activities.

BA techniques offer a simple yet promising intervention to improve wellbeing outcomes for carers. Furthermore, individuals in a caring role are likely to have significant time restrictions, and would be most likely to engage in time-efficient intervention programs. The treatment protocol similar to that used by Gawrysiak and colleagues (2009), where BA is delivered in a single session, may offer a parsimonious intervention to improve and sustain wellbeing and thus assist in the prevention of depression in carers.

The current study is the first to explore the efficacy of a single-session individualised BA intervention in a waitlist controlled design to boost wellbeing and reduce symptoms associated with depression in a non-depressed, community sample of carers. Primary outcome measures assessed symptoms of psychopathology such as depression, as well as

positive wellbeing, such as life satisfaction and happiness. Secondary outcome measures assessed lifestyle factors targeted by the BA intervention such as perceived environmental reward and the consistency to which individuals lived within their personal values (referred to hereafter as valued living). Outcome measures were collected at baseline and then immediately after the 2 week treatment interval. It was hypothesised that between the pre-test and the post-test, the intervention group would exhibit significantly therapeutic change across all outcomes, compared to the waitlist control group. In addition, the proportion of participants showing reliable pre-post changes in outcome measures would be greater in the intervention group than the waitlist control group. Finally, it was hypothesised that the therapeutic effects of the intervention on depression and wellbeing would be mediated by the secondary outcomes—environmental reward and valued living. If the current single session intervention is effective in promoting wellbeing this may provide the platform for brief behavioural interventions to be developed and implemented across the broader community as an initiative towards improving community health and wellbeing.

Method

Participants

Individuals were eligible to participate if they met criteria as a carer in accordance with s05 of the *Carers Recognition Act 2004* (Western Australia) where a carer is anyone who "provides ongoing support, care or assistance to a person with disability or chronic illness (including mental illness)". Both family carers and non-family carers (who were working in a carer role through organised support services or volunteer work) were included in the study. This latter group comprised 15% of the final sample.

Participants were recruited through carer support organisations who distributed study information to members, as well as through radio advertisement, online media advertisement and word-of-mouth between participants. Individuals who were interested in participating

contacted the experimenter at Curtin University to receive more information. A brief phone screening was conducted as part of the initial phone call in which participants were assessed for symptoms of depression. Only participants who indicated that they were currently experiencing a depressive episode were not eligible to participate, anyone who indicated this was referred to a more appropriate service. The flow of participants through each stage of the study is shown in Figure 1.

The final sample consisted of 13 carers (12 female) with a mean age of 52.8 years (*SD* = 14.3 years). According to an a priori power analysis, at an alpha-level of .05, 13 participants are only capable of capturing a "large" ($f = 0.45$) interaction effect. The majority of the sample reported caring for a single relative (85%), with the largest proportion caring for a child (46%), followed by spouse (24%) and parent (15%). The remaining proportion of the sample (15%) reported caring for non-family members, either through volunteer or paid work. All participants completed informed-consent procedures prior to participating in the study.

Procedure

Ethical approval was obtained from Curtin University's ethics committee in accordance with the National Health and Medical Research Council of Australia standards. Once consent was obtained and the participant was allocated to a treatment condition, an appointment time was made. Participants who were allocated to the control condition were mailed the first set of outcome measures to be completed 2 weeks prior to the appointment. Participants in both conditions completed the measures at the appointment (Time 2 for control, Time 1 for intervention). Following the assessment phase, the appointment proceeded immediately to the intervention phase. The participant and clinician completed the 90-minute BA protocol at the Curtin University Psychology Clinic. The appointment lasted approximately 2 hours. Participants in the intervention condition were given a second set of

measures to complete 2-weeks after the appointments and return via mail. Participants

received a reminder text at the 2-week mark to prompt them to complete and return measures.

Design

The study used a pre/post mixed design, with intervention condition (BA or waitlist

control) as the between participants factor. Once consent was obtained participants were

randomly allocated to a study condition using a computerised random number generator.

Both groups completed outcome measures at baseline (Time 1), and two weeks later (Time

2). Participants in the intervention condition received the intervention after Time 1 measures

were collected. Participants in the control group were offered the intervention after the

outcome measures had been collected at Time 2.

Primary Outcome Measures

The Depression Anxiety Stress Scales 21 (DASS-21; Lovibond & Lovibond, 1995) is

a 21-item self-report measure that assesses symptoms of depression, anxiety and stress. The

DASS-21 is widely used with high internal consistencies for the Depression ($\alpha = .88$),

Anxiety ($\alpha = .82$), and Stress ($\alpha = .90$) scales, and good convergent and concurrent validity

(Henry & Crawford, 2005).

The Warwick-Edinburgh Mental Well-being Scale (WEMWBS) is a 14-item measure

of mental wellbeing that focuses specifically on positive aspects of mental health (Tennant et

al., 2007). Individuals rate their experience of a series of statements (e.g., "I've been feeling

optimistic about the future") on a scale of 1 ("none of the time") to 5 ("all of the time"). The

scale has high internal consistency ($\alpha = .90$), as well as good content validity, and test-retest

reliability (0.83; Tennant et al., 2007).

Secondary Outcome Measures

The Reward Probability Index (RPI) is a 20 item measure that assesses environmental

reward (Carvalho et al., 2011). The RPI yields a Total score and two subscales: Reward

Probability and Environmental Suppressors. Individuals rate the level of agreement, from 1 ("strongly disagree") to 4 ("strongly agree") of a series of statements relating to environmental positive reinforcement (e.g., "I make the most of the opportunities that are available to me"). The RPI has strong internal consistency for the Total score (α = .88 to .92). The scale also demonstrates good convergent validity (Carvalho et al., 2011). For this study we were interested in the Reward Probability subscale of the RPI as a proxy index for response contingent positive reinforcement (Carvalho et al., 2011).

The Valued Living Questionnaire (VLQ) is a brief two-part instrument designed to assess how consistently an individual is living their life values (Wilson, Sandoz, Kitchens, & Roberts, 2010). In the first part participants rate the importance of 10 domains of living on a 10-point Likert-type scale. These life domains are: (a) family (other than parenting and intimate relations), (b) marriage/couples/intimate relations, (c) parenting, (d) friendship, (e) work, (f) education, (g) recreation, (h) spirituality, (i) citizenship, and (j) physical self-care. In the second part participants rate on the same 10-point scale how consistently they have lived within their values across these domains, in the last week. The sum of the consistency items, yields the overall Consistency Scale, with higher scores indicating more consistent valued living. The VLQ Consistency Scale has good internal consistency (α = .75; Wilson et al., 2010).

BA Intervention

The single session BA intervention was adapted from the Brief Behavioral Activation Treatment for Depression (BATD) manual (Lejuez et al., 2011; Lejuez, Hopko, & Hopko, 2002) whereby participants identify their key values across a range of life areas (relationships, education/career, recreation/interests, physical health, spirituality) and then identify activities consistent with their values within each area that they could engage in. For the current study, and as per Gawrysiak et al.'s protocol (2009), the original nine-session

format was condensed into a single 90-minute session, whereby a greater amount of activities were targeted for immediate engagement. Each participant was provided with a workbook summarising the approach (Mazzucchelli, 2014).

A postgraduate student in clinical psychology was trained in BATD via a training DVD and supervision with a senior clinical psychologist prior to administering the intervention. All components of the intervention were listed in a protocol checklist, and were ticked off by the therapist to indicate protocol adherence. Table 1 summarises the components of the 90 minute intervention. The intervention began with the presentation of information pertaining to wellbeing and depression, and a treatment rationale. Following this, participants identified key values across the five life areas, and worked collaboratively with clinicians to identify activity goals, consistent with those values to achieve within the 2-week treatment period. Participants set weekly goals and monitored these using weekly monitoring forms. Participants were encouraged to review and modify goals at the end of each week, as well as to troubleshoot barriers to goal achievement.

Results

Sample Characteristics

The mean outcome scores for intervention and control participants at pre-test and post-test are presented in Table 1. Independent sample t-tests revealed no significant differences between the intervention and control groups across all outcome measures at pre-test, suggesting that any observed differences at post-test are more likely to be attributed to effects of the intervention.

Participant Adherence

Participant adherence to the intervention recommendations was measured using the weekly behavioural monitoring forms, which participants were asked to return at post-treatment. A participant adherence score was calculated by dividing the amount of goals set,

by the amount of goals achieved over the intervention period. For participants who forgot to return their monitoring forms, the clinician conducted a follow-up phone call to record how many goals the participant had been able to achieve in the 2-week treatment period. On average participants set 7.15 activities ($SD = 4.2$) to complete over the intervention period and completed an average of 4 ($SD = 2.3$) of the assigned activities, thus successfully completing 56% of self-assigned activities.

Treatment Outcome Data

All outcome variables were examined by running a series of Generalised Linear Mixed Models (GLMMs). In order to optimise the likelihood of convergence, the GLMMs were tested separately for each of the outcome measures (DASS-21, WEMBWS, RPI, VLQ). To assess the pre/post improvements the GLMM had one nominal random effect (participant), one nominal fixed effect (group: intervention, waitlist control), one ordinal fixed effect (time: pre, post), and the Group x Time interaction. A significant Group x Time interaction would indicate an intervention effect.

As reported in Table 2, large and significant Group x Time interactions were evident on both the DASS-Stress scores $F(1,22) = 17.30$, $p < .001$, partial eta-squared = .57 and VLQ scores, $F(1, 21) = 4.63$, $p = .043$, partial eta-squared = .26. Pairwise contrasts revealed a significant reduction in Stress scores, from pretest ($M = 9.71$) to posttest ($M = 7.28$), $p < .001$, Cohen's $d = .53$, for the intervention group, and a significant increase in valued living from pretest ($M = 55.7$) to posttest ($M = 68.3$), $p = .045$ (one-tailed), Cohen's $d = .13$, for the intervention group. The DASS-Depression, DASS-Anxiety, WEMWBS and RPI did not yield any significant Group x Time effects (see Table 2).

Mediating effects of VLQ on Stress

To assess whether the intervention effect on stress is mediated by changes in VLQ another GLMM was conducted. The GLMM had one nominal random effect (participant),

one nominal fixed effect (group: intervention, waitlist control), and one scale fixed effect (VLQ). Group is the independent variable; valued living is the mediator variable; and DASS-stress is the outcome. If the previously significant Group x Time interaction were no longer significant, this would suggest that the pre-post changes in VLQ are associated with pre-post changes in DASS-Stress. The Group x Time interaction remained significant, however at a reduction from the $p < .001$ to $p < .05$ level, $F(1,20) = 4.95$, $p = .038$. This indicated there may be a partial mediation effect.

Reliable and Clinically Significant Change

Due to the small sample size it was useful to examine participant outcomes at an individual level. Reliable change indices (RCIs) were calculated for each outcome measure, and evaluated according to the Jacobson and Truax (1991) criteria, whereby a score that is equal to or exceeds 1.96 indicates reliable change. RCIs were further evaluated to determine whether they had reached clinical significance, using clinical cut-off scores. Whereby, according to the Jacobson and Truax (1991) criteria, clinically meaningful change occurs when a participant's post-assessment score reflects a change from a clinical to nonclinical distribution. For measures that did not have a clinical cut off (such as measures of wellbeing) clinically significant change was defined as movement from the below-average range at preintervention to the average or above average range at postintervention, whereby a score of plus or minus 1 SD from the mean of a normative group is the average range (Wise, 2004). On the basis of these calculations, participants were grouped into those who experienced reliable change and those who did not experience reliable change and were further divided into four groups for each outcome variable; those demonstrating clinically significant change (a preintervention score above the clinical cut-off and a postintervention score below the cut-off), those who were better than criterion for clinically significant change at preintervention (preintervention and postintervention scores below the cut-off), those who failed to achieve

clinically significant change (preintervention and postintervention score above the cutoff),

and those participants whose scores worsened (preintervention scores below the cutoff and

postintervention score above the cutoff). Across the outcome measures a greater proportion

of participants in the intervention group experienced reliable and clinical improvement,

compared to the waitlist control group. These data are summarised in Table 3.

Discussion

The current study provides preliminary evidence to support the effectiveness of a

single session BA intervention to improve wellbeing outcomes and reducing stress in carers.

Analysis revealed two significant intervention effects for stress and valued living scores.

These findings suggest that the single-session BA intervention was effective in reducing

stress for carers, and assisting carers to reconnect with valued life areas. These results were

also supported in individual analysis of participant improvement using the RCI, with a larger

proportion of participants in the intervention condition showing reliable improvements on

stress and valued living, compared to controls.

The current results are a significant step in developing effective, parsimonious

interventions to improve wellbeing for carers. In particular, it is significant that the current

intervention was effective in reducing stress levels for carers, given that increased exposure

to stress is one of the most widely reported variables associated with depression risk in the

carer population (Yueh-Feng & Wykle, 2007). Whilst stress is not a symptom directly

targeted by BA, the intervention included a rationale pertaining to wellbeing and the

importance of engaging in healthy patterns of behaviour, and how this may protect against

depression. This may have served to reduce feelings of guilt that carers can feel when they

engage in self-care and leisure activities. Further, if participants re-connected with important

life areas, such as physical health and leisure, this may have helped to reduce the stress

associated with daily caring demands. This is supported in the interesting finding that

improvements in stress levels may be partially mediated by a reported increase in the consistency of living within one's values.

The intervention did not significantly improve wellbeing outcomes and reduce symptoms of depression at the group level, as hypothesised. Despite this, it seems plausible that reducing stress levels and improving valued living could be an intermediate step in improving other aspects of wellbeing for carers. If stress levels reduce carers may have greater capacity to experience pleasure and satisfaction from life. Similarly, once carers feel more connected with what is most important to them, they are likely to experience greater feelings of satisfaction (Wilson et al., 2010). It is possible that the two-week intervention period may not allow enough time for the intervention to demonstrate its full effect. Accordingly, it would be important for future research to include a longer-term follow-up.

There are several limitations of the current study, the small sample size being the most pertinent. If there were small or moderate but real group intervention effects on depression and anxiety outcomes, the present study's sample size was too small to detect them. Given the promising nature of the present results at an individual level, there is good reason to replicate the study with a larger sample. In addition to the small sample size, participant treatment adherence, at 56%, suggests that many participants may not have received the full benefits of the intervention. In future, this issue may be resolved by including a short "check-in" phone call half-way through the two-week treatment period, to remind and prompt participants to monitor and review daily goals. The caregiving role is associated with significant demands to both time and cognitive resources and, as such, it was commonly reported that carers forgot, or faced time restraints that prevented higher levels of goal achievement, despite trouble-shooting such barriers with the therapist during the intervention session. It may also be useful to determine whether carers who could not complete initial goals were able to modify and attempt alternative goals, which may not have

been captured in the current treatment adherence scores.

Despite these limitations, the results of the current study are a promising platform for future practitioners and researchers to continue to explore the benefits of brief BA interventions aimed at improving positive psychological outcomes. At present the field of clinical psychology tends to focus treatment research on developing methods to reduce psychological pathology, and there is a need to broaden the scope of such research to consider the value of preventative interventions that have positive outcomes. The present study provides preliminary evidence that brief BA has potential as a parsimonious intervention that can boost individual's wellbeing.

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Table 1.

Treatment Components in the Single-Session Behavioural Activation Protocol

Intervention Component	Details
1. Introduction	Brief overview of session content and duration.
2. Psychoeducation	Discuss nature of wellbeing and benefits.
3. Treatment Rational	Introduce BA.
	Discuss BA's emphasis on behavioural change as a way to increase positive feelings.
4. Life Values Assessment	Introduce five life areas.
	Identify key values in each life area.
	Identify value-based activities.
5. Activity Hierarchy	Select and rank activities according to level of difficulty.
6. Goal setting	Introduce weekly monitoring form.
	Set activity goals for first week (frequency, duration).
	Discuss how to monitor progress.
7. Review and Modify Goals	Discuss how to review goals.
	Discuss how to modify goals where necessary.
	Troubleshoot barriers to achieving goals.
8. Session Close	Final summary.
	Review homework.
	Schedule follow-up.

Table 2.

Treatment Outcome as a Function of Group

Outcome measure and group	Pre-treatment		Post-treatment		Group x Time (*F*)	Partial eta-squared
	M	SD	M	SD		
DASS-Depression					0.72	.06
Intervention	9.43	8.54	6.86	6.91		
Control	12.00	8.85	11.33	9.60		
DASS-Anxiety					0.98	.06
Intervention	6.00	7.02	4.57	5.85		
Control	4.00	4.90	4.00	4.90		
DASS-Stress					17.30***	.57
Intervention	19.43	8.30	14.57	9.14		
Control	16.00	7.15	17.33	9.43		
WEMWBS					0.33	.02
Intervention	47.71	11.05	49.57	8.34		
Control	45.33	8.82	45.50	7.15		
RPI-Reward					0.03	.00
Intervention	33.43	7.02	34.43	3.70		
Control	32.00	5.83	32.67	4.46		
VLQ					4.63*	.26
Intervention	55.71	21.93	68.83	18.31		
Control	64.50	22.69	57.67	13.38		

Note. DASS = Depression Anxiety Stress Scales; WEMWBS = Warwick Edinburgh Mental Wellbeing Scale; RPI–Reward = Reward Probability subscale of the Reward Probability Index; VLQ = Valued Living Questionnaire.
Normal range for DASS subscales: Depression (0-4), Anxiety (0-3), Stress (0-7).
Conventions for interpreting partial eta-squared: .01 = small, .06 = moderate, .14+ = large
*$p < .05$, **$p < .01$, ***$p < .001$.

Table 3.
Proportions of Reliably and Clinically Improved Participants for each Outcome Measure for the Intervention and Waitlist Control Groups

Measure	Subscale	Outcome	Reliable Change		No Reliable Change	
			Intervention	Waitlist	Intervention	Waitlist
DASS-21	Depression	Clinically significant change	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
		Better than criterion at both pre-intervention and post intervention	0 (0.0%)	0 (0.0%)	5 (71.4%)	3 (33.3%)
		Failed to achieve clinically significant change	1 (14.3%)	1 (16.7%)	1 (14.3%)	2 (33.3%)
		Worsened	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (16.7%)
	Anxiety	Clinically significant change	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
		Better than criterion at both pre-intervention and post intervention	0 (0.0%)	0 (0.0%)	1 (16.7%)	3 (50.0%)
		Failed to achieve clinically significant change	1 (14.3%)	0 (0.0%)	0 (0.0%)	2 (33.3%)
		Worsened	0 (0.0%)	0 (0.0%)	1 (14.0%)	0 (0.0%)
	Stress	Clinically significant change	1 (14.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
		Better than criterion at both pre-intervention and post intervention	0 (0.0%)	0 (0.0%)	4 (57.1%)	4 (66.7%)
		Failed to achieve clinically significant change	0 (0.0%)	0 (0.0%)	1 (14.3%)	2 (33.3%)
		Worsened	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (16.7%)
WEMWBS		Clinically significant change	1 (14.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
		Better than criterion at both pre-intervention and post intervention	0 (0.0%)	0 (0.0%)	4 (57.1%)	4 (66.7%)
		Failed to achieve clinically significant change	0 (0.0%)	0 (0.0%)	1 (14.3%)	2 (33.3%)
		Worsened	0 (0.0%)	0 (0.0%)	1 (14.3%)	0 (0.0%)

RPI-Reward	Clinically significant change	2 (28.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	Better than criterion at both pre-intervention and post intervention	0 (0.0%)	0 (0.0%)	4 (57.1%)	4 (66.7%)
	Failed to achieve clinically significant change	0 (0.0%)	0 (0.0%)	1 (14.3%)	2 (33.3%)
	Worsened	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
VLQ	Clinically significant change	2 (28.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	Better than criterion at both pre-intervention and post intervention	0 (0.0%)	0 (0.0%)	2 (28.6%)	4 (66.7%)
	Failed to achieve clinically significant change	0 (0.0%)	0 (0.0%)	2 (28.6%)	1 (16.7%)
	Worsened	0 (0.0%)	0 (0.0%)	1 (14.3%)	1 (16.7%)

Note. Percentages given in brackets represent a percentage of the participants from either the intervention or waitlist control group, not a percentage of the total number of participants. DASS = Depression Anxiety Stress Scales; WEMWBS = Warwick Edinburgh Mental Wellbeing Scale; RPI–Reward = Reward Probability subscale of the Reward Probability Index; VLQ = Valued Living Questionnaire.

Figure 1. Flow of participants through each stage of the behavioural activation intervention.

Follow-Up

| Lost to follow-up (declined post-intervention assessment) ($n = 3$) | Lost to follow-up (on holiday) ($n= 1$) |

Analysis

| Analysed ($n = 7$) | Analysed ($n = 6$) |