Self-help for Stress and Burnout without Therapist Contact: An Online Randomized Controlled Trial

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Abstract

Interventions designed to reduce stress and burnout may be costly and access is limited. This study examined the effectiveness of a self-help book, using Acceptance and Commitment Therapy (ACT) to target stress and burnout in a randomized controlled online trial without any therapist contact. Participants were recruited through a newsletter of a health insurance company. Participants (N = 119) who reported at least moderate levels of stress were randomly assigned to an immediate intervention (n = 61) or a waitlist group (n = 58). Measures before and after the intervention assessed stress, burnout (primary outcomes), depression, well-being, emotion regulation (secondary outcomes) and ACT-specific constructs. Compared to the WL, participants in the immediate intervention group reported lower stress and burnout and higher psychological flexibility at post-assessment. Effects between groups were large for stress (d = 0.9), moderate to large for burnout (d=0.5-0.8) and large for psychological flexibility (d = 0.8). All primary and most secondary outcomes and ACT processes continued to improve in the 3-month-follow-up period. Results suggest that an ACT self-help book without any therapist contact is effective in reducing stress and burnout for various occupations. Thus, it may provide a cost-effective public health intervention for reducing stress and burnout.

Keywords: acceptance and commitment therapy, psychological flexibility, self-help, no therapist contact, stress, burnout

A remarkable 30–40% of employees experience their work as stressful (National Institute for Occupational Safety and Health [NIOSH], 1999). Stress in the workplace poses a serious threat to mental and physical health (Kivimäki et al., 2002) and is associated with significant disability and socio-economic costs (Houtman et al., 1999; Kessler, Merikangas, & Wang, 2008).

Within the occupational context, chronic stress has been closely linked to the term of burnout. Although not a disorder in the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM–5; American Psychiatric Association, 2013), a large body of research has addressed various aspects of the concept. A widely accepted definition of burnout stipulates it as one's response to chronic stressors in the workplace characterized by three dimensions: 1) exhaustion, 2) cynicism, and 3) a lack of personal efficacy (Maslach, Schaufeli, & Leiter, 2001). Burnout has been associated with physical illness (Honkonen et al., 2006) and mental health problems such as depressive disorders or reduced well-being (Ahola et al., 2005; Milfont, Denny, Ameratunga, Robinson, & Merry, 2008), reduced productivity, job turnover (Wright & Cropanzano, 1998) and absenteeism (Toppinen-Tanner, Ojajarvi, Vaananen, Kalimo, & Jappinen, 2005) . These data suggest burnout is a serious consequence of stress.

Treatment of Burnout and Stress

Interventions to alleviate work stress focus on either psychological resources/ responses of the individual or changes to the occupational context itself. At the individual-level, interventions aim to develop or increase employees' use of effective coping strategies when facing stress and include cognitive-behavioral approaches, relaxation techniques and meditation, and interventions that aim to increase the development of knowledge and work-related skills (Maricutoiu, Sava, & Butta, 2016; Richardson & Rothstein, 2008). In a review of uncontrolled studies (Awa, Plaumann, & Walter, 2010) 80% of programs showed a decrease in burnout. In a recent meta-analysis of randomized controlled trials on burnout-interventions a small effect for reducing emotional

exhaustion (d=0.17) was reported but no effect for depersonalization and personal accomplishment was found (Maricutoiu et al., 2016).

Interventions aimed at reducing stress and burnout often take place within individual organizations, targeting individual professions such as teachers, social workers or nurses. Such an approach renders individuals suffering from burnout and stress symptoms at the mercy of good fortune: if their organization offers a program, they may receive useful help, otherwise individuals are left to their own devices. Self-help bibliotherapy may be an effective and inexpensive alternative to therapist-administered psychological interventions and provide the opportunity to increase the availability and affordability of interventions. An abundance of self-help books are publicly available, yet little evidence directly supports commercially available self-help books for individuals who struggle with symptoms of burnout or stress. A crucial question remains how effective a stand-alone self-help book is when presented in its naturalistic setting e.g., such as a book would be read if one bought it from a store.

Acceptance and Commitment Therapy (ACT)

Acceptance and Commitment Therapy (ACT) is a cognitive behavioral therapy whose goal is the enhancement of psychological flexibility and has been found to be effective for a wide array of disorders (Hayes, Pistorello, & Levin, 2012). Psychological flexibility involves the willingness to experience internal stimuli. By accepting rather than changing, avoiding or otherwise controlling these stimuli, people can act in a way that is consistent with their values (Hayes, Strosahl, & Wilson, 2011). People high in the skill of psychological flexibility may have more attentional resources available to note or effectively respond to performance-related demands present in their environment, as they let go of habitual and unhelpful efforts to control internal reactions to aversive stimuli. Therefore they are better able to engage, or cope, with immediate environments, hence to learn how to react to stress or to do their job more effectively (Bond & Flaxman, 2006).

There is growing evidence to support the effectiveness of ACT in reducing stress (Flaxman & Bond, 2010) and alleviating symptoms of burnout (Brinkborg, Michanek, Hesser, & Berglund, 2011; Hayes et al., 2004; Lloyd, Bond, & Flaxman, 2013). An increase in psychological flexibility was shown to mediate the decrease in the exhaustion component of burnout, which in turn buffered against deterioration in cynicism (Lloyd et al., 2013). Another study demonstrated the effectiveness of an ACT self-help book for teachers and other school staff without therapist contact for general psychological health and stress (Jeffcoat & Hayes, 2012). Despite these encouraging findings, further studies examining ACT in different settings are warranted. To our knowledge, ACT has never been used as a stand-alone self-help intervention for burnout and stress in an unselected sample of different occupational categories or organizations without any therapist support whatsoever. Evidence–based psychotherapy interventions don't always translate into effective stand-alone self-help. Because self-help materials are likely used without therapist contact, empirical evaluations that involve limited or no therapist contact are recommended (Rosen & Lilienfeld, 2016).

Thus, the purpose of the present study was to examine the effectiveness of a self-help book based on ACT (Waadt & Acker, 2013a) on mental health *without any* therapist contact for individuals experiencing symptoms of burnout and stress in a randomized controlled trial conducted online. We hypothesized that the self-help book is effective, specifically that the self-help book intervention would produce greater improvements in perceived stress, burnout (primary outcomes), depression, well-being (secondary outcomes) and ACT-specific constructs than those observed in the control condition (hypothesis 1) and that within-group gains would be maintained over 3 months (hypothesis 2).

Method

Design and Procedure

This randomized controlled trial was conducted exclusively online using an internet-platform created for the purpose of this study, between November 2013 and November 2014. Standardized invitations for assessments and reading assignments were sent via automated email. Participants were randomized into either the immediate intervention group or the waitlist groups. After baseline participants in the immediate intervention group received the self-help book with study-imposed structures (including reading assignments, weekly assessments and comprehensions quizzes). The immediate intervention group completed post-assessment after reading the last chapter, which was scheduled six weeks after baseline. The waitlist group completed a baseline before and post-assessment after the waiting period. Post-assessment denotes end-of-intervention for the immediate intervention group and the end of the waiting period for the waitlist group.

After post-assessment, those in the waitlist received the self-help book and were re-assessed for end-of-interventions assessment, which was scheduled six weeks after post-assessment. Three months after the respective end-of-intervention assessment all participants received a follow-up assessment.

If participants did not complete assessments on time, email reminders were automatically sent indicating the relevance of the assessments. If assessments remained uncompleted, participants were contacted to determine if there were technical problems (i.e. receiving emails). No aspects of the book were discussed with any participant by the study staff.

The waitlist group initially consisted of two separate groups to examine the effect of study-specific structures (e.g. reading assignments, quizzes, weekly assessment) used in self-help studies in the waiting period and during the intervention. For one waitlist group these study-specific structures involved the weekly assessment of psychological flexibility in the waiting period and structure during the intervention in the form of reading assignments, quizzes and weekly assessments of psychological flexibility. The other waitlist group received no such structure before or during the intervention.

Compensation for study participation after completion of follow-up consisted of a book with a similar topic and a summary of the course of their symptoms. The study was approved by the local ethics committee and full informed consent was secured from all participants. The Statement 2010 Checklist can be found in the supplemental online material.

Inclusion / Exclusion

Participants ($N = 119$) were recruited through a newsletter of a German health insurance company. Individuals interested in the study were screened for inclusion into the study. Inclusion criteria consisted of a score of at least 17 on the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983). Consistent with previous research (Brinkborg et al., 2011) this value was chosen as it represents the mean of a normative adult population (Cohen & Janicki-Deverts, 2012). Thus, the defined cut-off ensures that participants have at least moderate levels of perceived stress. Exclusion criteria consisted of concurrent psychotherapy or clinically significant suicidal intent as indicated by a score greater than 1 on Beck Depression Inventory (BDI-II; Beck, Steer, & Brown, 1996) item 9.

Randomization

A block randomization was carried out with a 2:1:1 ratio for the three groups, using computer-generated random sequences of numbers (Urbaniak & Plous, 2013) established by the principal investigator. Study staff assigned participants to conditions.

Intervention

The ACT self-help book targeting burnout (Waadt & Acker, 2013) is composed of 11 chapters and contains ACT principles, techniques and exercises. Chapters were assigned in six parts so that the book could be completed in six weeks. Part I includes psychoeducation about burnout, stress and ACT. Part II guides readers in identifying undesirable experiences and introduces defusion from unhelpful thoughts and rules. Part III introduces mindfulness, acceptance and examines the consequences of experiential avoidance (i.e., attempting to escape from aversive internal or

external stimuli) in the short and long term. Part IV introduces the self-as-context perspective and explores how one's self-concepts may increase inflexible behavior and introduces committed action (e.g. the ability to flexibly persist in actions guided by values) as an alternative to experiential avoidance. Part V explores barriers to committed action, includes exercises to set concrete goals that are consistent with values and introduces self-compassion. Audio instructions for mindfulness exercises and worksheets were available as referenced in the book.

Measures

All measures were assessed online. In general, assessing questionnaires via internet does not seem to change their psychometric criteria (Hedman et al., 2010). All primary, secondary and ACT process measures were assessed at baseline, post-assessment, end-of-intervention and follow-up.

Adherence

Adherence variables were assessed by participants at end-of-intervention assessments and consisted of: The percentage of the book participants read (assessed on a continuous scale from 0 to 100%), frequency of exercises utilized, quality of completed exercises and helpfulness of exercises (assessed on a 7-point Likert scale from 0 (not at all) to 6 (very much/often)).

Additionally, seven different comprehension quizzes that assessed objective understanding of the chapter's content were administered. Each included 10 items about the assigned chapters of that week. The immediate intervention group and the waitlist group with weekly assessments completed quizzes within the weekly assessments during the intervention. The waitlist group without weekly assessments completed all quizzes at the end-of-intervention-assessment.

Primary outcomes

The degree to which individuals perceive their lives as overloading, unpredictable and uncontrollable was assessed with the Perceived Stress Scale (PSS; Cohen et al., 1983). In the present study 10 items were rated on a 5-point Likert scale resulting in scores that range between 0 and 40. Higher scores indicate higher levels of perceived stress. The PSS has shown substantial

validity and reliability (Cohen et al., 1983). In the present study Cronbach alpha ranged from .84 to .90 over the four assessments.

Burnout was measured with the Maslach Burnout Inventory – General Survey (MBI-GS; Schaufeli, Leiter, Maslach, & Jackson, 1996). The MBI-GS is a self-report instrument that assesses three facets of burnout: exhaustion, cynicism and personal efficacy. Higher scores indicate higher burnout symptoms except for personal efficacy where lower scores indicate higher burnout symptoms (1–6 points). The MBI-GS has demonstrated satisfactory psychometric properties (Leiter & Schaufeli, 1996). The three-factor structure of the MBI-GS has been confirmed in paper-pencil version (Roelofs, Verbraak, Keijsers, de Bruin, & Schmidt, 2005). In this study, Cronbach alpha ranged from .82 to .91 for emotional exhaustion, .75 to .86 for cynicism and .73 to .83 for personal efficacy over the four assessments.

Secondary outcome

Additional measures targeting depressive symptomatology and well-being and emotion regulation were included.

Depression symptoms according to DSM-IV criteria were measured by the Beck Depression Inventory (BDI-II; Beck et al., 1996), consisting of 21 groups of four statements reflecting no to severe depression assesses general depression severity (0–63 points). Psychometric properties include good internal consistency, test-retest reliability and good validity in clinical and nonclinical samples (Kühner, Bürger, Keller, & Hautzinger, 2007). In the presents study, cronbach alpha ranged from .87 to .93 over the four assessments.

Subjective well-being was assessed with the Mental Health Continuum – Short Form (MHC-SF; Keyes, 2005). The MHC-SF measures well-being on a total and three subscales: emotional, psychological and social well-being. For each aspect of well-being a mean score was computed (1–6). Higher scores indicate greater emotional, social and psychological well-being. The MHC-SF has demonstrated good psychometric properties across various age groups and

nations (Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011). In the present study, cronbach alpha ranged from .84 to .87 for emotional, .86 to .91 for psychological and .79 to .90 for social well-being over the four assessments.

The impact of difficult emotions on an individuals daily life are measured with the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). The 36 items are rated on a 5-point scale ranging from 1 (almost never) to 5 (almost always). Higher scores indicate greater emotion dysregulation (36–180). An example item is "When I'm upset, I feel like I am weak." Preliminary findings have shown good psychometric properties (Gratz & Roemer, 2004). Cronbach alpha ranged from .93 to .96 in the present study over the four assessments.

ACT Processes

Included measures for specific processes assumed to be active in ACT were psychological flexibility, cognitive fusion and different facets of mindfulness:

Psychological flexibility was assessed with the Acceptance and Action Questionnaire II (AAQ-II; Bond et al., 2011). Seven items are rated on a 7-point Likert scale resulting in scores that range from 7 to 49 with lower scores reflecting higher psychological flexibility. Item 1, for example, reads "My painful experiences and memories make it difficult for me to live a life that I would value." The AAQ-II (Fragebogen zu Akzeptanz und Handeln II (FAH-II); Hoyer & Gloster, 2013) has shown good internal consistency and test-retest reliability (Gloster, Klotsche, Chaker, Hummel, & Hoyer, 2011). Cronbach alpha ranged from .88 to .93 in the present study over the four assessments.

The process of psychological flexibility, referring to core processes of psychological flexibility and focusing on the overriding behavioral abilities of being open and engaged were measured with the Open and Engagement State Questionnaire (OESQ). The purpose of the OESQ was to use simple wordings to improve comprehensibility. Its items focus on processes rather than emotional outcomes by asking for example how much influence emotions had on behavior instead

of asking if one is afraid of ones emotions. The wording specificity was attempted to be increased by providing examples and specific process and situation clarifications. An example item is 'How much effort did you put into trying to make your stressful feelings & emotions or thoughts disappear (e.g., suppress them, distract yourself or seeking courage/reassurance from someone else)?'. Lower scores indicate higher psychological flexibility (0–40 points). Cronbach alpha ranged from .59 to .84 in the present study over the four assessments.

Cognitive fusion was assessed with the Cognitive Fusion Questionnaire (CFQ; Gillanders et al., 2014) measures fusion and has demonstrated good psychometric properties (Gillanders et al., 2014). An example item is "My thoughts cause me distress or emotional pain". Cronbach alpha ranged from .92 to .96 in the present study over the four assessments.

Mindfulness was measured with the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004). The KIMS is a self- report inventory assessing four aspects of mindfulness skills including observing, describing, acting with arwareness and accepting without judging. Higher scores indicate higher mindfulness. An example item is "I notice when my moods begin to change". The KIMS has shown good internal consistency and adequate to good test-retest reliability (Ströhle, Nachtigall, Michalak, & Heidenreich, 2010). Cronbach alpha ranged from .86 to .90 for observing, .94 to .96 for describing, .77 to .84 for acting with awareness and .88 to .91 for accepting without judging in the present study over the four assessments.

Data analytic strategy

Statistical Package for the Social Sciences (SPSS) version 22.0 was used for all data analyses. The α level for statistical significance for all analyses was defined as 0.05.

Because per protocol analyses can result in biased results we used linear mixed models (Fitzmaurice, Laird, & Ware, 2004) for intent-to-treat analysis of outcome measures. These analyses lead to more efficient and less biased results compared with complete case analyses or analyses in which missing values have been imputed prior to the analysis using the last observation

carried forward method (Lane, 2008). Further, in linear mixed models participants with missing outcomes are not omitted from the analyses thanks to the maximum likelihood approach used therein.

In the first model we tested the effectiveness of the self-help intervention during intervention for the immediate intervention group relative to the waitlist group (hypothesis 1). This model contained condition as a between-groups effect and time (baseline, post-assessment) as within-subjects effect, including a random intercept. The two waitlist groups were combined, as analyses revealed no significant difference between waitlist groups for any of the analyzed outcome measures at post-assessment, except for social well-being (results available on request). The inclusion of an interaction between time and intervention allowed us to test for a differential effect between the immediate intervention group and the waitlist group. Effect sizes were calculated by the formula for growth models as suggested by Feingold (2009). Power analyses indicated that 128 participants would be sufficient to obtain a power of 0.8 across analyses, assuming an alpha level of .05 (Cohen, 1988).

Among completers clinical significance was computed for primary outcome measures according to a model of Jacobson and Truax (1991). Firstly, this model suggests usage of a reliable change index (RC), to determine whether change is statistically reliable beyond measurement error. Secondly, crossing of a cut-off point is required for participants to be classified "recovered". A negative change from pre- to post-assessment that exceeded the RC was determined a reliable deterioration. As cut-off score the mean of a well functioning normal population (PSS: Cohen & Janicki-Deverts, 2012; MBI-GS: Lindblom, Linton, Fedeli, & Bryngelsson, 2006) and of the sample of the current study was calculated. For analyses of clinically significant change the MBI-GS was rescaled from 1-6 to 0-6 to compare it to existing norms. The following cutoffs were used on the primary outcome measures: for the PSS, 21.8, RC = 4.0; for the MBI-GS exhaustion, 3.7, = 0.7; for the MBI-GS cynicism, 2.7, RC = 1.3; and for the MBI-GS personal efficacy, 4.4, RC =

0.9. Differences in proportion of clinically significant changes between the groups were analyzed with chi-square tests or fisher's exact test when assumptions of chi- squared were not met.

In a second model we investigated whether gains were maintained (hypothesis 2). As participants in the waitlist groups received the intervention after the waiting period, we followed the combined group over time of the intervention. For those outcomes where the groups exhibited comparable trajectories from baseline (post-assessment was used as a re-assessed baseline for the waitlist group) to follow-up (no group x time interaction) this model contained the two main effects for group and time but no interaction between them. It allowed us to test for differences among the three time points, specifically whether there were improvements between baseline and follow-up and between end-of-intervention and follow-up.

Results

Participant Enrollment and Sample Characteristics

Figure 1 displays the flow of participants through the study. 133 individuals were included in the study and randomized into the immediate intervention or waitlist group. Of these, 14 reported starting psychotherapy or clinically significant suicidal intent during the course of the study and were therefore excluded. Thus, the final sample consisted of 119 participants (61 in the immediate intervention and 58 in the waitlist group). Demographic characteristics and the areas of occupation of the sample are presented in Table 1.

[Insert table 1 about here]

Attrition

Dropout occurred when (a) participants stopped completing assessments and did not report back upon request that they were still interested in participation in the study or (b) participants actively reported that they did not want to continue. Among the 119 participants, 17.6% (n = 21) dropped out prior to study conclusion. Of these, 7.6% (n = 9) dropped out of the immediate intervention

group and 10.1% (n = 12) dropped out of the waitlist group. Groups did not differ in dropout rates $\chi^2(1, N = 119) = .72$, $p = .40$. Reasons and timing for attrition are presented in Figure 1.

[Insert figure 1 about here]

Adherence

Adherence variables were only assessed for study completers (n = 98). The average percentage of correct answers in the quiz was M = 74.2% (SD = 9.78) and participants read M = 91.0% (SD = 15.86). On a Likert scale from 0 (not at all) to 6 (very much/often), the average frequency of completing the exercises in the book was M = 3.09 (SD = 1.50); the average estimation of quality of completing the exercises was M = 3.74 (SD = 1.27) and the average rated helpfulness of exercises was M = 4.27 (SD = 1.36). The percentage of correct answers on comprehension quizzes was not correlated with any changes in the primary outcome variables from baseline to end-of-intervention, in the combined sample (all $r(99) < .05$, all p's > .07). Frequency of completing exercises and helpfulness of exercises were correlated with improvements from baseline to end-of-intervention in all primary outcomes ($r(100) > .22$, all p's < 0.05) except for cynicism ($r(100) < -.06$, all p's > 0.06). We found a high correlation between quality of completing exercises and helpfulness of exercises ($r(102) = 0.65$, $p < .001$), but no relationship between the percentage of correct answers in the quiz and the frequency ($r(99) = -0.09$ $p = .36$), quality ($r(99) = 0.07$, $p = .50$), and helpfulness of completing exercises ($r(99) = 0.05$, $p = .65$).

Intervention Effectiveness (immediate intervention vs. waitlist group: Hypothesis 1)

To examine the effectiveness of the self-help book the temporal course of the immediate intervention group and waitlist group were compared between baseline and post-assessment but not at follow-up due to the study design.

Primary outcome

At post-assessment, the immediate intervention group improved significantly more than the waitlist group in terms of perceived stress (PSS: d = 0.9) and all dimensions of burnout: exhaustion

(MBI-GS-E: $d = 0.8$), cynicism (MBI-GS-C: $d = 0.5$) and personal efficacy (MBI-GS-PE: $d = 0.5$). Details are presented in the upper part of Table 2.

Secondary outcome and ACT processes

The secondary outcome measures targeted depressive symptomatology, well-being, and ACT-specific process measures. The immediate intervention group improved significantly more than the waitlist group in terms of depression (BDI-II: $d = 0.6$), overall well-being (MHC total: $d = 0.4$) and psychological well-being (MHC-PWB: $d = 0.4$). No differences between the immediate intervention and the waitlist group were found for social and emotional well-being (MHC-SWB: $d = 0.3$ and MHC-EWB: $d = 0.2$) and emotion regulation skills (DERS: $d = 0.3$).

With respect to the ACT-specific process measures, the immediate intervention group improved significantly more than the waitlist group in terms of psychological flexibility (AAQ-II: $d = 0.4$), process of psychological flexibility (OESQ: $d = 0.8$), cognitive fusion (CFQ: $d = 0.5$) and some mindfulness skills (describing: $d = 0.2$ and acting with awareness: $d = 0.4$ (KIMS)). No differences were found for other mindfulness skills (observing: $d = 0.1$ and accepting without judging: $d = 0.2$ (KIMS)). Further details are presented in the lower part of Table 2.

Associations between the various ACT processes at baseline and between changes in ACT processes and changes in primary outcome variables during the intervention are indicated in the supplemental online material.

[Insert table 2 about here]

Clinically significant change

The proportion of significantly improved participants on the primary outcome measures can be found in table 3. A significantly greater proportion of the immediate intervention group than of the waitlist group met the criteria for significantly clinically recovery for stress and all burnout subscales (all $p < .05$). The immediate intervention group and waitlist group did not differ in the proportion of deteriorations for stress, exhaustion or cynicism (all $p > .6$) but differed in the

proportion of deteriorations for personal efficacy ($p < .05$) with more participants deteriorating in the waitlist compared to the immediate intervention group.

[Insert table 3 about here]

Within-Group Change and Maintenance of Gains following the Intervention (Hypothesis 2)

To examine whether gains were maintained in the follow-up we combined immediate intervention and waitlist groups after they received the intervention and compared end-of-intervention assessment and follow-up. Combination of the groups was warranted, as we found no difference in temporal trajectories between the three groups from baseline to follow-up (i.e. no group x time interaction), except for the process of psychological flexibility (OESQ; $F(3, 99) = 2.6$, $p = .04$). Thus, results refer to the combined group, except for the analysis of the process of psychological flexibility.

Analyses revealed no significant group effect for any of the outcome variables except for the mindfulness skill observing (KIMS; $F(1, 112) = 5.96$, $p = .02$) and emotion regulation skills (DERS; $F(1, 115) = 4.2$, $p = .04$). Across all primary and secondary variables and ACT processes, values at end-of-intervention and follow-up were statistically improved compared to baseline (see Table 4). All primary outcome variables (perceived stress (PSS) and exhaustion, cynicism and personal efficacy (MBI-GS)) continued to significantly improve between end-of-intervention and FU. Furthermore, the following secondary outcome variables and ACT processes continued to improve between end-of-intervention and FU: depression (BDI-II), well-being and emotional well-being (MHC-SF), emotion regulation (DERS), psychological flexibility (AAQ-II), cognitive fusion (CFQ), and describing and accepting without judging (KIMS). Improvements in psychological and social well-being (MHC-SF) and observing and acting with awareness (KIMS) remained stable. The process of psychological flexibility (OESQ) only continued to improve for the immediate intervention but not the former waitlist group. No variable demonstrated statistically significant worsening between end-of-intervention and FU. Details are displayed in table 4.

[Insert table 4 about here]

Discussion

To our knowledge, this study is the first randomized controlled trial examining the effectiveness of a self-help intervention based on ACT without any therapist contact for burnout and perceived stress in a sample with a wide range of occupations. Results indicate that a self-help intervention based on ACT without any therapist contact produced substantial improvements on primary outcomes of perceived stress and burnout, as well as on depression and psychological flexibility, with moderate to large controlled (vs. waitlist) effect sizes for perceived stress (d = 0.9), burnout (d = 0.5–0.8), depression (d = 0.6) and a process measure of psychological flexibility (d = 0.8).

These results are similar in magnitude to previous studies with more therapist contact, e.g. a face-to-face group intervention for the treatment of stress (d = 0.8) and burnout (d = 0.3–0.5) using ACT (Brinkborg et al., 2011); and comparable to the effect reported in a meta-analysis of occupational stress management interventions across all studies (d = 0.7) and specifically for cognitive-behavioral interventions (d = 1.0) (Richardson & Rothstein, 2008).

Interestingly, we found at least medium effects also for all components of burnout. In contrast, a recent meta-analysis of controlled interventions targeting burnout found only a small effect for emotional exhaustion and no effect for depersonalization and personal accomplishment (Maricutoiu, Sava & Butta, 2016).

Various factors may have contributed to the present findings. First, the intervention type may be especially helpful for symptoms of burnout. Mindfulness and values-based processes have been found to have a stronger and more consistent relationship with burnout as compared to work-site factors (Vilardaga et al., 2011). Interventions that directly target mindfulness and values may be especially helpful in reducing components of burnout. Cynicism, for example, has been defined as gaining emotional and cognitive distance from and developing indifference about exhausting or

discouraging work demands and is assumed to function as a coping strategy (Maslach et al., 2001). From an ACT perspective, this behavior could be conceptualized as avoiding or attempting to control internal stimuli, which may inadvertently increase distress and lead to further behavior incongruent with one's values. ACT builds awareness of how this coping strategy functions and provides skills needed to change (e.g., acceptance, defusion) while clarifying and building up behaviors needed to realign and strengthen their values. Another factor may be related to the diverse composition of our sample. In samples consisting of workers of the same company, there may be organizational characteristics and contingencies (such as structure and culture) that systematically contribute to subscales of burnout, which are not present across the entire sample in our study.

Clinically significant change was observed in a substantial proportion of the immediate intervention group for stress (53%) and exhaustion (30%), but only in a smaller proportion for cynicism (21%) and personal efficacy (15%). More participants in the immediate intervention group met criterion for recovery of stress and all burnout subscales compared with the waitilist group. Importantly, more participants in the waitlist group (12.5%) reported deterioration in personal efficacy compared to the immediate intervention group (0%). The rate of clinically significant change for stress was equal to rates reported in a guided web-and mobile-based stress management training (Heber, Lehr, Ebert, Berking, & Riper, 2016) and in a brief, face-to-face stress management intervention (Brinkborg et al., 2011). For burnout, rates for reliable change appear higher than those reported in earlier studies of web-based self-help interventionn (Geraedts, Kleiboer, Wiezer, van Mechelen, & Cuijpers, 2014; van Straten, Cuijpers, & Smits, 2008).

At 3-month follow-up, all outcomes were improved compared to baseline. All intervention gains in the primary outcomes (i.e., perceived stress, exhaustion, cynicism and personal efficacy) continued to improve in the follow-up period. Secondary outcome variables also continued to improve, including depression, general well-being, emotional well-being and emotion regulation

and ACT processes including psychological flexibility, cognitive fusion and the mindfulness facets describing and accepting without judging. These changes suggest that participants also experienced subjective improvements in quality of life and global functioning. We observed no changes for social and emotional well-being and the mindfulness facets observing and acting with awareness throughout the follow-up. None of the variables assessed in this study deteriorated during the intervention or the follow-up period. Although we have not assessed whether participants have continued to study the book during the follow-up period, gains suggest that the participants continued to apply techniques learnt during the intervention in everyday life and further generalized skills across settings and situations.

Given that ACT is a mindfulness-based approach it was somewhat surprising that significant between-group effects were only found for the subscales of 'acting with awareness' and 'describing' but not 'accepting without judging'. During the follow-up, however, we found significant within-group improvements in 'accepting without judging'. Accepting without judging not only requires present-moment awareness to notice when aversive affects, cognitions or sensations appear but also to non-judgmentally acknowledge them (Baer et al., 2004). Consequently it may be that this attitudinal aspect requires more experience and changes take more time to appear. This may be particularly applicable to self-help approaches, because facilitation via moment-to-moment interactions between therapist and patient is not possible.

Questions of treatment adherence are always important in clinical studies. In the present study, participants' reported frequency and helpfulness of exercises were associated with changes in primary variables, with a high correlation between quality of completing exercises and helpfulness of exercises. We found, however, no relationship between the percentages of correct answers on comprehension quizzes and improvements in primary outcome variables. This could point to the greater importance of exercise-related adherence variables for improvements compared to objective knowledge about ACT processes.

A self-help book has the potential to help individuals in need and reduce geographic and financial barriers and can be implemented in various settings and disseminated by various providers. However, there are few publically available self-books that have been examined and even fewer that have been evaluated without therapist contact. Our findings are promising, given that a stand-alone intervention without any therapist contact is cheap, enhances access to evidence-based care and can be disseminated broadly.

Processes such as support for and identification with other group members or therapist alliance have a positive effect on changes (Marziali, Munroe-Blum, & McCleary, 1997). As we controlled for these factors and still observed positive effects, the benefit of the combination of ACT and a self-help book is underscored. This importance is accentuated by the fact that intervention groups are not always readily available. Our findings are in keeping with research on low-intensity mindfulness and acceptance-based self-help interventions that reported significant benefits (Cavanagh, Strauss, Forder, & Jones, 2014). Results also provide support for earlier studies, which showed the effectiveness of self-help interventions without therapist contact for e.g. stress, depression or enhancement of psychological flexibility for both cognitive-behavioral therapy (Clarke et al., 2005; Morledge et al., 2013) and ACT (Jeffcoat & Hayes, 2012; Muto, Hayes, & Jeffcoat, 2011; Ritzert et al., 2016).

Several limitations of this study should be noted. First, although we included no therapist support, participants received study-specific structure such as assessments and reminder emails. This may imply that another person is monitoring the process and would not typically be available to readers of a self-help book under real-world, no-study conditions. However, the inclusion of some form of structure is inevitable in a study, considering that an assessment of some sort has to occur to gain information about change in participants. Second, as we did not include an active intervention as comparison, we cannot rule out non-specific effects. Other interventions such as CBT have been shown to increase psychological flexibility (Gloster et al., 2014). Similarly, a health enhancement

program has been shown to increase mindfulness (Goldberg et al., 2016). Thus, it is unknown whether and to what degree non-specific roles impacted results. An active treatment or placebo should be used as comparison to control for non-specific effects in future studies. Third, we were reliant on participants for all of the information provided, as we did not have any direct contact. That said, this was one of the aims of the study and also one of its strengths. Fourth, due to the lack of a waitlist comparison group for follow-up we cannot preclude that the effect between end-of-intervention and follow-up was caused by another factor than the intervention. Fifth, individuals reading and responding to the advertisement in a health insurance newsletter may potentially have special characteristics that limit the generalizability of the findings. Sixth, work characteristics such as job satisfaction, overload, autonomy, conflicts and objective work behavior (e.g. work performance) have not been assessed but may be important indicators associated with burnout and should be included in future studies. Finally, although findings at 3-month follow-up are promising, even longer follow-ups are needed to determine whether effects are maintained and skills can be applied to participants' future challenges.

Notwithstanding these limitations, we conclude that ACT delivered through a self-help book without therapist contact can be beneficial for individuals with at least moderate levels of perceived stress across a wide range of professions. At the present time, the clinical recommendation would be to recommend utilization of a self-help book as a means to reduce suffering, especially when other treatment options are not readily available. To the author's knowledge, this is the first study that has tested an ACT self-help book intervention for burnout in a sample not consisting of a specific occupational category or organization. Broad dissemination of self-help material may help to reach vulnerable populations and overcome stigmatization of traditional mental health care, an issue that has been shown to limit participation in mental health programs (Pyne et al., 2004).

Further research is needed to examine the underpinning mechanism of the effects of ACT self-help interventions to refine and optimize procedures. It is also important that future research identifies characteristics of those who benefit from such an approach and circumstances that are most effective for psychological self-help interventions without therapist contact.

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Table 1

Summary of characteristics of study participants

Characteristic	Full Sample (*N* = 119)		IIG (n = 61)		WL (*n* = 58)	
	N	%	*n*	%	*n*	%
Age *(M SD)*	43.8	10.1	40.9	6.7	46.8	9.7
Perceived stress (*M SD*)	26.5	4.5	26.5	4.6	26.5	4.5
Sex						
Male	36	30	19	31	17	29
Female	83	70	42	69	41	71
Highest education level						
Compulsory school	2	2	1	2	1	2
Upper secondary education	78	66	42	69	36	62
Higher education	37	31	17	28	20	35
Other education	2	2	1	2	1	2
Employment						
<50%	12	10	5	8	7	12
51-75%	14	12	5	8	8	14
76-100%	85	71	47	77	39	67
Unemployed	8	7	4	7	4	7
Classification of Occupation[a]						
Agriculture, forestry, farming, and gardening	2	2	2	3	0	0
Production of raw materials and goods, and manufacturing	7	6	4	7	3	5
Construction, architecture, surveying and technical building services	2	2	1	2	1	2
Natural sciences, geography and informatics	7	6	4	7	3	5
Traffic, logistics, safety and security	4	3	1	2	3	5
Commercial services, trading, sales, the hotel business and tourism	20	17	11	18	9	16
Business organisation, accounting, law and administration	22	19	14	23	8	14
Health care, the social sector, teaching and education	37	31	20	33	17	29
social sciences, economics, media, art, culture, and design	8	7	0	0	8	14
No information regarding occupation	10	8	4	7	6	10
Social class[b]						
Lower	44	37	20	33	24	41
Middle	64	54	36	59	28	48
Upper	11	9	5	8	6	10
Marital status						
Married	72	61	36	59	36	62
In a relationship	24	20	13	21	11	19
Divorced/widowed	6	5	2	3	4	7
Never married	17	14	10	16	7	12

Note. IIG = Immediate intervention group; WL = Waitlist group PSS = Perceived Stress Scale.

[a] Occupations were classified according to the German Classification of Occupations 2010 (Bundesagentur für Arbeit, 2011)

[b] Social class according to self-assessement

Table 2

Primary and secondary outcomes at baseline (combined sample) and post, mean differences between baseline and post-assessment, effect sizes and test-statistics

	Baseline[a]		Post				Mean difference[b]			
			IIG		WL		IIG	WL		
Outcome	*M*	*SE*	*M*	*SE*	*M*	*SE*	*n* = 61	*n* = 58	*t* (*df*)[c]	*d*[d]
Primary Outcomes										
Perceived stress	26.07	0.49	20.22	0.69	24.72	0.68	–5.84	–1.35	–4.89 (188) ***	0.9
Burnout										
Exhaustion	4.79	0.07	4.19	0.10	4.86	0.10	-0.65	0.05	–5.37 (155) ***	0.8
Cynicism	3.81	0.10	3.46	0.12	4.00	0.12	-0.35	0.19	–3.86 (143) ***	0.5
Personal efficacy	4.34	0.07	4.55	0.09	4.19	0.09	0.21	–0.15	3.79 (139) ***	0.5
Secondary Outcomes										
Depression symptoms	22.89	0.89	15.38	1.14	20.67	1.12	–7.51	–2.22	–3.96 (149) ***	0.6
Well-being	2.03	0.09	2.61	0.12	2.28	0.11	0.58	0.25	2.49 (146) *	0.4
Psychological well-being	2.26	0.10	2.83	0.13	2.44	0.13	0.57	0.18	2.46 (155) *	0.4
Social well-being	1.65	0.10	2.27	0.13	1.96	0.13	0.61	0.31	1.93 (152)	0.3
Emotional well-being	2.20	0.10	2.75	0.13	2.47	0.13	0.54	0.26	1.77 (152)	0.3
Difficulties in emotion regulation	101.16	2.05	91.24	2.72	97.84	2.66	–9.92	–3.32	–1.97 (159)	0.3
ACT Processes										
Psychological flexibility	27.47	0.75	24.00	0.95	27.30	0.93	–3.48	–0.17	–2.99 (145) **	0.4
Process of psychological flexibility	25.31	0.68	17.52	0.99	22.62	0.96	7.79	–2.70	–3.80 (204) ***	0.8
Cognitive fusion	115.21	1.95	101.02	2.49	111.14	2.45	–14.19	–4.08	–3.48 (147) **	0.5
Mindfulness										
Observing	37.19	0.78	39.56	0.96	38.29	0.95	2.37	1.10	1.2 (137)	0.1
Describing	23.59	0.68	25.59	0.81	23.90	0.80	2.00	0.31	2.0 (132) *	0.2
Acting with awareness	27.60	0.53	31.30	0.71	28.92	0.69	3.70	1.32	2.7 (160) **	0.4
Accepting without judging	28.35	0.63	31.22	0.82	29.89	0.81	2.86	1.53	1.33 (156)	0.2

Note. IIG = Immediate intervention group; WL = Waitlist group. Values denote estimates from a linear mixed mode. Post-assessment denotes end of intervention / end of waitlist, respectively.

[a] The model assumes equal baseline values for both groups, which is a reasonable assumption for a randomized controlled study (Fitzmaurice, Larid, & Ware, 2004).

[b] Mean differences are calculated by subtracting the mean value at baseline from the mean value at post-assessment ($M_{post} - M_{baseline}$).

[c] *t*- values refer to the interaction effect time x intervention i.e. whether mean differences for the two conditions differ from each other.

[d] Standardized mean between-group difference at post-asessment using the raw baseline standard deviation in the calculation.

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

Table 3
Percentage of participants who made a clinically significant change on the primary outcomes in each group

	Reliably improved		Recovered and reliably improved		Reliable deterioration	
	IIG (*n*=53)	WL (*n*=56)	IIG (*n*=53)	WL (*n*=56)	IIG (*n*=53)	WL (*n*=56)
Variable	% (*n*)	% (*n*)	% (*n*)	% (*n*)	% (*n*)	% (*n*)
Perceived stress	69.8 (37)	28.6 (16)	52.8 (28)	12.5 (7)	9.4 (5)	12.5 (7)
Burnout						
Exhaustion	50.9 (27)	12.5 (7)	30.2 (16)	8.9 (5)	13.2 (7)	10.7 (6)
Cynicism	22.6 (12)	1.8 (1)	20.8 (11)	1.8 (1)	5.7 (3)	8.9 (5)
Personal efficacy	20.8 (11)	1.8 (1)	15.1 (8)	0.0 (0)	0.0 (0)	12.5 (7)

Note. Clinically significant change was determined by Jacobsen and Truax' (1991) c Criterion to establish whether the score of a particular case fall within the "recovered distribution"; IIG = Immediate intervention group; WL = Waitlist group.

Table 4
Mean differences from baseline to 3-month follow-up (FU) and from end-of-intervention to FU (N=119)

Outcome	Baseline		End-of-intervention		FU		*M* difference between baseline and FU	*M* difference between end-of-intervention and FU
	M	*SE*	*M*	*SE*	*M*	*SE*		
Primary Outcomes								
Perceived stress	25.40	0.46	19.46	0.63	17.51	0.65	-7.88 ***	-1.946 **
Burnout								
Exhaustion	4.80	0.08	4.09	0.10	3.87	0.11	-0.93 ***	-0.222 **
Cynicism	3.90	0.10	3.43	0.11	3.22	0.11	-0.67 ***	-0.202 *
Personal efficacy	4.25	0.07	4.55	0.07	4.66	0.07	0.41 ***	0.108 *
Secondary Outcomes								
Depression symptoms	21.82	0.90	14.26	1.03	11.26	1.00	-10.55 ***	-2.99 ***
Well-being	2.15	0.09	2.67	0.11	2.88	0.10	0.73 ***	0.2 *
Psychological well-being	2.34	0.10	2.94	0.11	3.11	0.11	0.77 ***	0.18
Social well-being	1.80	0.10	2.28	0.12	2.43	0.11	0.64 ***	0.15
Emotional well-being	2.33	0.10	2.81	0.11	3.16	0.11	0.83 ***	0.36 ***
Difficulties in emotion regulation	99.96	1.98	88.35	2.34	83.58	2.17	-16.38 ***	-4.77 **
ACT Processes								
Psychological flexibility	27.56	0.77	23.46	0.79	21.70	0.83	-5.86 ***	-1.76 **
Process of psychological flexibility IIG	25.90	0.89	17.71	1.24	14.93	1.21	-10.97 ***	-2.78 *
Process of psychological flexibility WL	22.41	0.92	16.31	1.28	16.89	1.27	-5.37 ***	0.74
Cognitive fusion	113.42	1.81	99.28	2.38	92.17	2.55	-21.24 ***	-7.11 ***
Mindfulness								
Observing	37.72	0.82	40.63	0.79	40.67	0.85	2.94 ***	0.04
Describing	23.67	0.68	26.00	0.73	26.98	0.72	3.32 ***	0.98 **
Acting with awareness	28.18	0.53	31.09	0.63	31.62	0.54	3.44 ***	0.53
Accepting without judging	29.15	0.65	31.66	0.63	33.00	0.66	3.85 ***	1.34 **

Note. Values denote estimates from a linear mixed mode. IIG = Immediate intervention group; WL = Waitlist group.

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

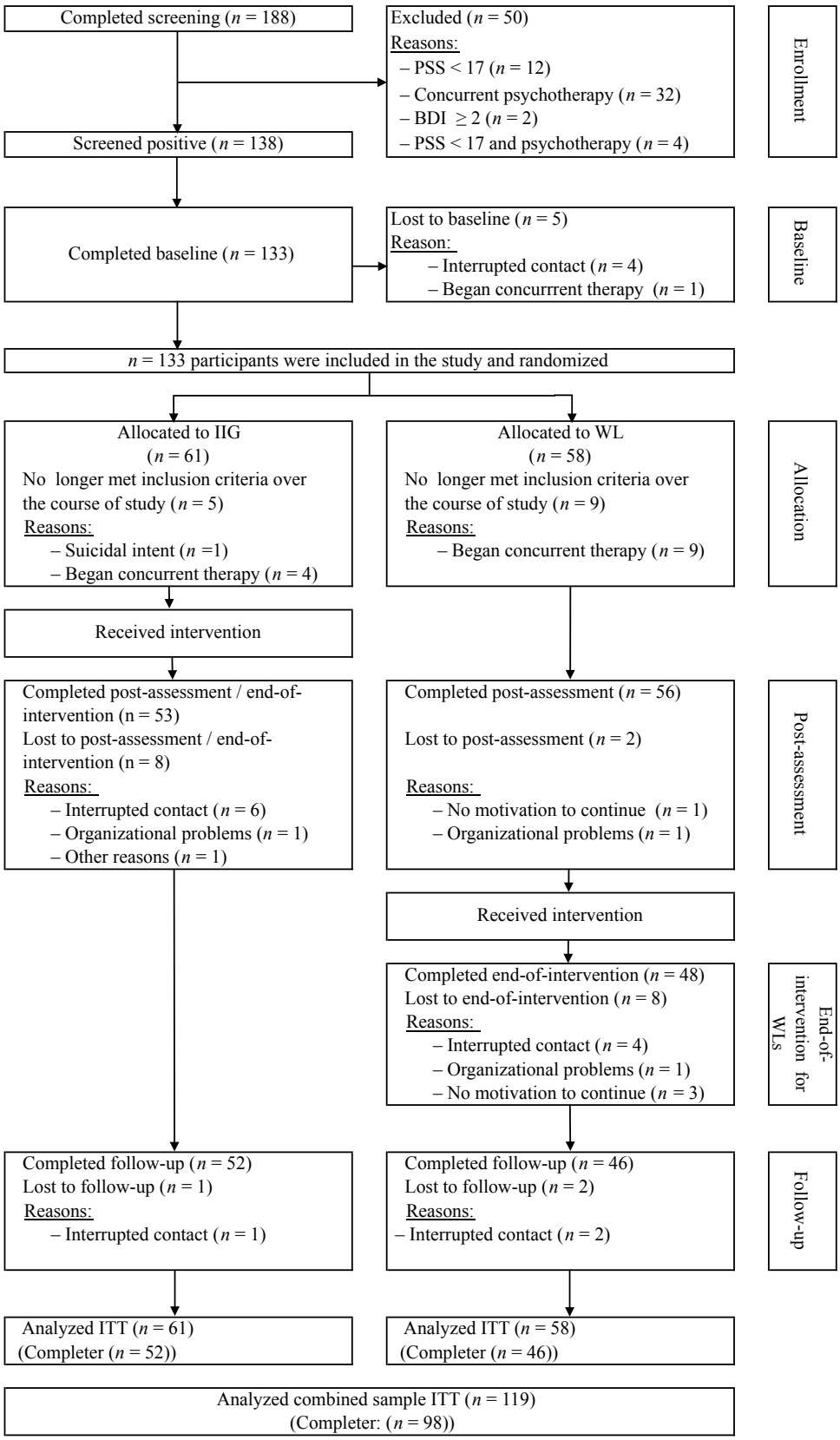

Figure 1. Participants flow through the study. IIG = Immediate intervention group; WL = Waitlist group; ITT: Intention to treat.

Supplemental material:

Table: CONSORT Checklist

Section/Topic	Item	Description	Reported on Page #
Title	1a	Identification as a randomised trial in the title	1
Abstract	1b	Structured summary of trial design, methods, results, and conclusions	1
Introduction			
Background	2a	Scientific background and explanation of rationale	2--4
Objectives	2b	Specific objectives or hypotheses	4
Methods			
Trial design	3a	Description of trial design (such as parallel, factorial) including allocation ratio	6
Changes to trial design	3b	Important changes to methods after trial commencement (such as eligibility criteria), with reasons	n.a.
Participants	4a	Eligibility criteria for participants	5
Study settings	4b	Settings and locations where the data were collected	4
Interventions	5	The interventions for each group with sufficient details to allow replication, including how and when they were actually administered	6
Outcomes	6a	Completely defined pre-specified primary and secondary outcome measures, including how and when they were assessed	6--9
Changes to outcomes	6b	Any changes to trial outcomes after the trial commenced, with reasons	n.a.
Sample size	7a	How sample size was determined	11
Interim analyses and stopping guidelines	7b	When applicable, explanation of any interim analyses and stopping guidelines	n.a.
Randomisation: sequence generation	8a	Method used to generate the random allocation sequence	6
Randomisation: type	8b	Type of randomisation; details of any restriction (such as blocking and block size)	6
Randomisation: allocation concealment mechanism	9	Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned	6
Randomisation: implementation	10	Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions	6
Blinding	11a	If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes) and how	n.a.
Similarity of interventions	11b	If relevant, description of the similarity of interventions	n.a.
Statistical methods	12a	Statistical methods used to compare groups for primary and secondary outcomes	10−11
Results			
Participant Flow	13a	For each group, the numbers of participants who were randomly assigned, received intended treatment, and were analysed for the primary outcome	Fig. 1
Losses and exclusions	13b	For each group, losses and exclusions after randomisation, together with reasons	Fig. 1
Recruitment	14a	Dates defining the periods of recruitment and follow-up	4
Reason for stopped trial	14b	Why the trial ended or was stopped	n.a.
Baseline Data	15	A table showing baseline demographic and clinical characteristics for each group	Table 1 Table 2
Numbers analysed	16	For each group, number of participants (denominator) included in each analysis and whether the analysis was by original assigned groups	Table 3 Table 4
Outcomes and estimation	17a	For each primary and secondary outcome, results for each group, and the estimated effect size and its precision (such as 95% confidence interval)	Table 2
Binary outcomes	17b	For binary outcomes, presentation of both absolute and relative effect sizes is recommended	Table 3
Ancillary analyses	18	Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory	n.a.
Harms	19	All important harms or unintended effects in each group	n.a.
Discussion			
Limitations	20	Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses	18−19
Generalisability	21	Generalisability (external validity, applicability) of the trial findings	19
Interpretation	22	Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence	15−19
Other Information			
Registration	23	Registration number and name of trial registry	1
Protocol	24	Where the full trial protocol can be accessed, if available	n.a.
Funding	25	Sources of funding and other support (such as supply of drugs), role of funders	20

Table: Zero-order correlations (*N*=119) of ACT processes at baseline

Variables	1	2	3	4	5	6	7
1. Psychological flexibility (AAQ-II)	1	0.52**	0.59**	−.07	−.27**	−.32**	−.38**
2. Psychological flexibility (OESQ)	0.52**	1	0.35**	−.23*	−.29**	−.32**	−.15
3. Cognitive fusion (CFQ)	0.59**	0.35**	1	−.16	−.33**	−.57**	−.68**
Mindfulness (KIMS)							
4. Observing	−.07	−.23*	−.16	1	−.46**	−.26**	−.11
5. Describing	−.27**	−.29**	−.33**	−.46**	1	−.20*	0.02
6. Acting with awareness	−.32**	−.32**	−.57**	.26**	.20*	1	.40**
7. Accepting without judging	−.78**	−.15	−.68**	−.11	0.02	.40**	1

Note. AAQ-II = Acceptance and Action Questionnaire II; OESQ = Open and engagement state questionnaire ; CFQ = Cognitive Fusion Questionnaire; KIMS = Kentucky Inventory of Mindfulness Skills.

Table: Associations between changes in ACT processes and changes in primary outcome variables during the intervention

	BL−End of intervention						
	Psychological flexibility	Process of psychological flexibility	Cognitive fusion	Mindfulness			
BL−End of intervention				Observing	Describing	Acting with awareness	Accepting without judging
Perceived stress	.45**	.58**	.51**	−.38**	−.30**	−.50**	−.30**
Burnout							
Exhaustion	.49**	.41**	.57**	−.44**	−.39**	−.58**	−.27**
Cynicism	.41**	.35**	0.47**	−.40*	−.41**	−.46**	−.19
Personal efficacy	−.14	−.35*	−.24*	0.13	.20*	.21*	0.15

Note. BL = Baseline.