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Acceptance and commitment training focused on repetitive negative thinking for clinical psychology trainees: A randomized controlled trial

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Abstract

This parallel randomized controlled trial evaluated the effect of Acceptance and Commitment Training (ACT) focused on disrupting repetitive negative thinking (RNT) versus a waitlist control (WLC) in clinical psychology trainees. Ninety-four undergraduate, clinical psychology trainees of a Colombian university were invited to participate in the study. Eighty-five trainees agreed to participate and were allocated by means of simple randomization to a group, 6-session RNT-focused ACT intervention or the WLC. The ACT training was based on an online program for emotional disorders. The primary outcomes were measures of emotional symptoms and valued living, whereas process measures were RNT-related measures. All participants completed the study. At posttreatment, repeated measures ANOVA showed that the training was efficacious in reducing emotional symptoms (d = 0.75), depression (d = 0.79), the frequency of behaviors obstructing valued living (d = 0.51), RNT focused on clinical practice (d = 0.89), and general RNT (d = 0.62). Larger effect sizes were obtained by participants showing high levels of emotional symptoms (d = 0.75 to 2.52), with 73.33% of participants obtaining a reliable change in emotional symptoms, and 66.67% a clinically significant change versus 7.14% for both indicators in the WLC condition. The training effects were longitudinally mediated by the reduction of RNT focused on clinical practice at two-thirds of the program. An easy-to-implement RNT-focused ACT training is effective in reducing emotional symptoms and promoting valued living in clinical psychology trainees.

Key words: Acceptance and commitment therapy; Repetitive negative thinking; Clinical psychology trainees; Emotional symptoms; Values.

Acceptance and commitment training focused on repetitive negative thinking for clinical psychology trainees: A randomized controlled trial

1. Introduction

Recent research has shown that professionals in mental health usually suffer from high levels of emotional symptoms and burnout (e.g., McCormack, MacIntyre, O'Shea, Herring, & Campbell, 2018; Simionato & Simpson, 2018). Among this type of professionals, trainees often experience the highest rates of emotional symptoms (Cartwright & Gardner, 2016; Simionato & Simpson, 2018). This might be due to the wide range of stressors usually faced by trainees, which include feelings of incompetence when obtaining unsatisfactory outcomes, having different opinions from their supervisors, realizing discrepancies between their expectations and the real clinical practice, frequent switching between different roles, and additional academic workload (e.g., Cushway, 1992; Cushway & Tyler, 1996; Hill, Sullivan, Knox, & Schlosser, 2007; Kuyken, Peters, Power, Lavender, & Rabe-Hesketh, 2000; Truell, 2001). Indeed, there is empirical evidence that novice clinical psychology trainees show a higher increase of emotional symptoms during the first two months of practice than a student control cohort (Ruiz, Dereix, & Sierra, submitted).

Some studies have explored the psychological factors involved in emotional symptoms and burnout among mental health professionals. Vilardaga et al. (2011) found that experiential avoidance, cognitive fusion, and valued living predicted burnout better than work-site factors among addiction counselors. Similar results were found by Kroska, Calarge, O'Hara, Deumic, and Dindo (2017) in medical students. Specifically, high levels of experiential avoidance significantly predicted depression symptoms, emotional exhaustion and depersonalization, whereas low levels predicted greater personal accomplishment. The inverse pattern of results

was found for values-based behavior: low levels were associated with emotional difficulties, and high levels with accomplishment. Lastly, Dereix, Ruiz, Cardona-Betancourt, and Flórez (submitted) showed that repetitive negative thinking (RNT; Ehring & Watkins, 2008) focused on the clinical practice was a better longitudinal predictor than general RNT and experiential avoidance of the increase of emotional symptoms experienced by novice clinical psychology trainees.

The above-mentioned findings suggest that mindfulness and acceptance-based trainings might be effective in reducing stress in mental health professionals. Indeed, Rudaz, Twohig, Ong, and Levin (2017) found 24 studies that analyzed the effect of this type of interventions including mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1991), mindfulness-based cognitive therapy (MCBT; Segal, Williams, & Teasdale, 2002), mindful self-compassion (MSC; Germer & Neff, 2013), and acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 1999) in mental health professionals. The authors concluded that there is: (a) some preliminary support for MBSR in reducing stress, but mixed evidence for burnout and psychological well-being; (b) MBCT did not show consistent improvements in stress and well-being; (c) MSC showed no consistent effects on stress; and (d) ACT showed consistent results in reducing stress, but was not consistent for burnout and psychological well-being. Among the studies, those testing the effect of ACT trainings used more rigorous methodology. Overall, the conducted studies have shown some positive preliminary evidence, but further studies with better methodology and larger sample sizes are required. Of the 24 studies reviewed by Rudaz et al., only 9 tested the effect of mindfulness and acceptance-based interventions on clinical psychology trainees. The results of these studies were promising, but some mixed effects were found. Importantly, most of the studies showed significant methodological limitations.

The empirical evidence showing the pernicious role of ACT processes (i.e., experiential avoidance, cognitive fusion, and values-based behaviors; Kroska et al., 2017; Vilardaga et al., 2011) and RNT (Dereix et al., submitted) in mental health professionals might indicate a way to improve the psychological trainings designed for them. In this respect, in the last few years, brief RNT-focused ACT interventions have been developed that have shown to be highly effective in emotional disorders (Ruiz et al., 2018; Ruiz, Riaño-Hernández, Suárez-Falcón, & Luciano, 2016).

The RNT-focused ACT interventions were designed by following several analyses based on relational frame theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001), a functional contextual approach to human language and cognition. These analyses emphasized six relevant points (Gil-Luciano, Calderón-Hurtado, Tovar, Sebastián, & Ruiz, 2019; Luciano, 2017; Ruiz et al., 2016; Törneke, Luciano, Barnes-Holmes, & Bond, 2016). Firstly, Ruiz et al. (2016) suggested that RNT in the form of worry and rumination is a predominant experiential avoidance strategy because it is the first reaction when the individual undergoes aversive private experiences. Secondly, RNT tends to prolong and amplify negative affect because it is focused on negative content (Newman & Llera, 2011; Wells, 2009). Thirdly, the extension of negative affect provoked by the engagement in prolonged RNT usually leads to engaging in additional experiential avoidance strategies that are more effective in reducing discomfort (e.g., Caselli et al., 2013; Nolen-Hoeksema, Stice, Wade, & Bohon, 2007; Wells, 2009). Fourthly, the previous engagement in RNT tends to extend the relational networks (or the cognitive contents) involved in the aversive thoughts, which makes experiencing the same or related thoughts that trigger RNT more probable. Fifthly, the individual develops an inflexible pattern of behavior when repeating the previous cycle in response to aversive private experiences, which precludes

engagement in values-based behaviors. Lastly, triggers for RNT are usually organized in hierarchical networks (Gil-Luciano et al., 2019; Luciano, 2017; Ruiz et al., 2016), such that the triggers at the top of the hierarchy symbolically contain the triggers at lower levels of the network. According to the previous analysis, the RNT-focused ACT protocols aim to dismantle unconstructive RNT patterns in response to the trigger at the top of the hierarchical network of triggers.

The current study aims to analyze the effect of an RNT-focused ACT protocol in emotional symptoms and valued living in novice clinical psychology trainees. Due to the expected variability in the participants, we expected that, for participants with low levels of emotional symptoms, the intervention would lead to the prevention of the symptom increase that is often seen in novice trainees and, for participants with high levels of emotional symptoms, to their reduction. A randomized controlled trial (RCT) was conducted to compare the effect of the ACT protocol versus a waitlist control (WLC). The RNT-focused ACT training was based on an online program for emotional disorders (Sierra & Ruiz, submitted) and was implemented in 6 one-hour group sessions. We expected that participants in the RNT-focused ACT group would show less emotional symptoms and higher valued living at posttreatment than the WLC group. Additionally, we expected that changes in RNT focused on the clinical practice at the two thirds of the program would mediate the effect of the intervention on emotional symptoms and valued living. The CONSORT statement (Moher et al., 2010) was followed to guide the reporting of this RCT.

2. Method

2.1. Participants

Eligible participants were undergraduates in Psychology at the beginning of their clinical training. Ninety-four clinical psychology trainees of a Colombian university were invited to participate in this study. All potential participants were undergraduates enrolled in the 9th semester (out of 10) in which they develop their clinical practice. Unlike other countries (e.g., USA), Colombian laws permit undergraduates in Psychology to receive training in clinical psychology and to attend to clients under the guidance of a supervisor. The potential participants were at the beginning of their clinical practice in the Center of Clinical Psychology of the university. This center offers inexpensive psychological treatment to the community. All therapists are students who are individually supervised by a clinical psychologist once a week for 1.5 hours. The students can treat up to 5 patients during the semester.

After explaining the aims of the study, 85 clinical psychology trainees (90.43% of the trainees approached) agreed to participate in the study and signed the informed consent. No exclusion criteria were adopted in this study. The mean age of the participants was 23.38 (*SD* = 2.87; range = 20-33), 79% were women, and most of them were single (87.4%). Participants were compensated with 20,000 Colombian pesos (approximately 6 US dollars) for completing the study at the end of the semester.

As we could not select the number of participants a priori according to a power analysis (i.e., we approached every clinical psychology trainee of the center in a semester), we conducted a sensitivity analysis with G*Power 3.1.9.2 (Faul, Erdfelder, Lang, & Buchner, 2007). In this analysis, we computed the minimum effect size that would be identified as statistically significant with an 80% probability with an alpha error probability of .05 in the option "ANOVA: Repeated measures, between factors." We entered 85 in the total sample size, 2 in the number of groups, 2 in the number of measurements, and 0.5 in the correlation between repeated

measures (this correlation was based on the data from the study by Dereix, Ruiz, Cardona-Betancourt, et al., submitted, which had a sample and timing of basically the same characteristics as in this study). According to this analysis, this study was well suited to detect medium effect sizes (d = 0.53).

2.2. Research design

A parallel, two-arm RCT was conducted. Simple randomization was conducted following a 1:1 ratio with the assistance of the web-based tool Research Randomizer (Urbaniak & Plous, 2013). Participants were randomly allocated to the RNT-focused ACT training (N = 43) or to the WLC (N = 42). The second author generated the random allocation sequence, whereas the first, fourth and fifth authors enrolled the participants. An assistant, who was not involved in the recruitment and the application of the intervention, assigned participants to the interventions.

The ACT training was an adaptation of the web-based RNT-focused ACT intervention for emotional disorders presented by Sierra and Ruiz (submitted). Dependent variables were divided into primary outcome and process outcomes. The primary outcomes were measures of emotional symptoms and valued living, whereas process outcomes were measures of general RNT and RNT focused on the clinical practice. We selected the variable RNT focused on the clinical practice to analyze its potential role as mediator of the training effects because: (a) the main goal of the intervention was to disrupt dysfunctional patterns of RNT, and (b) the PTQ-CPT was shown to be a good longitudinal predictor of emotional symptoms in a study with clinical psychology trainees with similar characteristics (Dereix, Ruiz, Cardona-Betancourt, et al., submitted). Thus, we hypothesized that participants who reduced more RNT focused on the clinical practice at the end of Module 2 of the training (see below) would show greater intervention effects at posttreatment.

2.3. Outcome measures

Depression Anxiety and Stress Scales – 21 (DASS-21; Lovibond & Lovibond, 1995; Spanish version by Daza, Novy, Stanley, & Averill, 2002). The DASS-21 is a 21-item, 4-point Likert-type scale (3 = *applied to me very much. or most of the time*; 0 = *did not apply to me at all*) consisting of sentences describing negative emotional states experienced during the last week. It contains three subscales (Depression, Anxiety, and Stress) and has shown good internal consistency and convergent and discriminant validity. The DASS-21 has good psychometric properties (alpha of .93 in the total scale) in Colombian samples and a factor structure consisting of three correlated factors corresponding to the above-mentioned subscales and a general, second-order factor (Ruiz, García-Martín, Suárez-Falcón, & Odriozola-González, 2017). The hierarchical structure of the DASS-21 allows obtaining a global score on emotional symptoms by summing all items. Mean scores on the DASS-total for a nonclinical sample of 894 participants was 19.36 (*SD* = 12.48), whereas for a sample of 245 clinical participants, it was 26.87 (*SD* = 14.53). In this study, the DASS-21 obtained an alpha of .93 for the total scale. With respect to the subscales, the alphas were .89, .77, and .84, for Depression, Anxiety, and Stress, respectively.

Valuing Questionnaire (VQ; Smout, Davies, Burns, & Christie, 2014). The VQ is a 10-item, 7-point Likert (6 = *completely true*; 0 = *not at all true*) self-report instrument designed to assess general valued living during the past week. The VQ has two subscales: Progress (i.e., enactment of values, including clear awareness of what is personally important and perseverance) and Obstruction (i.e., disruption of valued living due to avoidance of unwanted experience and distraction from values). The Spanish version has shown good psychometric properties. Mean scores obtained on the VQ in Colombia for general population were 19.5 (*SD* = 6.43) for Progress and 11.7 (*SD* = 6.88) for Obstruction, whereas mean scores for a clinical

sample (N = 235) were 17.23 (SD = 6.63) and 15.42 (SD = 7.12), respectively. In this study, the VQ obtained alphas of .84 and .90 for Progress and Obstruction, respectively.

2.4. Process outcomes

Perseverative Thinking Questionnaire (PTQ; Ehring et al., 2011). The PTQ is a 15-item, 5-point Likert (4 = *almost always*; 0 = *never*) self-report instrument that was designed to evaluate the tendency to engage in RNT when facing negative experiences or problems in general (i.e., it is a content-independent self-report). The PTQ has shown excellent internal consistency, high test-retest reliability, and convergent and predictive validity. As there is no Spanish translation of the PTQ, we back-translated it by following the guidelines by Muñiz, Elosua, and Hambleton (2013). Preliminary data from our laboratory indicate that the PTQ possesses excellent internal consistency in Colombia (mean Cronbach's alpha of .96) and a one-factor structure. In this study, the PTQ obtained an alpha of .96.

Perseverative Thinking Questionnaire for Clinical Psychology Trainees (PTQ-CPT; Dereix, Ruiz, Suárez-Falcón, & Flórez, in press). The PTQ-CPT is a 9-item, 5-point Likert (4 = *almost always*; 0 = *never*) self-report instrument that was designed to evaluate the tendency of clinical psychology trainees to engage in RNT concerning issues of the clinical practice. It was based on the PTQ and, as such, it is also a content-independent self-report of RNT. Dereix, Ruiz, Suárez-Falcón, et al. showed that the PTQ-CPT possesses excellent internal consistency (alpha of .93) and a one-factor structure. In this study, the PTQ-CPT obtained an alpha of .91.

2.5. RNT-focused ACT

The RNT-focused ACT program (Sierra & Ruiz, submitted) consists of 3 modules with an approximate duration of 2 hours each (i.e., 6 hours in total) that are designed for application through a website. Each module consists of several videos, audio files, and exercises. The

program was designed for the treatment of emotional disorders. Three hypothetical characters facing a hard time in their lives are introduced in the program to illustrate the concepts of the RNT-focused ACT interventions implemented in previous studies in vis a vis therapy (Ruiz et al., 2016, 2018). In order to maintain the transdiagnostic nature of the intervention, none of the characters shows specific symptomatology; contrarily, the examples are focused on how they relate to their own thoughts and emotions and what choice they are making at every moment (i.e., engaging in RNT and other experiential avoidance strategies or in valued behaviors).

The first module of the intervention is entitled "Knowing the problem and finding solutions" and has the following objectives: (a) Introducing the rationale of the intervention, (b) Identifying the hierarchy of triggers for RNT and core aspects of the RNT process, (c) Identifying experiential avoidance strategies that are a consequence of the RNT process, (d) Introducing and identifying values, (e) Introducing and identifying valued actions, (f) Introducing learning to choose between engaging in RNT or in valued actions as the alternative, and (g) Differentiating experientially the engagement in RNT process from the experience of defusing from thoughts.

The second module is entitled "Developing an observation point of your thoughts." It has the following aims: (a) Illustrating and identifying the RNT process in greater detail, (b) Introducing and practicing the difference between judging and engaging in RNT in response to external events versus taking a nonjudgmental stance towards them, (c) Illustrating how private events are influenced by the context and that engaging in RNT can be under voluntary control, (d) Practicing the skill of noticing the flow of thoughts and focusing attention on a valued behavior, and (e) Promoting a transcendental and coherent perspective of the self.

Lastly, the third module is entitled "Focusing on what really matters" and has the following objectives: (a) Illustrating that values can change and evolve throughout time in the context of a transcendent self, (b) Exploring the long-term consequences of rigidly engaging in RNT versus behaving with flexibility towards one's own values, (c) Establishing goals and objectives that permit advancing towards one's own values, (d) Exploring time management and establishing specific daily activities towards values, (e) Identifying the psychological barriers to advancing toward values and establishing an agenda for several days focused on advancing towards previously defined goals, and (f) Summarizing the main contents of the program.

A more detailed description of the program can be seen in Sierra and Ruiz (submitted).

2.6. Procedure

The procedure of this study was approved by the institutional Ethics Committee and it was conducted between August and October, 2018. The study was presented to potential participants in the first week of the semester (first week of August) during a general induction to the procedures of the Center of Clinical Psychology. They were told that the aim of the study was to analyze the efficacy of a brief ACT training in the emotional adaptation of clinical psychology trainees to their roles. Also, the presentation emphasized that the training would provide them with (a) a different, experiential way of approaching ACT, and (b) tools that they might find helpful during their clinical practice. Participants who signed the informed consent were given a questionnaire package including the measures mentioned above and a form for basic sociodemographic information.

The training began two weeks after the recruitment session. It was conducted in 6 weekly sessions that lasted approximately 1 hour. To increase adherence to the training, the sessions were conducted after the weekly mandatory trainings in assessment and/or intervention

organized by the Center of Clinical Psychology. These trainings had an approximate duration of 2 hours. When this training ended, the participants in the ACT condition were asked to take a 10-minute break and to come back to the room to participate in the session. We emphasized that participation was voluntary.

Although the RNT-focused ACT intervention was designed to be web-based applied, the sessions of this study were conducted vis a vis to: (a) prevent access of participants of the WLC condition to the program (i.e., if web-based applied, we could not guarantee that participants of the WLC condition would not have followed the program, as all participants worked together in the same center and shared the computer room for most part of the working day), and (b) enhance adherence to the program by conducting the sessions in convenient space times (i.e., we took advantage of the fact that clinical psychology trainees were asked to refrain from programming clinical sessions during a period of 3 hours to attend to the mandatory trainings).

The sessions were conducted in groups of approximately 15 participants and were led by two psychologists who were previously trained in the application of the training by the second author. The psychologists only had a facilitator role because all sessions consisted of viewing videos, hearing audio files, and responding individually to some exercises. Interaction between the participants during the sessions was minimal.

All outcome and process measures were administered at pretreatment and posttreatment. The PTQ-CPT was also administered after finishing Module 2 (i.e., at the beginning of the fifth session) to analyze the potential longitudinal mediator role of the training effect. Participants in the RNT-focused ACT condition were considered completers if they attended at least 4 sessions (i.e., two thirds of the training). The posttreatment measures were administered one week after

finishing the training (approximately two months after the pretreatment measurement, i.e., first week of October 2018). The participants in the WLC condition began the training afterwards.

2.7. Data analysis

Prior to conducting the data analyses, all variables were explored for accuracy of data entry and missing values. Missing data points in the items of the scales were estimated using the participant's mean score for the specific scale. No missing data were found after conducting this estimation. Afterwards, we inspected raw data graphically and identified the outliers, which were replaced with the next highest value by following the Winsor method (Guttman, 1973). Less than 4% of the data were modified during outlier correction.

Data analyses were conducted with the free software JASP 0.9.1.0 (https://jasp-stats.org/) and with SPSS 25©. First, independent sample *t*-tests were conducted to explore the equivalence of both conditions at pretreatment. Secondly, repeated measures analysis of variance (RM ANOVA) were computed to analyze the effects of the factors Time (Pretreatment and Posttreatment) and Condition (RNT-focused ACT training vs. WLC) on all dependent variables. The effect size for pre-post designs suggested by Morris (2008) was computed on the online calculator http://www.psychometrica.de/effect_size.html#interpretation (Lenhard & Lenhard, 2016). This effect size is a variation of Cohen's *d* which controls for differences of the conditions at pretreatment and its results can be interpreted as small (*d* = .20 to .49), medium (d = .50 to .79), and large (above d = .80) (Cohen, 1988).

As the inclusion of psychologically healthy participants in this type of studies tends to dilute the intervention outcomes (e.g., Bunce, 1997), we reran the analyses with only the participants with high levels of emotional symptoms (percentile 65th in the current study in the DASS-Total score, which corresponded with a score higher than 20). Also, we computed the

reliable change index (RCI) and clinically significant change (CSC) according to the guidelines provided by Jacobson and Truax (1991) with the data presented for the DASS-Total. The RCI indicates whether a participant has shown a change score on a psychometric instrument that exceeds the reasonably expected change due to measurement error alone. CSC ocurrs when the participant shows an RCI and his/her score in the instrument that is closer to the nonclinical average than to the clinical average. Chi-squared tests were conducted to analyze possible statistically significant differences in the frequency of RCI and CSC between conditions. Cohen's *d*s were obtained from the chi-square value according to the formula presented by Rosenthal and DiMatteo (2001).

To analyze the potential longitudinal mediating role of RNT focused on the clinical practice (i.e., PTQ-CPT scores) in the training effects, six independent, simple mediation analyses were conducted with the nonparametric bootstrapping procedure to estimate direct and indirect effects using PROCESS 3.1 (Hayes, 2018). In all mediation analyses, condition (i.e., ACT vs. WLC) acted as the predictor variable. RNT focused on the clinical practice (i.e., PTQ-CPT scores) at the end of Module 2 (i.e., the beginning of the fifth session) was entered as the putative mediator. The outcome measures at posttreatment served as criterion variables (Y). Lastly, to control for pretreatment scores on the outcome variabes and the mediator variable, scores in the same type of outcome entered as Y were included as covariates as well as the scores on the mediator variable (i.e., PTQ-CPT scores). The total effect (*c*) of type of treatment (X) on outcome variables (Y) was modeled through two pathways: the direct pathway and the indirect one. The direct effect (*c'*) runs from the type of treatment to outcomes without passing through RNT focused on the clinical practice. The indirect pathway runs from the type of treatment to outcomes through RNT focused on the clinical practice at the end of Module 2 (*ab*). Mediation

analysis is mainly based on estimating the indirect pathway (*ab*) (Hayes & Rockwood, 2017). Indirect effects were deemed significant if the 95% bias corrected (BC) bootstrap confidence intervals (CI) for those effects based on 20,000 bootstrapped samples did not include zero. The partially standardized indirect effect (ab_{ps}) was computed as an indicator of the effect size of mediation. This effect size can be interpreted as the number of standard deviations by which the outcome is expected to change (increase or decrease) as result of the indirect process analyzed (Preacher & Kelley, 2011). In simple mediation models, ab_{ps} has shown satisfactory bias level (Miočević, O'Rourke, MacKinnon, & Brown, 2018).

3. Results

Figure 1 shows participants' flow throughout the study. All participants in the ACT condition attended at least 4 sessions and, thus, were considered as completers. No data were lost at posttreatment.

INSERT FIGURE 1 ABOUT HERE

3.1. Equivalence of conditions at pretreatment

Table 1 shows the mean scores of each condition at pretreatment. Overall, the scores of the ACT condition were slightly higher in emotional symptoms and RNT measures, but the independent sample *t*-test did not reveal statistically significant differences between conditions (DASS-Total: $t(83) = 1.258$, $p = .212$; Depression: $t(83) = 0.238$, $p = .813$; Anxiety: $t(83) = 1.360$, $p = .178$; Stress: $t(83) = 0.155$, $p = .877$; VQ-Progress: $t(83) = -0.086$, $p = .932$; VQ-Obstruction: $t(83) = 0.849$, $p = .398$; PTQ-CPT: $t(83) = 1.288$, $p = .201$; PTQ: $t(83) = 1.172$, $p = .245$).

INSERT TABLE 1 ABOUT HERE

3.2. Pre-post differences in the overall sample

Table 1 also shows that participants in the ACT condition showed a slight decrease in DASS-Total, Depression, and Anxiety scores, whereas the WLC showed increases in all these variables. Regarding the Stress scores, the ACT condition showed less increase of these symptoms at posttreatment than the WLC. The RM ANOVA showed statistically significant interaction effects between the factors Time and Condition for the DASS-Total, $F(1) = 10.35$, $p = .002$, and the DASS-Depression, $F(1) = 20.77$, $p < .001$, which indicates that participants in the WLC condition showed a higher increase of symptoms than participants in the ACT condition. However, there were no statistically significant interaction effects between Time and Condition for Anxiety, $F(1) = 2.76$, $p = .10$, or Stress, $F(1) = 1.79$, $p = .19$. The effect sizes were d_{corr} = 0.75, 0.79, 0.42, and 0.36 for DASS-Total, Depression, Anxiety, and Stress, respectively.

With respect to valued living, the ACT condition showed an increase of progress toward values (i.e., VQ-Progress scores) and a decrease in obstruction in valued living (VQ-Obstruction). The WLC condition showed the inverse pattern of pre-post change. The RM ANOVA showed a statistically significant interaction effect between the factors Time and Condition for VQ-Obstruction, $F(1) = 9.79$, $p = .002$. However, there was no statistically significant interaction effect between Time and Condition for VQ-Progress, $F(1) = 1.45$, $p = .231$. The effect sizes were d_{corr} = 0.34 and 0.51 for VQ-Progress and VQ-Obstruction, respectively.

Participants in the ACT condition showed decreases in RNT focused on the clinical practice (i.e., PTQ-CPT scores) and general RNT (i.e., PTQ scores), whereas participants in the WLC showed increases in these variables. We conducted paired t-tests with the ACT condition to analyze whether the changes in RNT measures were statistically significant. The results showed that participants in the ACT condition showed a decrease of scores in both the PTQ-

CPT, $t(42) = 3.76$, $p < .001$, and the PTQ, $t(42) = 2.93$, $p = .005$. The RM ANOVA showed statistically significant interaction effects between the factors Time and Condition for the PTQ-CPT, $F(1) = 11.60$, $p = .001$, and the PTQ, $F(1) = 7.01$, $p = .01$. The effect sizes were $d_{corr} = 0.89$ and 0.62 for PTQ-CPT and PTQ, respectively.

3.3. Pre-post differences in participants with high levels of emotional symptoms

Table 2 shows the mean scores of participants with high scores on the DASS-Total at pretreatment. The ACT condition showed a decrease of scores in all indicators of emotional symptoms, whereas the WLC condition showed increases. Regarding valued living, the ACT condition showed an increase in the VQ-Progress and a decrease in VQ-Obstruction, whereas the opposite pattern was observed for the WLC. Lastly, the ACT condition showed decreases both in RNT focused on the clinical practice and general RNT, whereas the WLC condition experienced increases in both indicators. The RM ANOVA revealed statistically significant interaction effects between Time and Condition for the DASS-Total, $F(1) = 14.99$, $p < .001$, $d_{corr} = 2.52$; DASS-Depression, $F(1) = 11.91$, $p = .002$, $d_{corr} = 1.21$; DASS-Anxiety, $F(1) = 5.60$, $p = .025$, $d_{corr} = 1.30$; VQ-Progress, $F(1) = 5.06$, $p = .033$, $d_{corr} = 1.10$;, and VQ-Obstruction, $F(1) = 6.12$, $p = .020$, $d_{corr} = 0.88$. The interaction effect for Time and Condition reached marginally significant levels of the PTQ, $F(1) = 4.14$, $p = .052$, $d_{corr} = 1.00$. We conducted paired t-tests with the ACT condition to analyze whether the changes in RNT measures were statistically significant. The results showed that participants in the ACT condition showed a statistically significant decrease of scores in the PTQ, $t(14) = 2.19$, $p = .046$, but not in the PTQ-CPT, $t(14) = 1.57$, $p = .14$.

INSERT TABLE 2 ABOUT HERE

Table 3 shows the percentages of RCI and CSC for each condition in participants with high levels of emotional symptoms. In the ACT condition, 11 of the 15 participants showed RCI (73.33%), and 10 participants (66.67%) showed CSC. These results contrasted with only 1 out of

the 14 participants (7.14%) showing RCI and CSC in the WLC condition. The chi-squared tests showed that a higher percentage of participants in the ACT condition obtained reliable changes and clinically significant changes: RCI ($\chi^2(1) = 13.08$, $p < .001$, $d = 1.81$) and CSC ($\chi^2(1) = 10.90$, $p < .001$, $d = 1.55$). Only 6.67% of the participants in the ACT condition showed deterioration of emotional symptoms at posttreatment, whereas 28.57% of participants in the WLC condition showed deterioration. This seems to indicate that the training did not show harm or unintended effects.

INSERT TABLE 3 ABOUT HERE

3.4. Mediation analyses

The mediation analyses conducted with emotional symptoms as dependent variables showed that RNT focused on the clinical practice (i.e., PTQ-CPT scores) at the end of Module 2 acted as mediator of the condition effect in all cases. Specifically, the indirect effects of condition on DASS-Total, DASS-Depression, DASS-Anxiety, and DASS-Stress were 3.787 (*SE* = 1.410, 95% BC CI [1.342, 6.806]), 0.882 (*SE* = 0.436, 95% BC CI [.181, 1.884]), 0.909 (*SE* = 0.462, 95% BC CI [.174, 1.960]), 1.424 (*SE* = 0.601, 95% BC CI [.329, 2.678]), respectively. The ab_{ps} for the same analyses were 0.289 (*SE* = 0.101, 95% CI [.108, .502]), 0.187 (*SE* = 0.090, 95% CI [.040, .388]), 0.909 (*SE* = 0.462, 95% BC CI [.174, 1.960]), and of 1.424 (*SE* = 0.601, 95% BC CI [.329, 2.678]).

The mediation analyses conducted with valued living scores as dependent variables showed that RNT focused on the clinical practice at the end of Module 2 acted as mediator of the condition effect only in VQ-Obstruction. With respect to scores on the VQ-Progress, the indirect effect of condition on VQ-Progress scores was not statistically significant, with an estimate of -0.522 (*SE* = 0.421, 95% BC CI [-1.523, .112]). The ab_{ps} for this analysis was -0.089 (*SE* = 0.073,

95% CI [-.264, .019]). Regarding the scores on the VQ-Obstruction, the indirect effect of condition on VQ-Obstruction scores was statistically significant (path *ab*), with an estimate of 1.399 (*SE* = 0.630, 95% BC CI [0.372, 2.835]). The ab_{ps} was 0.188 (*SE* = 0.085, 95% CI [.050, .380]).

4. Discussion

Mindfulness and acceptance-based trainings have been tested for fostering self-care and reducing stress in clinical psychology trainees. Specifically, Rudaz et al. (2017) found 9 studies that tested the effect of this type of interventions on clinical psychology trainees. Overall, the results were promising, but some mixed effects were found and most of the studies showed significant methodological limitations.

The current RCT aimed to analyze the effect of a 6-session, group-based, RNT-focused ACT training versus a waitlist control in emotional symptoms and valued living of clinical psychology trainees (*N* = 85). The training was an adaptation of the web-based RNT-focused ACT intervention for emotional disorders presented by Sierra and Ruiz (submitted), and its application required minimal training. The ACT training obtained statistically significant effects at posttreatment on overall emotional symptoms, depression, and obstruction in valued living, with medium to large effect sizes. Changes in process measures were also statistically significant, especially for RNT focused on the clinical practice, which showed a large effect size. Overall, the participants in the WLC condition showed increases of emotional symptoms throughout the study that were consistent with a previous study with trainees with similar characteristics (Ruiz, Dereix, et al., submitted).

The effect of the RNT-focused ACT training was greater with participants with high scores on emotional symptoms. Specifically, the intervention led to statistically significant and large effect sizes in overall emotional symptoms (*d* = 2.52), depression (*d* = 1.21), anxiety (*d* =

1.30), and values (d = 1.10 and 0.88 for the Progress and Obstruction subscales, respectively). There were statistically significant differences between conditions in the ratios of reliable change (ACT: 73.33%, WLC: 7.14%) and clinically significant change (ACT: 66.67%, WLC: 7.14%). It is worth noting that participants with high scores on emotional symptoms showed increases of emotional symptoms and decreases of valued living in the WLC condition, with 28.57% of them showing a deterioration of emotional symptoms throughout the study. This implies that the presence of emotional symptoms in trainees does not seem to be a transitory experience and that implementing RNT-focused ACT trainings might be especially beneficial for this type of trainees.

The mediation analyses conducted with the whole sample showed that the reduction of RNT focused on the clinical practice at the end of Module 2 was a statistically significant mediator of the intervention effect in reducing emotional symptoms and behaviors obstructing valued living. This is the first mediation analysis of RNT-focused ACT interventions and, as such, it provides preliminary evidence that this type of intervention works through its main hypothesized process of change. Further analysis should test whether this finding holds for RNT-focused ACT interventions implemented in clinical participants and explore other potential mediators such as measures of experiential avoidance, cognitive fusion or psychological flexibility.

Some strengths and limitations of the current study are worth mentioning. With respect to the strengths, the current study is one of the few RCTs conducted with clinical psychology trainees and mental health professionals (Rudaz et al., 2017). Specifically, the systematic review conducted by Rudaz et al. identified 9 studies that analyzed the effect of mindfulness and acceptance-based interventions for clinical psychology trainees. Only one of the studies was an

RCT (Smeets, Neff, Alberts, & Peters, 2014), two were nonrandomized trials (Shapiro, Brown, & Biegel, 2007; Stafford-Brown & Pakenham, 2012), and the remaining ones were open trials. Also, the current RCT is the most statistically powered (i.e., largest sample size) of the studies conducted with clinical psychology trainees. The latter factor is important, given that interventions with trainees might be more of a preventive nature, and effect sizes in this type of studies tend to be smaller than in clinical participants (e.g., Stice, Shaw, Bohon, Marti, & Rohde, 2009). Specifically, this study was well suited to identify medium effect sizes. An additional strength of the current study is the longitudinal mediation analysis conducted. To our knowledge, this is the first study with clinical psychology trainees that analyzes the longitudinal mediators of the intervention effects. Lastly, another strength of this study is that the implementation of the intervention required minimal training, which facilitates its diffusion. Additional studies might analyze the effect of the RNT-focused ACT training applied through website, which it is the original way of applying this intervention (Sierra & Ruiz, submitted).

Regarding the limitations of the study, firstly, the sample of this study consisted of undergraduate clinical psychology trainees. However, in a good number of countries, training in clinical psychology is only permitted at postgraduate level, which hinders the generalizability of the results of this study. Further studies might replicate the results of this study with clinical psychology trainees at postgraduate level. Secondly, the sample was recruited from only one university, which also affects the generalizability of the results. Thirdly, no follow-up data was collected; therefore, we have no evidence of the long-term effects of the RNT-focused ACT training. Collecting follow-up data in this study was not possible because of the lack of time: participants were in clinical training for only one additional month. This caused the need to apply the ACT training to the WLC condition immediately after obtaining the posttreatment data. Also,

raising conclusions from the collection of follow-up data only for the ACT condition at the end of the semester would be problematic because the number of stressors at the end of the semester is high and, in the absence of a control condition, the data would be difficult to interpret. Accordingly, further studies should analyze the long-term effect of the RNT-focused ACT training. Lastly, the training was compared to a WLC condition. Although WLC conditions are thought to control for hope and expectancies for change, they cannot control for the potentially beneficial effect of unspecific factors such as attention and support (Knock, Janis, & Wedig, 2008). Further studies might analyze the effect of the RNT-focused ACT training versus a nondirective supportive intervention.

In conclusion, this study adds empirical evidence of the efficacy of an easy-to-apply, RNT-focused ACT training in decreasing emotional symptoms and improving valued living through the putative process of change. Further studies might adapt the intervention more tightly to the stressors faced by trainees and analyze its effect in a web-based format.

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Table 1

Descriptive Data at Pretreatment and Posttreatment, Results of the Repeated Measures ANOVA, and Controlled *d* Effect Size

	RNT-focused ACT		Wait-list Condition		Between-group differences	
	Pre	Post	Pre	Post		
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*F*	Controlled *d*
Primary outcomes						
DASS-Total: Emotional symptoms	19.16 (11.72)	16.88 (10.56)	16.21 (9.78)	22.02 (15.00)	10.35**	0.75
DASS – Depression	4.91 (4.52)	3.02 (2.86)	4.67 (4.80)	6.45 (5.58)	20.77**	0.79
DASS – Anxiety	5.77 (3.86)	5.12 (4.08)	4.62 (3.93)	5.62 (5.82)	2.76	0.42
DASS – Stress	7.12 (3.91)	8.37 (4.89)	6.98 (4.40)	9.71 (5.38)	1.78	0.36
VQ: Valued living – Progress	20.19 (5.49)	20.60 (5.98)	20.29 (5.21)	18.90 (5.70)	1.64	0.34
VQ: Values living – Obstruction	10.49 (7.77)	10.12 (7.18)	9.14 (6.80)	12.50 (7.60)	9.99**	0.51
Process outcomes						
PTQ-CPT: RNT in clinical practice	15.44 (6.87)	11.42 (7.95)	13.50 (7.03)	15.67 (10.81)	11.60**	0.89
PTQ: General RNT	24.44 (13.10)	19.19 (11.68)	21.45 (10.21)	23.48 (14.91)	7.01**	0.62

Note. DASS = Depression, Anxiety, and Stress Scales-21; PTQ = Perseverative Thinking Questionnaire; PTQ-CPT = Perseverative Thinking Questionnaire – Clinical Psychology Trainees; VQ = Valuing Questionnaire.
*$p < .05$. **$p \leq .01$.

Table 2

Descriptive Data at Pretreatment and Posttreatment, Results of the Repeated Measures ANOVA, and Controlled *d* Effect Size for Participants with DASS-Total Scores Higher than 20 at Pretreatment

	RNT-focused ACT		Wait-list Condition		Between-group differences	
	Pre	Post	Pre	Post		
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*F*	Controlled *d*
Primary outcomes						
DASS-Total: Emotional symptoms	32.47 (7.75)	21.33 (10.42)	27.71 (4.63)	32.93 (13.46)	14.99**	2.52
DASS – Depression	9.53 (3.96)	4.73 (3.06)	9.14 (5.08)	9.86 (5.16)	11.91**	1.21
DASS – Anxiety	9.67 (3.13)	6.60 (3.89)	8.57 (3.05)	9.57 (6.38)	5.60*	1.30
DASS – Stress	11.00 (2.90)	9.60 (5.41)	11.57 (3.72)	13.43 (4.26)	2.75	0.97
VQ: Valued living – Progress	18.27 (3.94)	20.40 (5.93)	18.79 (4.10)	16.43 (4.93)	5.06*	1.10
VQ: Values living – Obstruction	16.60 (5.96)	13.80 (6.05)	13.93 (5.58)	16.36 (6.23)	6.12*	0.88
Process outcomes						
PTQ-CPT: RNT in clinical practice	18.13 (6.30)	15.33 (7.92)	18.00 (7.39)	20.36 (7.39)	2.85	0.75
PTQ: General RNT	33.27 (11.92)	25.27 (10.57)	28.00 (7.56)	30.14 (12.23)	4.14[a]	1.00

Note. [a]$p = .052$. DASS = Depression, Anxiety, and Stress Scales-21; PTQ = Perseverative Thinking Questionnaire; PTQ-CPT = Perseverative Thinking Questionnaire – Clinical Psychology Trainees; VQ = Valuing Questionnaire. *$p < .05$. **$p < .01$.

Table 3

Percentages of reliable change and clinically significant change in DASS-Total score in participants with DASS-Total > 20 at pretreatment

	Improved	No change	Deteriorated
Reliable Change			
ACT	73.33%	20.00%	6.67%
WLC	7.14%	64.29%	28.57%
Clinically Significant Change			
ACT	66.67%	26.67%	6.67%
WLC	7.14%	64.29%	28.57%

Note. ACT = Acceptance and commitment therapy; WLC = Waitlist control

Figure 1. Participants' flow throughout the study.