A MULTIPLE-BASELINE EVALUATION OF ACCEPTANCE AND COMMITMENT THERAPY FOCUSED ON REPETITIVE NEGATIVE THINKING IN PANIC DISORDER

UNA EVALUACIÓN DE LÍNEA BASE MÚLTIPLE DE LA TERAPIA DE ACEPTACIÓN Y COMPROMISO CENTRADA EN PENSAMIENTO NEGATIVO REPETITIVO EN TRASTORNO POR PÁNICO

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Abstract

Although cognitive-behavioral therapy (CBT) is efficacious for treating panic disorder, a segment of the population is not treated due to the treatment length and the acceptability of interoceptive exposure. This study explored the efficacy of a brief protocol based on acceptance and commitment therapy (ACT) focused on repetitive negative thinking (RNT) in adults suffering from panic disorder. We designed a 4-session RNT-focused ACT protocol because previous CBT studies considered this length "ultra-brief." Additionally, although conducting exposure is consistent with the ACT model, we did not include explicit exposure exercises to increase the intervention acceptability. A randomized, multiple-baseline design across three participants was implemented with a 3-month follow-up. The effect of the intervention was evaluated through weekly scores on the Depression Anxiety and Stress Scale – 21 (DASS-21; S. H. Lovibond & P. F. Lovibond, 1995), Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990), and the frequency of panic attacks. After the intervention, all participants ceased to experience panic attacks and showed clinically significant changes in the DASS-Total and PSWQ. The effect sizes comparable across designs were very large and statistically significant for the DASS-Total (d= 2.48), DASS-Depression (d= 1.45), DASS-Anxiety (d= 1.93), DASS-Stress (d= 1.63), and PSWQ (d= 2.36). All three participants also showed clinically significant changes and large effect sizes in experiential avoidance (d= 3.26), cognitive fusion (d= 3.58), and valued living (Progress: d= 0.72, Obstruction: d= 2.43). In conclusion, brief RNT-focused ACT interventions might be efficacious for treating panic disorder.

Keywords: *panic disorder, acceptance and commitment therapy, repetitive negative thinking, emotional symptoms, brief therapy*

Resumen

Aunque la terapia cognitivo-conductual (TCC) es eficaz en el trastorno de pánico, un segmento de la población no recibe tratamiento debido a su duración y aceptabilidad de la exposición interoceptiva. Este estudio exploró la eficacia de la terapia de aceptación y compromiso (ACT) focalizada en pensamiento negativo repetitivo (PNR) en adultos con trastorno por pánico. Se diseñó un protocolo de 4 sesiones porque estudios previos han considerado esta duración como "ultra breve". Pese a que la exposición es consistente con el modelo ACT, no incluimos ejercicios de exposición explícita para aumentar la aceptabilidad de la intervención. Se implementó un diseño de línea de base múltiple aleatorizado a través de tres participantes con un seguimiento de 3 meses. El efecto de la intervención se evaluó con la Depression Anxiety and Stress Scale - 21 (DASS-21, S. H. Lovibond y P. F. Lovibond, 1995), el Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990) y la frecuencia de ataques de pánico. Tras la intervención, los tres participantes dejaron de experimentar ataques de pánico y mostraron cambios clínicamente significativos en DASS-Total y PSWQ. Los tamaños del efecto comparables a través de diseños fueron muy grandes y estadísticamente significativos para DASS-Total (d = 2.48), DASS-Depresión (d = 1.45), DASS-Ansiedad (d = 1.93), DASS-Estrés (d = 1.63) y PSWQ (d = 2.36). Los participantes mostraron cambios clínicamente significativos y grandes tamaños del efecto en evitación experiencial (d = 3.26), fusión cognitiva (d = 3.58) y valores (Progreso: d = 0.72, Obstrucción: d = 2.43). En conclusión, las intervenciones breves ACT centradas en PNR podrían ser eficaces para tratar el trastorno por pánico.

Palabras clave: *trastorno por pánico, terapia de aceptación y compromiso, pensamiento negativo repetitivo, síntomas emocionales, terapia breve*

Suffering a panic attack is a relatively common experience among nonclinical and clinical populations (Moreno & Martín, 2007). For instance, de Jonge et al. (2016) found a cross-national lifetime prevalence of panic attacks of 13.2% in the general population. Most of these individuals (66.5%) experienced subsequent panic attacks over time, but only 12.8% experienced clinically relevant difficulties related to them.

After experiencing a panic attack, some individuals begin to suffer from frequent and unexpected new episodes and show constant worry about their new occurrence and consequences (e.g., "going mad," fear to die) that cause a deterioration of quality of life (Moreno & Martín, 2007). These individuals are usually diagnosed with a panic disorder, which has a cross-national lifetime prevalence estimate of 1.7%. A vast majority (80.4%) of the individuals who suffer from panic disorder also experience a lifetime comorbid psychological disorder (de Jonge et al., 2016). Common comorbid disorders are depression and other anxiety disorders, especially agoraphobia, social phobia, and generalized anxiety disorder (Kessler et al., 2005). Panic disorder tends to be a chronic condition and, in the absence of treatment, only a few individuals experience a complete remission (Craske & Barlow, 2014). In addition, the economic and interpersonal costs of panic disorder are elevated (Wittchen et al., 2010).

Cognitive-behavioral therapy (CBT) is widely regarded as the treatment of choice for panic disorder. CBT interventions for panic disorder usually consist of a package of techniques implemented in 12-15 sessions, including exposure, cognitive restructuring, relaxation training, and breathing retraining (Craske & Barlow, 2014). The weighted mean effect sizes of CBT interventions for panic disorders are large in panic (d = 1.015), anxiety (d = 0.840), and global adjustment (d = 0.895), whereas the effect size is medium for comorbid depressive symptoms (d = 0.645) (Sánchez-Meca et al., 2010). CBT seems to be more effective when participants have no comorbid disorders, and the problem has a shorter duration. The main active component of CBT interventions for panic disorder is exposure, which alone is associated with very large effect sizes (d = 1.528) (Sánchez-Meca et al., 2010).

Although the effect sizes of CBT interventions for panic disorder are large, the meta-analysis by Springer et al. (2018) indicates that the remission rate could be significantly improved. These authors adopted the following criteria for claiming panic disorder remission: (a) panic-free status, (b) scoring below a cutoff on a measure of anxiety/panic symptoms, and (c) good end-state functioning. CBT interventions yielded remission rates of 48.0% at posttreatment for intent-to-treat samples. Similarly, the meta-analysis conducted by Loerinc et al. (2015) found that only 53.2% of participants who received CBT for panic disorder met the criterion for claiming a responder status. These findings are not especially encouraging given the usual length of CBT interventions for panic disorder.

The limitations of CBT interventions for panic disorder are significantly amplified by the limited acceptability of exposure treatments in clients and their

underutilization and suboptimal implementation by mental health practitioners (e.g., Codd et al., 2011; Deacon et al., 2013b). For instance, Keijsers et al. (2001) found a dropout of about 20% in the CBT intervention for panic disorder. Furthermore, Deacon et al. (2013b) found that exposure therapists show concerns about the potential iatrogenic effects of prolonged and intense interoceptive exposure, as prescribed in CBT protocols. Also, therapists often believe that evoking anxiety is inherently unethical, increases dropout rates, and that exposure is insensitive to the clients' unique needs (Deacon et al., 2013a).

Given the abovementioned limitations in the CBT treatment of panic disorder, three complementary alternatives seem worth exploring: (a) introducing components that could increase the acceptability of exposure techniques for both clients and therapists, (b) developing and testing psychological interventions that do not include explicit exposure exercises and maintain the efficacy of exposure therapy, and (c) developing and testing brief interventions for panic disorder that could yield similar outcomes to CBT but in less than half of the therapeutic contact. The latter alternative would reduce the economic cost of psychological treatment, increase the availability of evidence-based interventions in mental health services, and might reduce the dropout rates. In the context of panic disorder, 5-session CBT protocols have been considered ultra-brief treatments. Preliminary evidence suggests that these ultra-brief protocols are as efficacious as CBT protocols of standard length (Otto et al., 2012).

Acceptance and commitment therapy (ACT; Hayes et al., 1999) is a contextual behavioral therapy that can provide an answer to the three alternatives commented above. The primary goal of ACT is to foster psychological flexibility in reaction to inner experiences, including thoughts, feelings, and bodily sensations. In so doing, ACT teaches clients to nonjudgmentally contact ongoing experiences while pivoting attention and effort to valued actions.

Regarding the first alternative, ACT is being increasingly tested as a precursor of exposure exercises in several anxiety disorders with the aim to organize and facilitate engagement in them (e.g., Meuret et al., 2012; Ramirez et al., 2021; Twohig et al., 2015). More specifically, in a preliminary study, Meuret et al. (2012) combined an introductory brief, 4-session ACT protocol with six subsequent sessions of exposure therapy. The intervention was associated with clinically significant changes and large effect sizes in panic symptom severity. Concerning the second alternative, initial studies exploring the effect of ACT on anxiety disorders purposefully excluded explicit exposure exercises, showing promising results (e.g., Codd et al., 2011; Twohig et al., 2006; 2010). Thus, it seems that ACT interventions do not need to include exposure to be effective. Lastly, brief versions of ACT are being developed and increasingly tested (Strosahl et al., 2012). Among these types of intervention, brief ACT protocols focused on dismantling counterproductive patter of repetitive negative thinking (RNT) are being increasingly tested in depression and anxiety disorders (Ruiz et al., 2016a; 2018a; 2019; 2020a; 2020b).

This study explores the second and third alternatives by developing and preliminarily testing a 4-session RNT-focused ACT protocol in three individuals with a primary diagnosis of panic disorder. We purposefully excluded explicit exposure exercises in the protocol. The intervention aimed to reduce (a) general RNT in the form of worry and rumination, (b) worry regarding the occurrence of panic attacks, and (c) hypervigilance to bodily sensations. The rationale of the intervention emphasizes the pernicious role of these processes and the dynamic relations among them. First, unconstructive RNT is elevated in individuals with panic disorder and tends to increase anxiety symptoms (Newman & Llera, 2011), which might trigger hypervigilance to bodily sensations and worry about the consequences of panic attacks that initiate the vicious circle of panic (Clark, 1986). Second, the constant worry about panic attacks (or apprehension) usually leads to the hypervigilance of bodily sensations and might increase general RNT because the individual's attention is focused on negative content. Lastly, hypervigilance of bodily sensations usually leads to catastrophic misinterpretations that trigger further worry about panic attacks and general RNT.

Method

Participants

The recruitment of participants was carried out through social media. Five participants met the following inclusion criteria: (a) being of legal age, (b) meeting the criteria for panic disorder as a primary diagnosis according to the Mini-International Neuropsychiatric Interview (MINI; Sheehan et al., 1998), (c) having experienced symptoms for at least the last three months, and (d) agreeing not to initiate additional therapy during the duration of the study. Exclusion criteria were: (a) experiencing a psychotic disorder, abuse of psychoactive substance abuse, or severe medical illness, and (b) requiring immediate treatment due to severe depression and suicidal behavior as assessed by the MINI.

Two of the 5 participants initially recruited showed a significant trend of improvement at baseline. As a result, these participants received the intervention, but their data were excluded from the study as it could not be determined whether the intervention caused the improvement (both ended the study with low scores on symptomatology). Table 1 presents the sociodemographic information, the main characteristics of the inflexible pattern of the final three participants, and their diagnoses according to the MINI. All three participants also met the criteria for the diagnosis of unipolar depression.

Table 1
Sociodemographic Data, Hierarchical Triggers of Worry/Rumination, Experiential Avoidance Strategies, and Diagnoses according to the MINI

	Gender	Age	Education Level	Profession	Hierarchical trigger for worry and rumination	Experiential avoidance strategies	Diagnoses according to the MINI
P1	F	24	Bachelor's	Photographer	Fear of loneliness	Worry, rumination, stopping eating, staying awake	Panic disorder Depression (recurrent)
P2	M	49	Bachelor's	Flight Attendant	Fear of failure	Worry, rumination, going out with friends, distraction, physical exercise, sleep	Panic disorder Depression
P3	M	30	Bachelor's	Master's student	Fear of failure	Worry, rumination, breathing exercises, writing down thoughts, searching for information on the internet, "ignoring" the thoughts	Panic disorder Depression

Design and Variables

A nonconcurrent, randomized, multiple-baseline design across participants was conducted. Participants were randomized to receive the intervention after 3-5 weeks of baseline. Randomization was performed through the tool https://www.randomizer.org. The independent variable consisted of a protocol of 4 weekly sessions of approximately 60 minutes. Table 2 presents the main characteristics of the protocol. The dependent variables were divided into outcome and process measures. The outcome measures were emotional symptoms (symptoms of depression, anxiety, and stress), frequency of panic attacks, and levels of pathological worry. The process variables were measures of experiential avoidance, cognitive fusion, and valued actions.

Table 2
Contents of the RNT-focused ACT Protocol

Session 1	➢ Introduction of the intervention rationale. ➢ Functional analysis of the psychological inflexibility pattern with a central focus on worry/rumination: identification of hierarchical triggers, main contents of the repetitive thought chain, additional experiential avoidance strategies. ➢ Identification and amplification of the consequences of the inflexible pattern and opening of a flexible alternative. Physical metaphor of pushing worry/ rumination triggers. ➢ Discrimination training on the process of worry/rumination and its contents, contact with its consequences, and training in distancing from the triggers. Physical metaphor of circling the chair. ➢ Audio 1. Exercise aimed at developing the skill to differentiate between engaging in RNT or taking distance from triggers while choosing to act in a valued direction.
Session 2	➢ Review of progress and difficulties experienced since Session 1. ➢ Training in multiple examples in distancing from worry/ rumination triggers: (a) Putting zoom to thoughts exercise, (b) Free association exercise, (c) Conscious fantasizing and worrying exercise, and (e) "I can't possibly..." exercise ➢ Audio 2. Exercise of observing thoughts in balloons from a hierarchical perspective.
Session 3	➢ Review of progress and difficulties experienced since Session 2. ➢ Observer exercise (modified to identify triggers of worry/rumination and contact with values). ➢ Clarification of values and identification of valued actions. Garden metaphor. ➢ Audio 3. Life movie exercise (contact with values and adversities).
Session 4	➢ Review of progress and difficulties experienced since Session 3. ➢ General review of the work done in the intervention. ➢ Exploration of the consequences of monitoring physical sensations as habitual behavior. Experiential exercise of monitoring vs. not monitoring. ➢ Identification of valued actions. ➢ Closing of the intervention.

Outcomes Measures

Depression, Anxiety, and Stress Scales-21 (DASS-21; S. H. Lovibond y P. F. Lovibond, 1995; Spanish version by Daza et al., 2002). The DASS-21 is a 21-item scale answered on a four-point Likert-type scale (3 = *it has happened to me a lot, or most of the time*; 0 = *it has not happened to me*). The instrument contains three subscales: Depression, Anxiety, and Stress. The sum of their scores provides an overall measure of emotional symptoms. The internal consistency of the Colombian validation is excellent, with a Cronbach's alpha of .93, and presents a hierarchical factor structure consisting of a general factor and three second-order factors (Ruiz et al., 2017).

Penn State Worry Questionnaire - 11 (PSWQ-11; Meyer et al., 1990; valida-

tion in Colombia by Ruiz et al., 2018b). The PSWQ-11 is an instrument containing 11 items answered on a Likert-type scale of five (5 = *very much*; 1 = *not at all*). The PSWQ-11 measures the severity of worry associated with generalized anxiety disorder. The PSWQ-11 has shown excellent internal consistency (Cronbach's alpha of .95) and a unifactorial structure. Scores above 38 can be considered high.

Self-report of panic attacks. A self-report was designed to measure the frequency of panic attacks and their associated physiological symptoms (palpitations, sweating, tremors, choking sensation, chest tightness, nausea, abdominal pain, tingling, numbness, chills, and fear of dying).

Process Measures

Acceptance and Action Questionnaire - II (AAQ-II; Bond et al., 2011; Spanish version by Ruiz et al., 2016b). The AAQ-II is an instrument that measures experiential avoidance and consists of 7 items that are answered on a 7-point Likert-type scale (7 = *always true*; 1 = *never true*). Higher scores on the AAQ-II indicate higher levels of experiential avoidance. The validation of the AAQ-II in Colombia showed excellent internal consistency (Cronbach's alpha .90) and a unifactorial structure. The average scores of participants without clinical problems are usually around 18 and 23 points, while the average scores of clinical participants are above 29 points.

Cognitive Fusion Questionnaire (CFQ; Gillanders et al., 2014; Spanish version by Ruiz et al., 2017). The CFQ is a scale that measures cognitive fusion through 7 items that are answered on a 7-point Likert-type scale (7 = *always true*; 1 = *never true*). Higher scores on the CFQ indicate higher cognitive fusion. The Colombian validation of the CFQ showed excellent internal consistency with a Cronbach's alpha of .93 and a unifactorial structure. The scores of nonclinical participants are usually between 20 and 24 points, while those of clinical participants are usually above 29 points.

Valuing Questionnaire (VQ; Smout et al., 2014; validation in Colombia by Ruiz et al., 2022). The VQ is a 10-item questionnaire that assesses general valued living during the previous week and is answered on a 7-point Likert-type scale (6 = *completely true*; 0 = *not at all*). The VQ has two subscales: Progress (enactment of values, including clear awareness of what is personally important and perseverance) and Obstruction (disruption of valued life due to avoidance of unwanted experiences and distraction from values). The Spanish version has shown good psychometric properties and a two-factor structure. The mean scores obtained for the general population in Colombia were 19.5 (SD = 6.43) for Progress and 11.7 (SD = 6.88) for Obstruction, while the mean scores for a clinical sample (N = 235) were 17.28 (SD= 6.98) and 15.25 (SD = 7.53), respectively.

Procedure

Phase 1. Design of the intervention protocol and researcher training

The intervention protocol was designed based on previous RNT-focused ACT protocols (Ruiz et al., 2016a; 2018a; 2019; 2020a; 2020b; Sierra and Ruiz, submitted). The first author was trained in applying the protocol over ten sessions, using role-playing, modeling, and feedback. Previously, the therapist had received theoretical and practical training in ACT equivalent to 128 hours with the last author during her master's studies. Additionally, the therapist received supervision during the implementation of the interventions by the second author and the last author.

Phase 2. Recruitment of Participants

In this phase, an advertisement explaining the research was distributed through social media. Those who showed interest in participating were interviewed to assess whether they met the inclusion and exclusion criteria of the study. This interview consisted of the application of the MINI and the questionnaires mentioned above. The participants who met the criteria signed the informed consent form in which they provided explicit approval to participate in the research. Participants who did not meet the inclusion criteria were given orientation and referral.

Baseline data were collected for each participant. Baselines ranged in duration from 3 to 5 weeks. Participants were randomly assigned to one of the baseline length options via www.randomizer.org. In addition, participants were trained in the completion of the self-report that was filled out upon presentation of a panic attack. The questionnaires mentioned above were applied weekly throughout the study.

Phase 3. Application of the Intervention Protocol

The intervention protocol was conducted weekly through 4 sessions of about 60 minutes.

Phase 4. Closure of the Research

Participants responded to the measures during the following month every week. Then, they responded to them every month until completing the 3-month follow-up. Once the follow-up was completed, each participant was summoned, and then the study was finished.

Data Analyses

Data were analyzed at the individual level and globally for the three participants. Individual analysis was performed through the nonparametric Tau-U test (Parker et al., 2011) and the calculator http://singlecaseresearch.org/calculators/tau-u. Tau-U is a non-overlap effect size between baseline and intervention data. As a nonparametric test, Tau-U does not require compliance with the parametric assumptions of normality, constant variance, and independence of measurements.

The Tau-U was derived from Kendall rank correlation and Mann Whitney U and can correct for significant trends during baseline. The range of Tau-U values is between -1 and 1 and can be interpreted as the percentage of data that improves through the baseline and intervention phase. For convenience, all effect sizes favorable to the positive intervention phase are presented in this study, regardless of whether the scores should decrease or increase.

After identifying the magnitude of change in each variable, the presence of clinically significant changes was identified following a proposal similar to the one presented by de Vries et al. (2016). Specifically, to indicate the presence of clinically significant changes, it was required: (a) the Tau-U value to be significantly greater than zero, and (b) to cross a cutoff point on the last treatment measure that placed the participant closer to the mean of the nonclinical than the clinical population. To test the latter criterion, we used data obtained across samples in test validation studies in Colombia (see also Ruiz et al., 2018b).

To obtain an overall appreciation of the treatment effect size, we calculated the effect size for multiple baseline designs developed by Pustejovsky et al. (2014) via the *scdhlm* package for R. This analysis provides a standardized mean difference that shares the same metric as Cohen's d effect size frequently used in group designs. Thus, this type of analysis yields an effect size that is comparable across different types of designs. This statistic requires a minimum of three cases for calculation and corrects for small sample bias using Hedges' g (Hedges et al., 2013). The *scdhlm* package can use two modeling modes: moment estimation and restricted maximum likelihood. This study used the first mode because some analyses showed convergence problems with the second mode, which is mathematically more complex.

Results

Outcome Measures

Figure 1 presents the evolution of participants' scores on outcome measures throughout the study. Visual analysis reveals relatively stable baselines trends across most participants and measures.

P1 experienced rapid changes in emotional symptoms and pathological worry, although there was an increase in some points during the follow-up period. Table 3 shows that effect sizes were close to 1 and statistically significant for all variables (DASS-Total = 0.92, $p = .005$; DASS-Depression = 0.92, $p = .005$; DASS-Anxiety = 0.82, $p = .012$; DASS-Stress = 0.94, $p = .004$; PSWQ-11 = 1.00, $p = .002$), showing clinically significant changes in all cases. Regarding the frequency of panic attacks, P1 reported experiencing three attacks during the four weeks of baseline and none after the introduction of the intervention.

P2 experienced more gradual changes after the introduction of the intervention. It should be noted that, due to work-related circumstances, Session 3 was conducted three weeks after Session 2. Table 3 shows that effect sizes were statistically sig-

nificant for all variables except for DASS-Anxiety (DASS-Total = 0.97, p = .014; DASS-Depression = 0.83, p = .035; DASS-Anxiety = 0.73, p = .060; DASS-Stress = 0.97, p = .014; PSWQ-11 = 1.00, p = .011). Changes were clinically significant for all variables in which Tau-U values had been statistically significant. Regarding the frequency of panic attacks, P2 reported experiencing two attacks during the two weeks of baseline and only two attacks after introducing the intervention, both in the week between Session 1 and 2.

P3 showed changes in all outcome variables that were maintained or increased during the follow-up period. Table 3 shows that effect sizes were statistically significant for all variables except for DASS-Depression (DASS-Total = 1.00, p = .005; DASS-Depression = 0.38, p = .290; DASS-Anxiety = 1.00, p = .005; DASS-Stress = 0.95, p = .007; PSWQ-11 = 1.00, p = .005). Changes were clinically significant for all variables where Tau-U values had been statistically significant. Finally, P5 reported two panic attacks during the three weeks of baseline and experienced no attacks after the introduction of the intervention.

Figure 1
Evolution of Scores in Emotional Symptoms and Pathological Worry

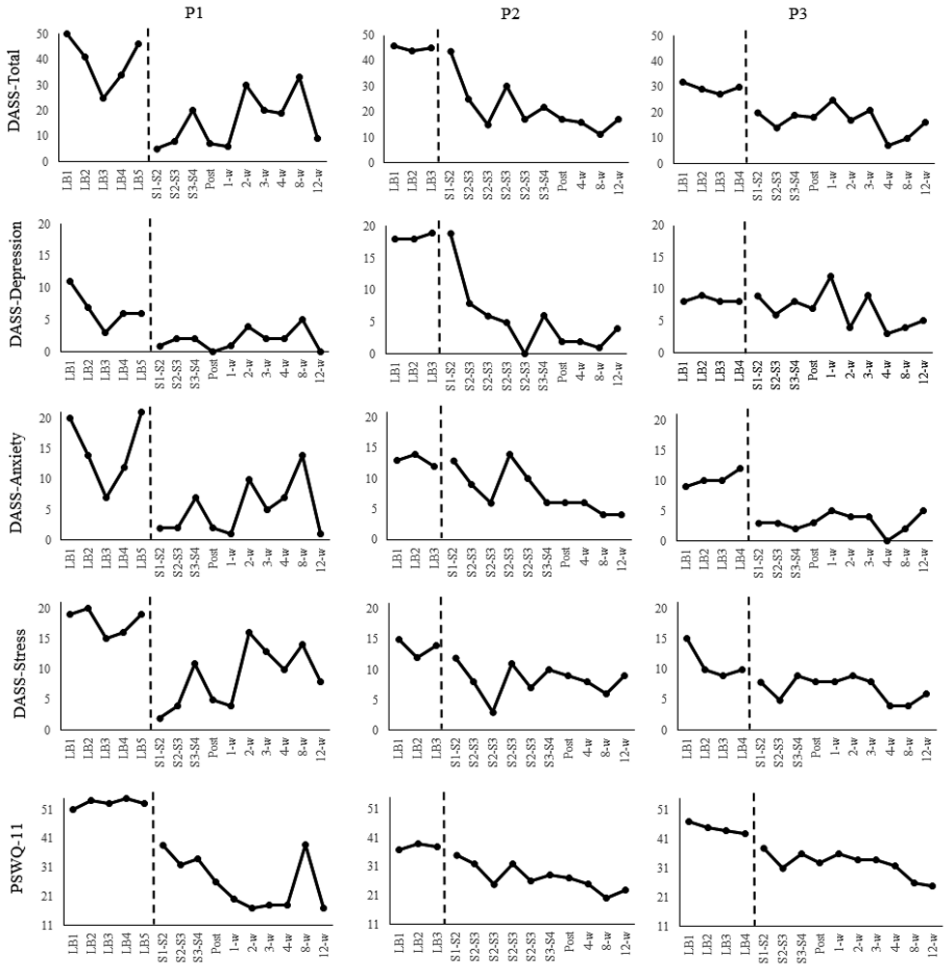


Table 3
Tau-U Results and Clinically Significant Changes

		P1	P2	P3
DASS – Total (Emotional symptoms)	*Tau-U*	0.92	0.97	1.00
	SE	0.33	0.39	0.35
	p	.005	.014	.005
	CSC	YES	YES	YES

		P1	P2	P3
DASS – Depression	*Tau-U*	0.92	0.83	0.38
	SE	0.33	0.39	0.35
	p	.005	.035	.29
	CSC	YES	YES	NO
DASS – Anxiety	*Tau-U*	0.82	0.73	1.00
	SE	0.33	0.39	0.35
	p	.012	.060	.005
	CSC	YES	NO	YES
DASS – Stress	*Tau-U*	0.94	0.97	0.95
	SE	0.33	0.39	0.35
	p	.004	.014	.007
	CSC	YES	YES	YES
PSWQ-11 (pathological worry)	*Tau-U*	1.00	1.00	1.00
	SE	0.33	0.39	0.35
	p	.002	.011	.005
	CSC	YES	YES	YES
AAQ-II (experiential avoidance)	*Tau-U*	1.00	0.90	1.00
	SE	0.33	0.39	0.35
	p	.002	.023	.005
	CSC	YES	YES	YES
CFQ (cognitive fusion)	*Tau-U*	1.00	0.80	0.95
	SE	0.33	0.39	0.35
	p	.002	.043	.007
	CSC	YES	YES	YES
VQ – Progress (value progress)	*Tau-U*	0.94	1.00	0.88
	SE	0.33	0.39	0.35
	p	.004	.011	.013
	CSC	YES	YES	NO
VQ – Obstruction (obstruction values)	*Tau-U*	0.96	0.93	0.88
	SE	0.33	0.39	0.35
	p	.003	.018	.013
	CSC	YES	YES	YES

Note. AAQ-II = Acceptance and Action Questionnaire – II, CSC = clinically significant change, CFQ = Cognitive Fusion Questionnaire, DASS = Depression, Anxiety and Stress Scale, PSWQ = Penn State Worry Questionnaire, SE = standard error, VQ = Valuing Questionnaire.

Process Measures

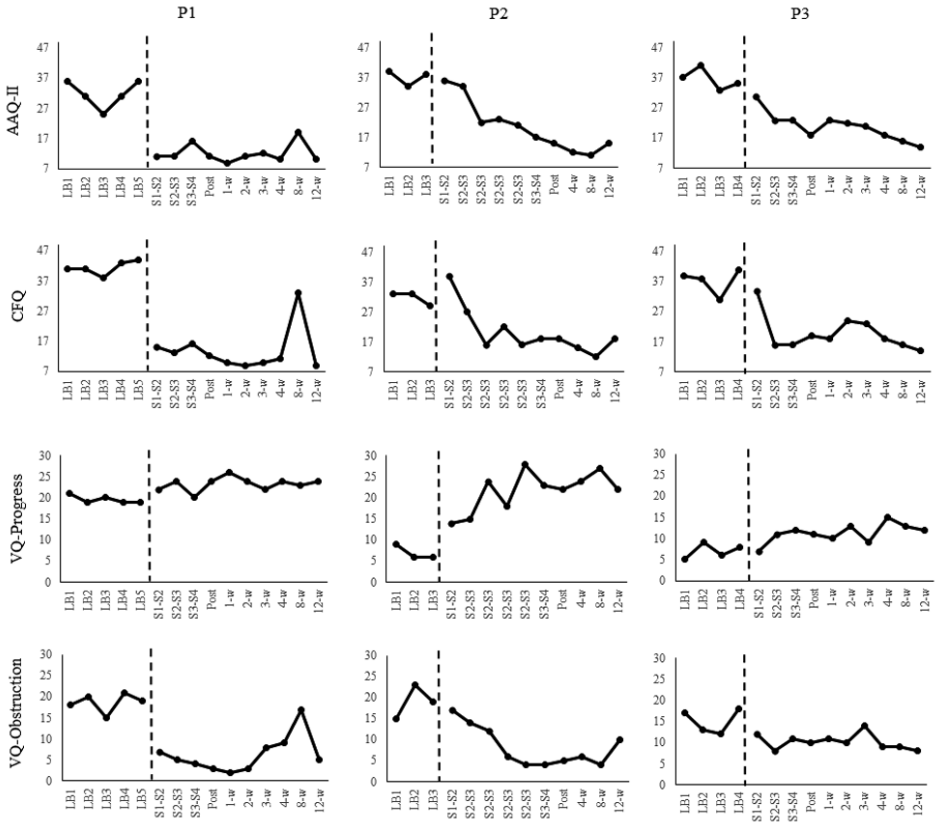
Figure 2 presents the evolution of participants' process measures scores throughout the study. Again, visual analysis reveals relatively stable baselines trends across most participants and measures.

P1 experienced large and immediate changes in experiential avoidance and cognitive fusion after introducing the intervention. These changes were maintained except at the one-week follow-up. The change in VQ-Obstruction was also immediate and large, although the change in VQ-Progress was moderate. Table 3 shows that the effect sizes were close to 1 and statistically significant for all variables (AAQ-II = 1.00, p = .002; CFQ = 1.00, p = .002; VQ-Progress = 0.94, p = .004; VQ-Obstruction = 0.96, p = .003), showing clinically significant changes in all cases.

P2 also improved in all variables, but the effect of the intervention was more gradual. The results remained stable during the follow-up period. Table 3 shows that effect sizes were statistically significant for all variables (AAQ-II = 0.90, p = .023; CFQ = 0.80, p = .043; VQ-Progress = 1.00, p = .011; VQ-Obstruction = 0.93, p = .018). Likewise, changes were clinically significant for all process variables.

Similar to P2, P3 showed stepwise changes in all process variables. According to Table 3, all effect sizes were statistically significant (AAQ-II = 1.00, p = .005; CFQ = 0.95, p = .007; VQ-Progress = 0.88, p = .013; VQ-Obstruction = 0.88, p = .013). Changes were clinically significant for all variables except VQ-Progress because the participant was closer to the clinical score than the nonclinical score at the last follow-up.

Figure 2
Evolution of Scores in Experiential Avoidance, Cognitive Fusion, and Values



Standardized Mean Difference

Table 4 presents the overall effect sizes obtained by the intervention. For the outcome measures, all effect sizes were large and significant (between $d = 1.45$ for DASS-Depression and $d = 2.48$ for DASS-Total). Similarly, the intervention obtained very large effect sizes for the process measures (between $d = 2.43$ for VQ-Obstruction and $d = 3.58$ for CFQ), except for the variable VQ-Progress ($d = 0.72$). All effect sizes were statistically significant.

Table 4
Difference of Comparable Standardized Means Across Designs

Measurement	BC-SMD	SE	CI 95% (lower)	CI 95% (upper)
DASS-Total	2.48	0.54	1.50	3.59
DASS-Depression	1.45	0.50	0.59	2.48
DASS-Anxiety	1.93	0.47	1.07	2.89
DASS-Stress	1.67	0.48	0.82	2.64
PSWQ-11	2.36	0.63	1.01	3.72
AAQ-II	3.26	0.82	1.85	4.97
CFQ	3.58	0.67	2.40	4.98
VQ-Progress	0.72	0.70	1.92	0.17
VQ-Obstruction	2.43	0.62	1.32	3.70

Note. AAQ-II = Acceptance and Action Questionnaire – II, CFQ = Cognitive Fusion Questionnaire, DASS = Depression, Anxiety and Stress Scale, PSWQ = Penn State Worry Questionnaire, SE = standard error, VQ = Valuing Questionnaire.

Discussion

The present study aimed to examine the efficacy of a brief RNT-focused ACT intervention in individuals with a primary diagnosis of panic disorder. For this purpose, a 4-session RNT-focused ACT protocol was designed based on previous protocols that had shown a high degree of efficacy in depression and generalized anxiety disorder (Ruiz et al., 2016a; 2018a; 2019; 2020a; 2020b). Although exposure is consistent with ACT, the protocol purposefully excluded explicit exposure exercises to explore an alternative to the limitations found for exposure in terms of acceptability for both clients and therapists (e.g., Deacon et al., 2013a; Keijsers et al., 2001). The effect of the intervention was evaluated in three participants in a randomized multiple-baseline design. Measures validated in the Colombian population were used for both outcome measures (emotional symptoms and pathological worry) and process measures (experiential avoidance, cognitive fusion, and values).

The intervention showed a high degree of efficacy in reducing emotional symptoms and pathological worry. All participants showed clinically significant changes in these variables except DASS-Depression (P3 showed no significant change) and DASS-Anxiety (P2). Also, the frequency of panic attacks was reduced to zero for P1 and P3, while P2 had only two attacks after the introduction of the intervention. These attacks occurred between Sessions 1 and 2. Therefore, it can be stated that after the intervention, panic attacks were completely suppressed in all three participants during the 3-month follow-up. Further evidence for the high efficacy of the intervention were the large effect sizes found in the reduction of emotional symptomatology ($d = 2.48$, 95% CI [1.50, 3.59]) and pathological worry ($d = 2.36$, 95% CI [1.01, 3.72]).

Results on process variables were also encouraging. All three participants

showed clinically significant changes in experiential avoidance, cognitive fusion, and values obstruction, while P1 and P2 also showed changes in values progress. The overall effect sizes were very large for experiential avoidance (d = 3.26), cognitive fusion (d = 3.58), and values obstruction (d = 2.43). The overall effect size for progress in values was close to large (d = 0.72). This difference between the effect size in progress and obstruction in values coincides with previous studies (Ruiz et al., 2016a; 2020a; 2020b) and could indicate that more extensive work would be needed to identify and engage in valued actions.

The present study replicates the promising findings found in previous studies obtained mainly on depression and generalized anxiety disorders (Ruiz et al., 2016a; 2018a; 2019; 2020a; 2020b). While previous studies had participants diagnosed with panic disorder, this is the first study to analyze the effect of a brief RNT-focused ACT protocol for treating panic disorder as a primary diagnosis.

As mentioned before, it is noteworthy that the protocol used in this study did not include explicit exposure exercises. Instead, the intervention focused on dismantling dysfunctional RNT patterns, increasing psychological flexibility, and reducing hypervigilance to physical sensations as a common form of RNT in people suffering from panic disorder. Thus, the intervention was effective despite not including an explicit exposure component. In this sense, the present research joins initial ACT studies that showed efficacy in anxiety disorders despite not having explicit exposure components in their protocols (Twohig et al., 2006, 2010).

The present study should be interpreted considering some limitations. First, the sample used was small, and further replications are necessary to confirm the efficacy of this brief, RNT-focused ACT intervention. In this regard, we initially recruited five participants, but two showed a marked trend of improvement during baseline, which made it impossible for us to take them into account for data analysis. Second, the effect of the intervention was only assessed through self-report measures. Future studies could analyze the effect of the intervention in a clinical interview and behavioral tests of tolerance to physiological sensations like those experienced during a panic attack (e.g., challenges of breathing CO2-enriched air). Third, a nonconcurrent multiple baseline design was conducted because the recruitment process was spread over several weeks. This type of design has lower internal validity than concurrent designs, although additional limitations should not be particularly problematic in this type of study (see discussion in Ruiz et al., 2018a). Future studies could compare the efficacy of the brief intervention tested in this study versus an empirically validated intervention for the treatment of panic disorder, such as cognitive behavioral therapy protocols that include interoceptive exposure. Finally, all three participants have a college education, which reduces the generalizability of the results found.

Despite the limitations listed above, this initial study shows that RNT-focused ACT interventions may constitute an alternative brief intervention model for panic disorder even without conducting explicit exposure. Furthermore, the non-inclusion

of exposure may result in greater acceptability of the intervention for clients and therapists who find it too threatening (Codd et al., 2011; Deacon et al., 2013a).

References

Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., Waltz, T., & Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and Action Questionnaire–II: A revised measure of psychological inflexibility and experiential avoidance. *Behavior Therapy, 42*(4), 676-688. https://doi.org/10.1016/j.beth.2011.03.007

Clark, D. M. (1986). A cognitive approach to panic. *Behavior Research and Therapy, 24*(4), 461−470. https://doi.org/10.1016/0005-7967(86)90011-2

Codd, R. T. III, Twohig, M. P., Crosby, J. M., & Enno, A. (2011). Treatment of three anxiety disorder cases with acceptance and commitment therapy in a private practice. *Journal of Cognitive Psychotherapy, 25*(3), 203–217. https://doi.org/10.1891/0889-8391.25.3.203

Craske, M. G., & Barlow, D. H. (2014). Panic disorder and agoraphobia. In D. H. Barlow (Ed.), *Clinical handbook of psychological disorders: A step-by-step treatment manual* (pp. 1–61). The Guilford Press.

Daza, P., Novy, D. M., Stanley, M. A., & Averill, P. (2002). The Depression Anxiety Stress Scale-21: Spanish translation and validation with a Hispanic sample. *Journal of Psychopathology and Behavioral Assessment, 24*, 195-205. https://doi.org/10.1023/A:1016014818163

de Jonge, P., Roest, A. M., Lim, C. C., Florescu, S. E., Bromet, E. J., Stein, D. J., Harris, M., Nakov, V., Caldas-de-Almeida, J. M., Levinson, D., Al-Hamzawi, A. O., Haro, J. M., Viana, M. C., Borges, G., O'Neill, S., de Girolamo, G., Demyttenaere, K., Gureje, O., ... Scott, K. M. (2016). Cross-national epidemiology of panic disorder and panic attacks in the world mental health surveys. *Depression and Anxiety, 33*(2), 1155-1177. https://doi.org/10.1002/da.22572

de Vries, R. M., Meijer, R. R., Van Bruggen, V., & Morey, R. D. (2016). Improving the analysis of routine outcome measurement data: What a Bayesian approach can do for you. *International Journal of Methods in Psychiatric Research, 25*(3), 155–167. https://doi.org/10.1002/mpr.1496

Deacon, B. J., Farrell, N. R., Kemp, J. J., Dixon, L. J., Sy, J. T., Zhang, A. R., & McGrath, P. B. (2013a). Assessing therapist reservations about exposure therapy for anxiety disorders: The therapist beliefs about Exposure Scale. *Journal of Anxiety Disorders, 27*(8), 772–780. https://doi.org/10.1016/j.janxdis.2013.04.006

Deacon, B. J., Lickel, J. J., Farrell, N. R., Kemp, J. J., & Hipol, L. J. (2013b). Therapist perceptions and delivery of interoceptive exposure for panic disorder. *Journal of Anxiety Disorders, 27*(2), 259–264. https://doi.org/10.1016/j.janxdis.2013.02.004

Gillanders, D. T., Bolderston, H., Bond, F. W., Dempster, M., Flaxman, P. E., Campbell, L., Kerr, S., Tansey, L., Noel, P., Ferenbach, C., Masley, S., Roach, L., Lloyd, J., May, L., Clarke, S., & Remington, B. (2014). The development and initial validation of the Cognitive Fusion Questionnaire. *Behavior Therapy, 45*(1), 83-101. https://doi.org/10.1016/j.beth.2013.09.001

Hayes, S. C, Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. Guilford Press.

Hedges, L. V., Pustejovsky, J. E., & Shadish, W. R. (2013). A standardized mean difference effect size for multiple baseline designs across individuals. *Research Synthesis Methods, 4*(4), 324–341. https://doi.org/10.1002/jrsm.1086

Keijsers, G. P., Kampman, M., & Hoogduin, C. A. (2001). Dropout prediction in cognitive behavior therapy for panic disorder. *Behavior Therapy, 32*(4), 739-749. https://doi.org/10.1016/S0005-7894(01)80018-6

Kessler, R. C., Chiu, W. T., Demler, O., & Walters, E. E. (2005). Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry, 62*(6), 617-627. https://doi.org/10.1001/archpsyc.62.6.617

Loerinc, A. G., Meuret, A. E., Twohig, M. P., Rosenfield, D., Bluett, E. J., & Craske, M. G. (2015). Response rates for CBT for anxiety disorders: Need for standardized criteria. *Clinical Psychology Review, 42*, 72-82. https://doi.org/10.1016/j.cpr.2015.08.004

Lovibond, P. F, & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy, 33*(3), 335–343. https://doi.org/10.1016/0005-7967(94)00075-U

Meuret, A. E., Twohig, M. P., Rosenfield, D., Hayes, S. C., & Craske, M. G. (2012). Brief acceptance and commitment therapy and exposure for panic disorder: A pilot study. *Cognitive and Behavioral Practice, 19*(4), 606–618. https://doi.org/10.1016/j.cbpra.2012.05.004

Meyer, T. J., Miller, M. L., Metzger, R. L., & Borkovec, T. D. (1990). Development and validation of the Penn State Worry Questionnaire. *Behaviour Research and Therapy, 28*, 487-495.

Moreno, P., & Martín, J. C. (2007). *Tratamiento psicológico del trastorno de pánico y la agorafobia* [*Psychological treatment of panic disorder and agoraphobia*]. Desclée.

Newman, M. G., & Llera, S. J. (2011). A novel theory of experiential avoidance in generalized anxiety disorder: A review and synthesis of research supporting a contrast avoidance model of worry. *Clinical Psychology Review, 31*(3), 371-382. https://doi.org/10.1016/j.cpr.2011.01.008

Otto, M. W., Tolin, D. F., Nations, K. R., Utschig, A. C., Rothbaum, B. O., Hofmann, S. G., & Smits, J. A. J. (2012). Five sessions and counting: Considering ultra-brief treatment for panic disorder. *Depression and Anxiety, 29*(6), 465–470. https://doi.org/10.1002/da.21910

Parker, R. I., Vannest, K. J., Davis, J. L., & Sauber, S. B. (2011). Combining nonoverlap and trend for single-case research: Tau-U. *Behavior Therapy, 42*(2), 284-299. https://doi.org/10.1016/j.beth.2010.08.006

Pustejovsky, J. E., Hedges, L. V., & Shadish, W. R. (2014). Design-comparable effect sizes in multiple baseline designs: A general modeling framework. *Journal of Educational and Behavioral Statistics, 39*(5), 368–393. https://doi.org/10.3102/1076998614547577

Ramirez, M. W., Woodworth, C. A., Evans, W. R., Grace, G. A., Schobitz, R. P., Villarreal, S. A., Howells, C. J., Gissendanner, R. D., Katko, N., Jones, K. N., McCabe, A. E., & Terrell, D. J. (2021). A trauma-focused intensive outpatient program integrating elements of exposure therapy with acceptance and commitment therapy: Program development and initial outcomes. *Journal of Contextual Behavioral Science, 21*, 66-72. https://doi.org/10.1016/j.jcbs.2021.06.002

Ruiz, F. J., Flórez, C. L., García-Martín, M. B., Monroy-Cifuentes, A., Barreto-Montero, K., García-Beltrán, D. M., Riaño-Hernández, D., Sierra, M. A., Suárez-Falcón, J. C., Cardona-Betancourt, V., & Gil-Luciano, B. (2018a). A multiple-baseline evaluation of a brief acceptance and commitment therapy protocol focused on repetitive negative thinking for moderate emotional disorders. *Journal of Contextual Behavioral Science, 9*, 1–14. https://doi.org/10.1016/j.jcbs.2018.04.004

Ruiz, F. J., García-Beltrán, D. M., Monroy-Cifuentes, A., & Suárez-Falcón, J. C. (2019). Single-case experimental design evaluation of RNT-focused acceptance and commitment therapy in GAD with couple-related worry. *International Journal of Psychology Therapy, 19*(3), 261–276.

Ruiz, F. J., García-Martín, M. B., Suárez-Falcón, J. C., & Odriozola-González, P. (2017). The hierarchical factor structure of the Spanish version of Depression Anxiety and Stress Scale -21. *International Journal of Psychology & Psychological Therapy, 17*, 97–105.

Ruiz, F. J., Luciano, C., Flórez, C. L., Suárez-Falcón, J. C., & Cardona-Betancourt, V. (2020a). A multiple-baseline evaluation of acceptance and commitment therapy focused on repetitive negative thinking for comorbid generalized anxiety disorder and depression. *Frontiers in Psychology, 11*, 356. https://doi.org/10.3389/fpsyg.2020.00356

Ruiz, F. J., Monroy-Cifuentes, A., & Suárez-Falcón, J. C. (2018b). Penn State Worry Questionnaire-11 validity in Colombia and factorial equivalence across gender and nonclinical and clinical samples. *Anales de Psicología, 34*(3), 451–457. https://doi.org/10.6018/analesps.34.3.300281

Ruiz, F. J., Peña-Vargas, A., Ramírez, E. S., Suárez-Falcón, J. C., García-Martín, M. B., García-Beltrán, D. M., Henao, Á. M., Monroy-Cifuentes, A., &Sánchez, P. D. (2020b). Efficacy of a two-session repetitive negative thinking-focused acceptance and commitment therapy (ACT) protocol for depression and generalized anxiety disorder: A randomized waitlist control trial. *Psychotherapy, 57*(3), 444-456. https://doi.org/10.1037/pst0000273

Ruiz, F. J., Riaño-Hernández, D., Suárez-Falcón, J. C., & Luciano, C. (2016a). Effect of a one-session ACT protocol in disrupting repetitive negative thinking: A randomized multiple-baseline design. *International Journal of Psychology & Psychological Therapy, 16*(3), 213–233.

Ruiz, F. J., Suárez-Falcón, J. C., Cárdenas-Sierra, S., Durán, Y., Guerrero, K., & Riaño-Hernández, D. (2016b). Psychometric properties of the Acceptance and Action Questionnaire–II in Colombia. *The Psychological Record, 66*, 429–437. https://doi.org/10.1007/s40732-016-0183-2

Ruiz, F. J., Suárez-Falcón, J. C., Riano-Hernández, D., & Gillanders, D. (2017). Psychometric properties of the Cognitive Fusion Questionnaire in Colombia. *Revista Latinoamericana de Psicología, 49*(1), 80-87. https://doi.org/10.1016/j.rlp.2016.09.006

Ruiz, F. J., Suárez-Falcón, J. C., Segura-Vargas, M. A., & Gil-Luciano, B. (2022). Psychometric properties of the Spanish version of the Valuing Questionnaire in Colombian clinical and nonclinical samples. *Journal of Clinical Psychology, 78*(2), 233–248. https://doi.org/10.1002/jclp.23212

Sánchez-Meca, J., Rosa-Alcázar, A. I., Marín-Martínez, F., & Gómez-Conesa, A. (2010). Psychological treatment of panic disorder with or without agoraphobia: a meta-analysis. *Clinical Psychology Review, 30*(1), 37-50. https://doi.org/10.1016/j.cpr.2009.08.011

Sheehan, D. V., Lecrubier, Y., Sheehan, K. H., Amorim, P., Janavs, J., Weiller, E., Hergueta, T., Baker, R., & Dunbar, G. C. (1998). The Mini-International Neuropsychiatric Interview (M.I.N.I): The development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *The Journal of Clinical Psychiatry, 59*(Suppl 20), 22–33.

Sierra, M. A., & Ruiz, F. J. (2022). Content validity and usability of a self-help online acceptance and commitment therapy program focused on repetitive negative thinking [Manuscript submitted for publication]. Facultad de Psicología, Fundación Universitaria Konrad Lorenz.

Smout, M., Davies, M., Burns, N., & Christie, A. (2014). Development of the Valuing Questionnaire (VQ). *Journal of Contextual Behavioral Science, 3*(3), 164-172. https://doi.org/10.1016/j.jcbs.2014.06.001

Springer, K. S., Levy, H. C., & Tolin, D. F. (2018). Remission in CBT for adult anxiety disorders: a meta-analysis. *Clinical Psychology Review, 61*, 1-8. https://doi.org/10.1016/j.cpr.2018.03.002

Strosahl, K. D., Robinson, P. J., & Gustavsson, T. (2012). *Brief interventions for radical change: Principles and practice of focused acceptance and commitment therapy*. New Harbinger Publications.

Twohig, M. P., Abramowitz, J. S., Bluett, E. J., Fabricant, L. E., Jacoby, R. J., Morrison, K. L., Reuman, L., & Smith, B. M. (2015). Exposure therapy for OCD from an acceptance and commitment therapy (ACT) framework. *Journal of Obsessive-Compulsive and Related Disorders, 6*, 167-173. https://doi.org/10.1016/j.jocrd.2014.12.007

Twohig, M. P., Hayes, S. C., & Masuda, A. (2006). Increasing willingness to experience obsessions: Acceptance and commitment therapy as a treatment for obsessive-compulsive disorder. *Behavior Therapy, 37*(1), 3-13. https://doi.org/10.1016/j.beth.2005.02.001

Twohig, M. P., Hayes, S. C., Plumb, J. C., Pruitt, L. D., Collins, A. B., Hazlett-Stevens, H., & Woidneck, M. R. (2010). A randomized clinical trial of acceptance and commitment therapy versus progressive relaxation training for obsessive-compulsive disorder. *Journal of Consulting and Clinical Psychology, 78*(5), 705–716. https://doi.org/10.1037/a0020508

Wittchen, H.-U., Gloster, A. T., Beesdo-Baum, K., Fava, G. A., & Craske, M. G. (2010). Agoraphobia: A review of the diagnostic classificatory position and criteria. *Depression and Anxiety, 27*(2), 113-133. https://doi.org/10.1002/da.20646