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Group metacognitive therapy for repetitive negative thinking in primary and non-primary generalized anxiety disorder: An effectiveness trial

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Abstract

Background: Generalized anxiety disorder (GAD) is a common and highly comorbid anxiety disorder characterized by repetitive negative thinking (RNT). Treatment trials tend to exclude individuals with non-primary GAD, despite this being a common presentation in real world clinics. RNT is also associated with multiple emotional disorders, suggesting that it should be targeted regardless of the primary disorder. This study evaluated the acceptability and effectiveness of brief group metacognitive therapy (MCT) for primary or non-primary GAD within a community clinic. **Methods:** Patients referred to a specialist community clinic attended six, two-hour weekly sessions plus a one-month follow-up (*N*=52). Measures of metacognitive beliefs, RNT, symptoms, positive and negative affect, and quality of life were completed at the first, last, and follow-up sessions. **Results:** Attrition was low and large intent-to-treat effects were observed on most outcomes, particularly for negative metacognitive beliefs and RNT. Treatment gains increased further to follow-up. Benchmarking comparisons demonstrated that outcomes compared favorably to longer disorder-specific protocols for primary GAD. **Limitations:** No control group or independent assessment of protocol adherence. **Conclusions:** Brief metacognitive therapy is an acceptable and powerful treatment for patients with primary or non-primary GAD.

Key Words: Metacognitive therapy, repetitive negative thinking, generalized anxiety disorder, worry, rumination, effectiveness

Introduction

Generalized anxiety disorder (GAD) is one of the most common and highly comorbid anxiety disorders (Kessler, Chiu, Demler, & Walters, 2005; McEvoy, Grove, & Slade, 2011). Comorbidity with major depressive disorder is particularly high, with estimates up to 67% (Judd et al., 1998). Despite comorbidity being the norm rather than the exception in clinical practice (Brown, Campbell, Lehman, Grisham, & Mancill, 2001), most trials of evidence-based treatments restrict clinical samples to individuals with a specific primary disorder. One potential obstacle to the dissemination of evidence-based treatments is the perception that real world samples are not reflected within treatment trials (Barlow, Levitt, & Bufka, 1999). Effectiveness research plays a critical role in demonstrating that efficacious treatments evaluated within research settings are transportable to settings with (a) highly complex and comorbid patients who are referred via clinical routes, (b) clinicians with diverse caseloads, and (c) where strict exclusion criteria are not applied and treatments are not closely monitored (Shadish, Matt, Navarro, & Phillips, 2000). Meta-analyses investigating the effectiveness of treatments under real world conditions have supported the proposition that efficacious protocols can be highly effective outside of research trials (Stewart & Chambless, 2009). However, recent evidence suggests that more real world effectiveness trials are needed before clinicians are likely to perceive efficacy trials as being useful for guiding their clinical interventions (Gyani, Shafran, Myles, & Rose, 2014). This study contributes to the effectiveness literature by evaluating a brief group intervention targeting repetitive negative thinking (RNT) in primary and non-primary GAD within a community mental health clinic.

RNT can be defined as cognitive perseveration on negative themes, with worry and rumination being the most commonly studied forms within the GAD and depression literatures, respectively. Worry has been defined as "a chain of thoughts and images, negatively affect-laden, and relatively uncontrollable" (Borkovec, Robinson, Pruzinsky, &

DePree, 1983), and rumination has been defined as "behavior and thoughts that focus one's attention on one's depressive symptoms and on the implications of the symptoms" (Nolen-Hoeksema, 1991, p. 569). Wells and Matthews' (1996) Self-Regulatory Executive Function (S-REF) model is a metacognitive account of emotional disorders, which suggests that positive beliefs about RNT (e.g., RNT is helpful) motivate an individual to engage more fully in RNT. Once RNT is commenced, negative beliefs about RNT (e.g., RNT is dangerous and uncontrollable) then lead to a range of counterproductive cognitive (e.g., suppression, threat monitoring) and behavioral (e.g., avoidance, alcohol use) changes which, in turn, lead to an escalation of RNT. This escalation of RNT strengthens negative beliefs about the uncontrollability and dangerousness of thoughts and, continuing the cycle, leads individuals to abandon functional attempts to reduce their engagement in RNT and instead to use more extreme and dysfunctional overcontrol strategies. Wells (2013) argues that negative beliefs about RNT have the "…most pervasive and powerful influences in psychological disorder…giving rise to a sense of acute danger, hopelessness, and inefficacy (p. 188-189)." Within the S-REF model, RNT, attentional bias toward threat, and problematic behaviours that exacerbate psychological distress are together referred to as the Cognitive Affective Syndrome (CAS). Whereas more traditional cognitive behavior therapy targets the content of negative automatic thoughts, MCT targets positive and negative metacognitive beliefs that maintain the CAS.

Four MCT treatment trials for primary GAD have demonstrated large reductions in metacognitive beliefs and RNT. Two preliminary studies demonstrated promising effects, but small samples (Ns = 10) raise questions about the generalizability of the findings (Wells et al., 2010; Wells & King, 2006). van der Heiden, Muris, and van der Molen (2012) conducted a randomized controlled trial (RCT, N = 126) for primary GAD and found that 14 sessions of individual MCT was superior to intolerance of uncertainty therapy (IUT) and a delayed

treatment control (DT). van der Heiden, Melchior, and de Stigter (2013) subsequently evaluated 14 sessions of group MCT for primary GAD ($N = 33$), but found higher dropout (27% vs. 11%) and poorer outcomes than van der Heiden et al.'s (2012) trial of individual MCT. The authors concluded that group MCT might be less effective and acceptable than individual MCT, possibly due to there being less time to challenge each individual's idiosyncratic metacognitive beliefs. It is notable that van der Heiden et al.'s (2013) groups were relatively large (10-14 patients/group), which represents a considerable efficiency over individual treatment. However, the large group sizes may have diluted treatment effects and contributed to the high attrition. The only other group MCT trial included just eight adults with obsessive compulsive disorder (Rees & van Koesveld, 2008), suggesting that more research is required to more fully evaluate the utility of group MCT.

An important question that remains to be answered is whether these treatment effects would generalize to clinical samples with primary or non-primary GAD. The S-REF model, from which MCT derives, is a transdiagnostic theory (Wells & Matthews, 1996). MCT should therefore effectively reduce RNT regardless of the specific content of negative thoughts or primary diagnosis. Indeed, theory and accumulating evidence causally implicate RNT in the maintenance of various emotional disorders (Harvey, Watkins, Mansell, & Shafran, 2004; McEvoy & Brans, 2013; Nolen-Hoeksema & Watkins, 2011), and there is evidence that MCT is effective for a range of primary emotional disorders in addition to GAD, such as depression (Dammen, Papageorgiou, and Wells, in press; Papageorgiou & Wells, in press; Wells et al., 2012), social anxiety disorder (McEvoy, Mahoney, Perini, & Kingsep, 2009), and obsessive compulsive disorder (Rees & van Koesveld, 2008). Interventions targeting RNT may therefore be effective regardless of whether GAD is primary or not. No previous study has evaluated group-based MCT in a sample with primary or non-primary GAD. Given that comorbidity is the norm in clinical practice (Brown et al.,

2001), and it may be impractical in many settings to run diagnosis-specific groups based on primary disorders, demonstrating that group MCT is effective in comorbid mixed-diagnosis populations is important for real world practice.

The aim of this study was to evaluate the acceptability and effectiveness of brief MCT targeting RNT for individuals with GAD, regardless of whether or not GAD was their primary disorder. This study met several criteria for an effectiveness trial, including clinically representative patients (various primary disorders, highly comorbid, severe, referred by health practitioners), therapists (broad caseload, various levels of experience), and services (naturalistic community mental health clinic, Stewart & Chambless, 2009). To optimize the feasibility of running group therapy within community clinics, the treatment protocol in this study was shorter than in previous group and individual MCT trials. The shorter duration was expected to minimize attrition rates and clinician time per patient, which are important considerations within public mental health services where resources are scarce.

The first hypothesis was that brief MCT would be acceptable to patients with primary or non-primary GAD in a community clinic, as evidenced by low attrition. The second hypothesis was that group MCT would be associated with significant reductions in positive and negative metacognitive beliefs, as well as diagnosis-specific (i.e., worry, rumination) and transdiagnostic measures of RNT. The frequency of specific negative automatic thoughts was also expected to reduce as a side effect of targeting metacognitive beliefs. The third hypothesis was that MCT would result in significant improvements in symptoms of anxiety, depression, general psychological distress, higher order psychological dimensions of positive and negative affect, and quality of life. The fourth hypothesis was that brief group MCT would compare favorably to previous treatment trials of primary GAD.

Method

2.1 Participants

Patients were referred by general practitioners, psychiatrists, or clinical psychologists to a specialist Australian community mental health clinic for psychological treatment of anxiety disorders and/or depression. A structured diagnostic interview (Mini International Diagnostic Interview, Lecrubier et al., 1997; Sheehan et al., 1998) was used to establish the presence of anxiety and/or depressive disorders. Primary diagnoses were those that patients nominated as most debilitating at the time of assessment. Patients were offered a place in the MCT group if they met criteria for GAD, with the exception of patients with primary social anxiety disorder (SAD) who were referred to a SAD-specific group. Patient flow is illustrated in Figure 1. Data were collected from 11 consecutive groups conducted between September 2010 and July 2013, with between 3 and 7 patients per group (Median = 5). Only patients providing informed written consent for their clinical data to be used for research purposes were included in the analyses.

Demographic information for patients attending at least one treatment session is summarized in Table 1. The duration of the current mental disorder episode exceeded a year for most of the sample (n = 39, 75%), with a median duration of three years. A significant minority of the sample had self-harmed, attempted suicide, or spent time as an inpatient at a psychiatric hospital. About two-thirds of patients were taking psychiatric medication ($N = 35$, 67%) for an extended period of time (median 1 year; interquartile range 6 months to 4 years) without responding adequately. During the trial, one patient increased the dosage of her medication and another patient switched to a new medication.

2.2 Outcome Measures

2.2.1 Repetitive Negative Thinking. Three measures of RNT were administered; the *Penn State Worry Questionnaire* (PSWQ), the *Ruminative Responses Scale* (RRS), and the

Repetitive Thinking Questionnaire (RTQ-10). The PSWQ (Meyers, Miller, Metzger, & Borkovec, 1990) is a 16-item trait measure of pathological worry often used as the primary symptom measure in GAD treatment studies, while the RRS assesses the tendency to ruminate when feeling sad, blue or depressed. We used the five item brooding (RRS-BRO) and reflection (RRS-REF) subscales (Treynor, Gonzalez, & Nolen-Hoeksema, 2003). The RTQ-10 (Mahoney, McEvoy, & Moulds, 2012; McEvoy, Mahoney, & Moulds, 2010) is a transdiagnostic measure of RNT that has a robust unidimensional structure, distinguishes between clinical and non-clinical populations, and correlates very highly ($r = .95$) with the full 27-item scale (McEvoy et al., 2010; McEvoy, Thibodeau, & Asmundson, 2014). RTQ-10 (henceforth the RTQ) total scores can fall between 10 and 50. Scores on the other RNT scales can range from 16 to 80 (PSWQ) and 5 to 20 (RRS-BRO and RRS-REF). In this study Cronbach's alphas were high for all RNT measures (αs=.73-.95).

2.2.2 Cognitions and Metacognitions. The frequency of depressive (14 items, CCL-DEP) and anxious (12 items, CCL-ANX) thoughts was assessed using the *Cognitions Checklist* (Beck, Brown, Steer, Eidelson, & Riskind, 1987). Total scores fall between 0 and 56 (CCL-DEP), or 0 to 48 (CCL-ANX). Metacognitions were assessed using the positive (MCQ-POS) and negative (MCQ-NEG) subscales from the *Metacognitions Questionnaire-30* (Wells & Cartwright-Hatton, 2004). The MCQ-POS is a measure of positive beliefs about worry, while the MCQ-NEG measures negative beliefs about the uncontrollability and dangerousness of worry. Both scales comprise 6 items, and scores can range between 6 and 30. In this study Cronbach's alphas were high for all CCL and MCQ subscales (αs=.73-.96).

2.2.3 Symptoms and Quality of Life. Psychiatric symptoms and wellbeing were assessed with widely used measures of psychological distress, affect, depression, anxiety, and quality of life. Psychological distress was measured using the Kessler Psychological Distress Scale-10 (K10, Kessler et al., 2002), and negative and positive affect using the Positive and

Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Both measures have been widely used in previous transdiagnostic treatment trials (e.g., Farchione et al., 2012; Newby et al., 2013). The K10 consists of 10 items that measure common depressive and anxiety symptoms. The PANAS features 10-item positive (PANAS-POS) and negative (PANAS-NEG) affect subscales. Total scores for the K10, PANAS-POS and PANAS-NEG range from 10 and 50. The Beck Depression Inventory (BDI-II; Beck, Steer, & Brown, 1996) and Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988) assessed depression and anxiety symptoms, respectively. Both comprise 21 items and total scores can range from 0 to 63. The Quality of Life Enjoyment and Satisfaction Questionnaire Short Form (Q-LES-Q-SF; Endicott, Nee, Harrison, & Blumenthal, 1993) contains 14 items used to compute a total score, which is converted to a percentage (0%-100%). Cronbach's alphas for all symptom and quality of life measures were high (αs=.85-.94).

2.3 Procedure

Patients referred for treatment were posted the questionnaire battery to complete and bring to their initial assessment, at which the MINI was completed by a Clinical Psychologist experienced in both the assessment and treatment of emotional disorders. In addition, all cases were presented at weekly clinic meetings where diagnoses and treatment plans were discussed. All measures were completed prior to the first session, and following session 6 (post-treatment) and session 7 (follow-up). This study was approved by the Health Service's Human Research Ethics Committee (Reference # QI 2014_04).

2.4 Treatment

The group MCT program (Anderson & Campbell, 2011, manual available from first author) aimed to challenge positive and negative metacognitive beliefs about RNT (Wells, 2009), increase attentional flexibility, and improve active coping skills across six two-hour sessions (Sessions 1-6) plus a one-month follow-up (Session 7). Treatment fidelity was

supported by the use of a treatment manual that included detailed therapist notes, worksheets, and client handouts. Senior therapists had completed masters and/or doctoral degrees in clinical psychology and received weekly peer supervision. All groups were co-facilitated by one (7 groups) or two senior therapists (1 group), or one senior therapist plus one trainee therapist completing a masters or doctorate in clinical psychology (3 groups). All senior therapists had extensive experience at facilitating group interventions, with most participating in previous treatment effectiveness studies.

Session 1 covered psychoeducation about the nature of worry and rumination (RNT) and maintaining factors including negative beliefs about RNT (dangerousness, uncontrollability), unhelpful behaviors aiming to stop RNT (e.g., situational avoidance, thought suppression, reassurance, information-seeking, use of alcohol and drugs), attentional biases (e.g., past-, future-, and self-focused attention vs. task-focused attention), and positive beliefs about RNT (beliefs about how RNT could be helpful). Homework included monitoring RNT and associated symptoms and strategies typically used to control RNT.

Session two began with a homework review, whereas the remaining sessions began with an attention training exercise (i.e., mindfulness) followed by a homework review, before discussing the new content and finally setting homework for the following week. Session 2 targeted uncontrollability metacognitions and attention training. The belief that RNT is uncontrollable was first challenged using evidence testing with the whole group and then by setting a RNT postponement experiment for homework with a scheduled daily worry time. Attention training was introduced to increase internally- and externally-focused attentional flexibility, and included mundane task focusing (i.e., sustaining attention on present moment activity) and mindfulness (e.g., watching thoughts drift by, mindfulness of the breath). The rationale for these exercises was that regular practice facilitates attentional awareness, detachment, and redirection to a present task focus. It is noteworthy that this approach to

attention training differs from Wells' (2009) attention training technique, which is designed to increase attentional flexibility *and* direct attention away from the self. Session 3 focused on identifying and challenging dangerousness metacognitions. Group evidence-testing was completed to challenge beliefs that RNT is harmful, and behavioral experiments were collaboratively set for homework to challenge each patient's idiosyncratic dangerousness metacognitions. For instance, RNT up and down experiments were planned during which patients were encouraged to test their negative metacognitions by, on alternate days, either fully engaging in RNT or postponing RNT whilst monitoring outcomes with respect to their predictions. Patients were also taught questions that could help them to determine the veracity of the information they gathered with respect to their negative beliefs about RNT (e.g., Was it written by a qualified professional? Does the author represent an established and reputable health organization? Is the author free of commercial interests? Does the article include multiple pieces of evidence to back up its claims?).

Session 4 focused on challenging positive metacognitions in the group, first by group evidence-testing and then by setting a RNT up and down experiment for homework. In Session 5 patients were encouraged to rely on 'postponement' strategies for managing repetitive negative thoughts, which is consistent with MCT. In addition, active coping (structured problem-solving) was introduced as a technique to be used in worry time for constructively managing solvable problems that require action. Whilst active coping is a departure from Wells' (2009) MCT it was used to discourage maladaptive behavioral responses that constitute part of the Cognitive Affective Syndrome (e.g., repetitive checking, avoidance). Session 6 involved a review of the key principles and development of self-management plans, including early warning signs for RNT, potential risky situations, strategies/techniques that could be used to prevent a setback, and coping statements that

could be used to interrupt RNT. The follow-up session involved a review of progress and self-management plans.

2.5 Data Analyses

The first hypothesis was evaluated by reporting attendance rates. The second and third hypotheses were evaluated by examining the magnitude of effect sizes. Standardized effect sizes (Cohen's d; Cumming 2012) were computed using the formula $d = (M_1 - M_2)/ SD_{pre}$, where M_1 and M_2 are means at two time points (such as pre- and post-treatment, or pre-treatment and follow-up) and SD_{pre} is the pre-treatment standard deviation. Desirable changes, such as a reduction in depression or an increase in quality of life, resulted in a positive d value. Reliable and clinically significant change indices were calculated for the PSWQ (Jacobson & Truax, 1991).

The fourth hypothesis was evaluated by benchmarking the PSWQ outcomes in the current study against those of RCTs that investigated the efficacy or effectiveness of psychological interventions for primary GAD. To ensure that the results were comparable to the RCTs, these analyses used the subset of patients with primary GAD (n = 40) rather than the whole sample (n = 52). Trials from a recent meta-analysis (Hanrahan, Field, Jones, & Davey, 2013) and literature searches were used as benchmarks if (a) patients were diagnosed with primary GAD, (b) the PSWQ was used as an outcome measure, (c) patients were treated with a face-to-face psychological intervention, (d) intent-to-treat analyses were reported, and (e) at least 20 patients received treatment.

All analyses were intent-to-treat (ITT) and were conducted using the statistical software R version 3.0.1 (R Core Team, 2013). Missing data were handled using multiple imputation (National Research Council Panel on Handling Missing Data in Clinical Trials, 2010). One hundred imputations were generated using the robust model based imputation algorithm (Templ, Kowarik, & Filzmoser, 2011) implemented in the R package VIM (Templ,

Alfons, Kowarik, & Prantner, 2013). Analyses performed on each imputed dataset were pooled using standard multiple imputation rules (van Buuren, 2012).

Results

3.1 Session Attendance

Most patients attended at least five treatment sessions ($N = 46$, 88%), and all except one attended at least four. The one month follow-up was attended by 37 patients (71%).

3.2 Mean Changes and Standardized Effect Sizes

Mean scores at pre-treatment, post-treatment and follow-up are reported in Tables 2 and 3. There were statistically significant improvements on all 14 measures between pre-and post-treatment (all ps < .001). Effect sizes (unstandardized and standardized) and confidence intervals are also reported in Tables 2 and 3. The standardized effect sizes are plotted in Figure 2. The dotted vertical lines correspond to what are typically regarded as small ($d = .2$), medium ($d = .5$) and large ($d = .8$) effects (Cumming, 2012). Effect sizes were extremely large on the measures of negative metacognitions, worry, and RNT. There were also medium to very large effects observed on the other measures. Effect sizes for most measures increased between post-treatment and follow up. The effect sizes for negative metacognitions, worry and RNT were very large at follow up, exceeding two standard deviations.

3.3 Clinical Significance

Using Jacobson and Truax's (1991) method, a reliable change index (RCI) of 7 plus a score of ≤ 59 were used to define recovery. If a patient's score on the PSWQ declined by at least 7 points they were classed as having *reliably improved*; if their score increased by 7 or more points they were regarded as having *reliably deteriorated*. If a patient's score improved by at least 7 points *and* they had a score on the PSWQ at post-treatment (or follow-up) of 59 or less, they were classed as having *recovered*. We used a cutoff of 59 as recently published community and clinical norms indicate that a score of 58 or 59 is the boundary that best

differentiates normal and pathological worry (van der Heiden, Muris, Bos, Molen, & Oostra, 2009). No patients fell below this clinical cutoff at pre-treatment. At post-treatment no patients had reliably deteriorated, 86% had reliably improved, CI [77%, 96%], $p < .001$, and 74% had recovered, CI [62%, 86%], $p < .001$. The percentages were the same at follow up. When a lower PSWQ cutoff of 53 was used, which has been applied in some recent studies, 85% and 90% achieved reliable improvement at post-treatment and follow-up, respectively, and 65% recovered at both post-treatment and follow-up. These proportions compared well to van der Heiden et al.'s (2012) and van der Heiden et al.'s (2013) individual and group MCT outcomes, who used the same criterion (60-77% reliably improved, 37%-63% recovered).

3.4 Benchmarking PSWQ scores against RCTs

PSWQ outcomes were benchmarked against eight RCTs for primary GAD (Figure 3). Comparison individual treatments (N = 14) involved 12 to 30 therapy/therapist hours per patient. There were two comparison group treatments. Van der Heiden et al.'s (2012) groups included 10-14 patients over 14, 90-minute sessions, resulting in an average of 1.91 therapy hours/patient and 3.82 therapist hours/patient (14 sessions x 1.5 hours = 21 hours, 3 groups = total of 63 therapy hours, a total sample of 33 = 63/33 = 1.91 hours per patient; 2 therapists/group = 3.82 therapist hours/patient). Using similar calculations, Dugas et al.'s (2003) groups included used an average of 5.6 therapy hours/patient and 11.2 therapist hours/patient. The group treatment in this study included a combination of single therapist and co-therapist groups, typically to allow unpaid trainees to participate as co-therapists to meet their learning objectives at no cost to the service. Including these trainees as co-therapists translates to 2.96 therapy hours/patient and 3.96 therapist hours/patient. Therefore, the treatment in this study required similar therapist hours per patient to van der Heiden et al.'s (2012) group treatment but substantially less than the other comparison treatments.

Figure 2 contains a plot of pre- to post-treatment mean change scores for each study. These have been converted into standard deviation units (d) by dividing each change score by 7.93, which was the pre-treatment pooled standard deviation across all studies. The circles are the effect sizes for the comparison treatments. The triangle is the pre- to post-treatment effect size in the current study, and the square is the change from pre-treatment to follow-up in the current study, which at 10 weeks was shorter than the period between pre- and post-treatment assessments in all of the RCTs. Effect sizes in the current study were numerically larger than those observed in most of the RCTs. A control group effect size was calculated by pooling the pre- and post-treatment means across all waitlist groups (5 groups, 95 patients) from the benchmarking studies. Mean PSWQ total scores increased by .025 points ($d = .03$) during the waitlist period (12-14 weeks), suggesting that scores were stable without treatment.

Discussion

The main aim of this study was to evaluate a brief, six-session (plus 1 month follow-up) MCT protocol in individuals with primary or non-primary GAD. It was hypothesized that group MCT would be acceptable to patients, and would be associated with significant reductions in positive and negative metacognitive beliefs, RNT, anxious and depressive thoughts, positive and negative affect, and improved quality of life. It was also expected that these outcomes would compare favorably to previous trials of MCT for primary GAD. These hypotheses were supported.

Most patients attended 5 or 6 sessions of the six-session program, suggesting that they found MCT an acceptable way of targeting their RNT. MCT was associated with significant reductions in both positive and negative metacognitive beliefs, although the reductions were considerably larger for negative (uncontrollability and dangerousness) than positive metacognitions. It is notable that at pre-treatment patients endorsed fewer positive metacognitive beliefs, resulting in a floor effect, compared to negative metacognitive beliefs.

This pattern is consistent with therapists' observations that many patients deny benefits of their RNT at pre-treatment, and only acknowledge positive metacognitions later in treatment. Once patients have thoroughly tested the uncontrollability and dangerousness beliefs in early sessions, and no longer believe that their RNT is uncontrollable, many acknowledge that they choose to continue worrying on some occasions due to a range of perceived benefits (e.g., helps to keep me prepared, might prevent bad things happening, it is part of my identity). Positive beliefs may therefore be more strongly endorsed at mid-treatment, compared to the initial assessment when patients are more focused on the distress caused by their RNT. The fact that negative beliefs are targeted earlier in the program may also explain the larger effect sizes compared to positive beliefs. Our clinical impression is that positive beliefs are more easily acknowledged, challenged, and modified after negative beliefs have already been addressed, and that modifying these beliefs is important for reducing vulnerability to relapse. However, we were unable to demonstrate this in the current study as metacognitive beliefs were not assessed at each treatment session.

Engagement in RNT significantly and substantially reduced during treatment, with very large effect sizes on the RTQ and PSWQ, and large effect sizes on the RRS-Brooding subscale. This finding suggests that MCT has a large impact on diagnosis-specific (i.e., worry and rumination) and transdiagnostic measures of RNT. Although the psychometric properties of the RTQ are now well established (Mahoney et al., 2012; McEvoy et al., 2010; McEvoy et al., 2014), this is the first treatment study to compare the sensitivity to change of the RTQ as a measure of transdiagnostic RNT to diagnosis-specific measures. Our findings suggest that it was equally sensitive to change as the PSWQ and more so than the RRS subscales. The magnitude of these changes is striking given that the treatment was relatively brief, delivered within a group format, and included patients with primary and non-primary GAD.

Interestingly, the frequency of specific depressive and anxious negative thoughts also reduced during treatment despite the fact that negative automatic thoughts were not directly addressed during the protocol. This finding suggests that the frequency of negative thoughts reduced as a side effect of targeting metacognitive beliefs and, as such, the content of specific negative thoughts may not need to be directly addressed. Once individuals are equipped to disengage from the *process* of RNT then the *content* of specific negative thoughts appears to naturally intrude less frequently.

Although most studies of MCT have used very small samples, two exceptions are van der Heiden et al. (2012, $N = 61$) and van der Heiden et al. (2013, $N = 33$), who evaluated individual and group MCT, respectively. These authors found that 14 sessions of MCT effectively reduced worry for patients with primary GAD. van der Heiden et al. (2013) found smaller effect sizes for their group treatment than for the same treatment offered individually by van der Heiden et al. (2012). Benchmarking comparisons found that the brief, 6-week MCT group program evaluated in this study was associated with substantially larger changes in worry than van der Heiden et al.'s (2013) group treatment, which required a similar number of therapist hours per patient. These superior group outcomes may be explained, at least in part, by the use of smaller groups (3-7/group vs. 10-14/group), which may enable more individualized therapist attention to idiosyncratic beliefs and obstacles to change.

The effect sizes from this study were slightly smaller than van der Heiden et al.'s (2012) individual treatment. It is notable that the final assessment in this study was completed 10-weeks after treatment commencement, rather than at 14 weeks in van der Heiden et al.'s (2012) study. If the trajectory of improvement between post-treatment and follow-up continued then effect sizes from this study would have been comparable to van der Heiden et al.'s (2012) individual treatment outcomes by week 14. Interestingly, the post-treatment

PSWQ standard deviation in this study (SD = 6.9) was less than half that reported by van der Heiden et al. (2012, SD = 15.8), suggesting a more consistent treatment effect in group MCT.

Ladouceur et al. (2000) evaluated a 16-week Intolerance of Uncertainty Therapy (IUT) protocol in a relatively small sample (N = 26) with primary GAD based on the Intolerance of Uncertainty Model. These researchers found a slightly larger effect size than ours at follow-up and, again, outcomes may be comparable 16-weeks after commencement of our brief MCT protocol. Importantly, four subsequent trials of IUT failed to replicate the magnitude of Ladouceur et al.'s (2000) effects and, although they still found IUT to be effective, the effect sizes were smaller than for the brief group MCT protocol evaluated in this study (Dugas et al., 2003; Dugas et al., 2010; Gosselin, 2006; van der Heiden et al., 2012). Newman et al.'s (2011) evaluation of an integrated, 14-session CBT and interpersonal plus emotional processing therapy also resulted in comparable effect sizes to our study.

Targeting transdiagnostic metacognitions, rather than the content of diagnosis-specific cognitions, means that this approach is amenable to including diagnostically diverse samples. The findings of this study suggest that including a subsample with non-primary GAD did not adversely affect change in the primary therapeutic targets, which is important because many community clinics may not receive enough referrals to run groups based on primary disorders. Transdiagnostic group treatments may be an effective, efficient, and pragmatic way of offering treatment to a broader array of individuals. The brevity of the MCT program evaluated in this study makes it easier for therapists to schedule, and may help to minimize attrition without compromising the magnitude of change, compared to longer programs.

This study has several limitations that need to be considered. Firstly, the absence of a control group means that we could not rule out the possibility that factors other than MCT contributed to outcomes (e.g., non-specifics of therapy, medication, time). However, these factors are unlikely to fully account for the outcomes due to the long duration of medication

use (median = 2 years), the chronicity of self-reported RNT, and the benchmarking comparisons demonstrating comparable or superior outcomes to active treatments in RCTs and superior outcomes to waitlist controls. Secondly, sessions were not recorded to evaluate protocol adherence and therapist competence, and diagnoses were not confirm by a second assessor. While these limitations suggest that some caution is required when interpreting these results, they are typical of real world clinical practice and the findings nonetheless contribute to the limited existing knowledge about the potential benefits of using MCT in clinical samples referred to community clinics. Future RCTs evaluating MCT, mechanisms of change, including longer term follow-ups, and with other primary emotional disorders would be valuable for ensuring that these findings are replicable, enduring, and generalizable to other samples and settings.

This study is the first to evaluate the effectiveness of group MCT for a sample with primary or non-primary GAD in a community mental health clinic. Group MCT had low attrition and was associated with significant and substantial improvements in RNT, metacognitions, higher-order dimensions of positive and negative affect, symptoms, and quality of life. The relatively brief MCT protocol evaluated in this study resulted in comparable changes to substantially longer group and individual treatments. Transdiagnostic MCT appears to be an acceptable, effective, efficient, and practical intervention for targeting RNT in emotional disorders.

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Table 1.

Demographic Characteristics

Demographic Variable	
Mean age (SD)	38.0 (14.3)
Female	60
Employed	63
Education	
University	52
Technical or Trade Certificate	23
High School or less	25
Relationship Status	
Married / Defacto	52
Single	40
Other	8
Number of Diagnoses	
1	37
2	44
3 or more	19
Primary Diagnosis	
Generalized Anxiety Disorder	77
Major Depressive Disorder	17
Other	6
Primary, Secondary or Tertiary Diagnosis	
Generalized Anxiety Disorder	100
Major Depressive Disorder	35
Social Phobia	21
Other	32
Other Clinical Features	
Taking Psychotropic Medication	67
Previous Psychiatric Hospitalization	25
Attempted Suicide or Self-Harmed	15

Note. Other than age, all other values are percentages.

Table 2.

Measures of Metacognition, Repetitive Negative Thinking, and Negative Automatic Thoughts

Measure and Timepoint	M	SD	Mean Change from Pre-treatment			Standardized Mean Change (*d*)		
			Est	95% CI		Est	95% CI	
Negative Metacognitions (MCQ-NEG)								
Pre	17.93	*3.65*						
Post	10.99	*3.94*	**6.94**	5.80	8.07	**1.90**	1.35	2.45
Follow Up	9.63	*4.23*	**8.30**	7.05	9.54	**2.27**	1.68	2.86
Positive Metacognitions (MCQ-POS)								
Pre	12.13	*4.63*						
Post	9.63	*3.83*	**2.50**	1.19	3.81	**.54**	.26	.82
Follow Up	8.39	*3.11*	**3.74**	2.51	4.97	**.81**	.53	1.08
Repetitive Thinking (RTQ)								
Pre	40.36	*7.01*						
Post	28.10	*8.31*	**12.26**	9.93	14.59	**1.75**	1.20	2.30
Follow Up	24.83	*8.26*	**15.53**	13.40	17.66	**2.22**	1.63	2.81
Worry (PSWQ)								
Pre	66.14	*8.07*						
Post	51.49	*9.00*	**14.65**	12.28	17.02	**1.82**	1.34	2.29
Follow Up	48.50	*9.25*	**17.64**	15.16	20.13	**2.19**	1.66	2.71
Brooding Rumination (RRS-B)								
Pre	13.06	*3.40*						
Post	10.27	*2.92*	**2.79**	1.98	3.60	**.82**	.53	1.11
Follow Up	9.44	*2.32*	**3.61**	2.73	4.49	**1.06**	.79	1.34
Reflective Rumination (RRS-R)								
Pre	11.25	*3.85*						
Post	9.34	*2.59*	**1.90**	0.98	2.83	**.49**	.25	0.74
Follow Up	9.63	*3.12*	**1.62**	0.63	2.61	**.42**	.16	0.68
Depressive Cognitions (CCL-D)								
Pre	23.47	*9.67*						
Post	15.78	*10.31*	**7.69**	5.39	9.99	**.80**	.48	1.11
Follow Up	11.64	*9.00*	**11.84**	9.59	14.08	**1.22**	.89	1.56
Anxious Cognitions (CCL-A)								
Pre	15.50	*8.94*						
Post	10.76	*8.58*	**4.74**	2.99	6.50	**.53**	.30	.76
Follow Up	8.91	*7.64*	**6.59**	4.72	8.45	**.74**	.50	.97

Note. Est = point estimate of the (standardized) mean change. 95% CI = 95 percent confidence interval.

Table 3.

Symptom Measures

Measure and Timepoint	M	SD	Mean Change from Pre-treatment			Standardized Mean Change (*d*)		
			Est	95% CI		*d*	95% CI	
Psychological Distress (K10)								
Pre	27.42	7.21						
Post	21.16	6.97	**6.26**	4.91	7.62	**.87**	.64	1.09
Follow Up	20.08	6.92	**7.34**	5.75	8.93	**1.02**	.75	1.28
Depression (BDI-II)								
Pre	23.04	11.50						
Post	13.10	9.68	**9.94**	7.42	12.45	**.86**	.58	1.15
Follow Up	11.73	8.63	**11.31**	8.62	14.00	**.98**	.69	1.28
Anxiety (BAI)								
Pre	17.52	11.42						
Post	10.90	7.00	**6.62**	4.28	8.96	**.58**	.40	.76
Follow Up	10.02	7.90	**7.49**	4.76	10.23	**.66**	.43	.88
Negative Affect (PANAS-NEG)								
Pre	28.49	7.22						
Post	20.58	6.99	**7.91**	6.00	9.82	**1.10**	.74	1.45
Follow Up	19.57	7.05	**8.93**	7.14	10.71	**1.24**	.86	1.61
Positive Affect (PANAS-POS)								
Pre	25.47	7.25						
Post	29.24	6.57	**3.77**	2.29	5.25	**.52**	.30	.74
Follow Up	30.27	7.80	**4.80**	2.86	6.74	**.66**	.39	.93
Quality of Life (QLESQ-SF)								
Pre	50.67	14.92						
Post	58.42	15.73	**7.75**	4.69	10.81	**.52**	.28	.76
Follow Up	61.41	17.14	**10.74**	6.86	14.62	**.72**	.42	1.02

Note. Est = point estimate of the (standardized) mean difference. 95% CI = 95 percent confidence interval.
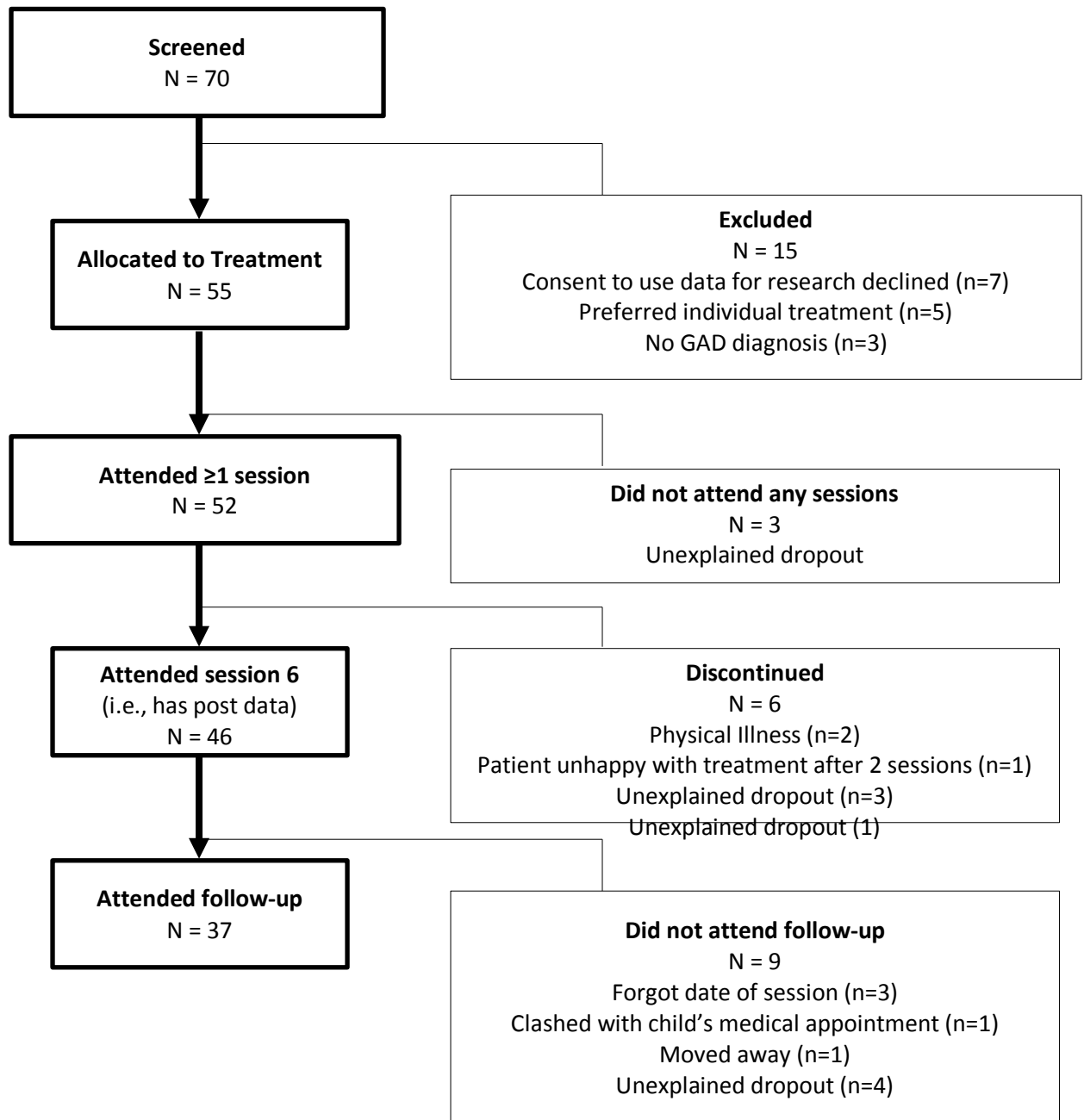
Figure 1. Patient flowchart.

Figure 2. Plot of pre-to-post treatment (circles) and pre-to-follow up (crosses) standardized effect sizes.
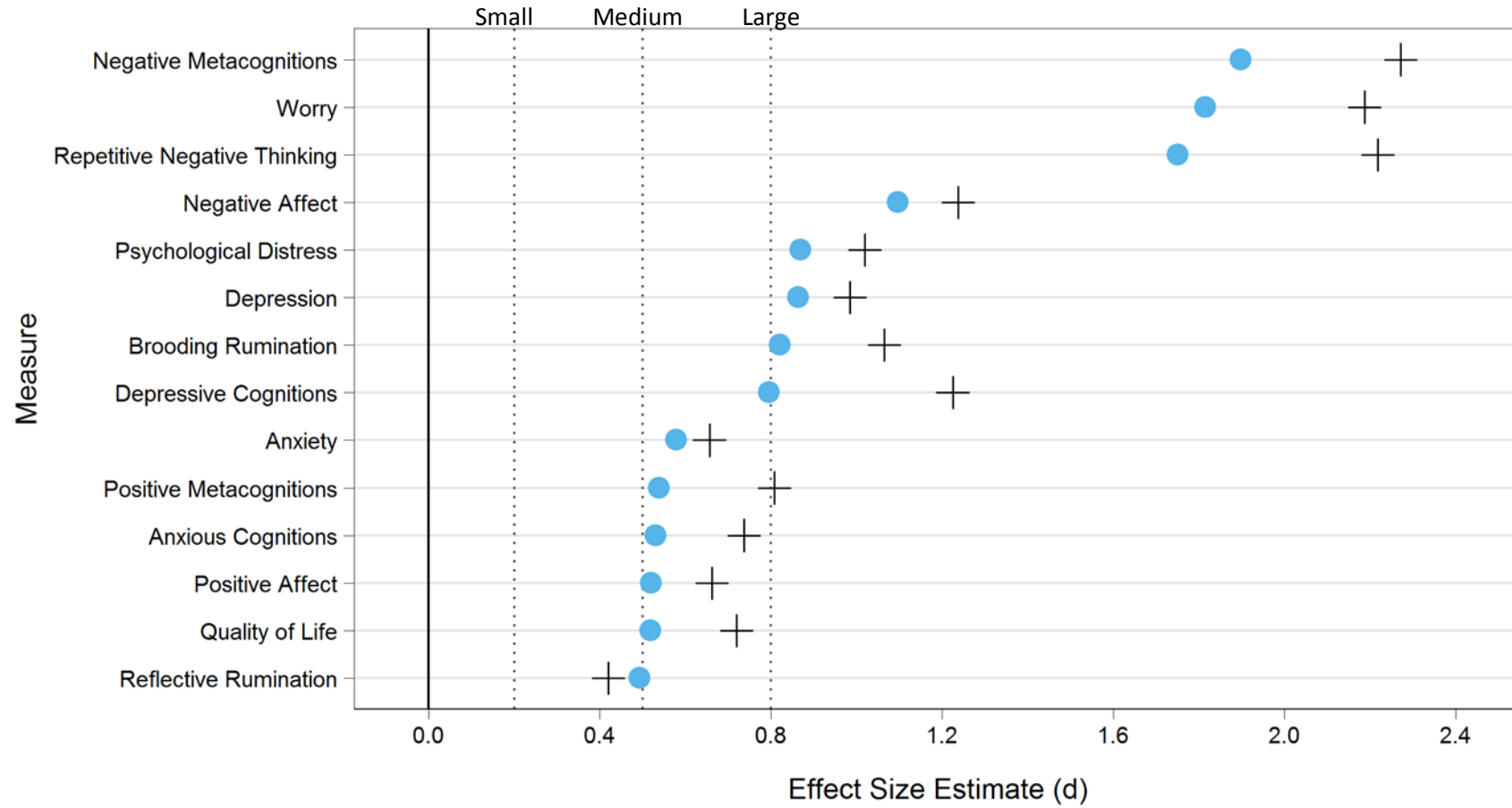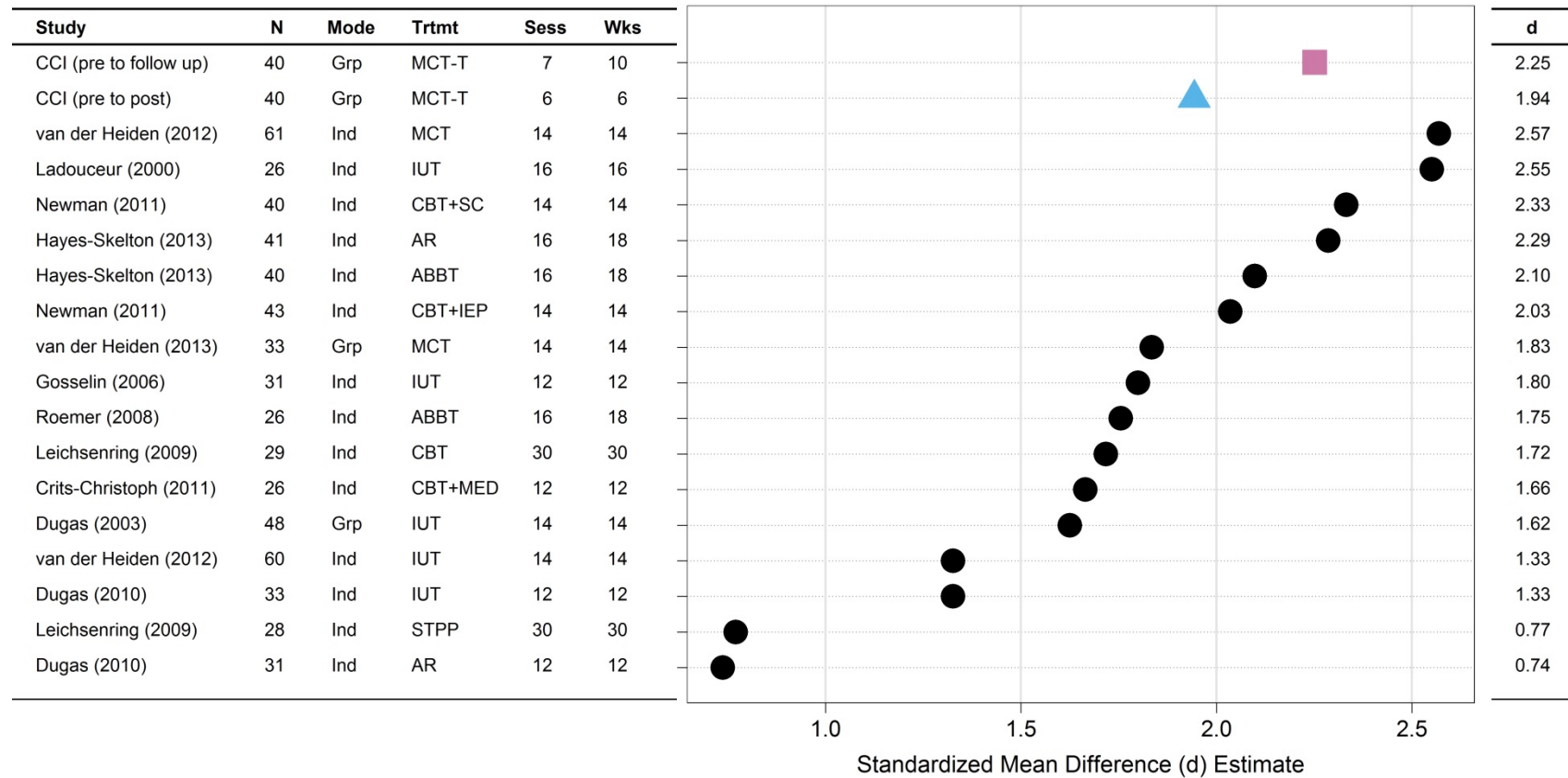
Figure 3. Benchmarking Plots of Penn State Worry Questionnaire Standardized Mean Differences

Study	N	Mode	Trtmt	Sess	Wks		d
CCI (pre to follow up)	40	Grp	MCT-T	7	10		2.25
CCI (pre to post)	40	Grp	MCT-T	6	6		1.94
van der Heiden (2012)	61	Ind	MCT	14	14		2.57
Ladouceur (2000)	26	Ind	IUT	16	16		2.55
Newman (2011)	40	Ind	CBT+SC	14	14		2.33
Hayes-Skelton (2013)	41	Ind	AR	16	18		2.29
Hayes-Skelton (2013)	40	Ind	ABBT	16	18		2.10
Newman (2011)	43	Ind	CBT+IEP	14	14		2.03
van der Heiden (2013)	33	Grp	MCT	14	14		1.83
Gosselin (2006)	31	Ind	IUT	12	12		1.80
Roemer (2008)	26	Ind	ABBT	16	18		1.75
Leichsenring (2009)	29	Ind	CBT	30	30		1.72
Crits-Christoph (2011)	26	Ind	CBT+MED	12	12		1.66
Dugas (2003)	48	Grp	IUT	14	14		1.62
van der Heiden (2012)	60	Ind	IUT	14	14		1.33
Dugas (2010)	33	Ind	IUT	12	12		1.33
Leichsenring (2009)	28	Ind	STPP	30	30		0.77
Dugas (2010)	31	Ind	AR	12	12		0.74

Note. Trtmt = Treatment type, Sess = Number of Sessions, Wks = Number of weeks between pre and post-treatment assessments, d = Standardized Mean Change Score, Grp = Group treatment, Ind = Individual treatment, AR = Applied Relaxation, CBT = Cognitive Behavior Therapy based on Borkovec's avoidance model, CBT+SC = CBT plus Supportive Counseling, CBT+IEP = CBT plus Integrated techniques from Emotion-focused and Interpersonal therapies, CBT+MED = CBT plus antidepressant medication, IUT = CBT based on an Intolerance of Uncertainty model, ABBT = Acceptance-Based Behaviour Therapy (ABBT), MCT = Metacognitive Therapy for GAD, MCT-T = Transdiagnostic Metacognitive Therapy.