Group Metacognitive Therapy for Generalized Anxiety Disorder: A pilot feasibility Trial

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Conflict of interest statement

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest

Author contribution statement

SH, SS, and PF were responsible for designing the study. SH and GBS conducted the therapy. PF supervised the therapists. EB and SS wrote the first draft of the manuscript and conducted statistical analyses. EB and TG were responsible for diagnostic interviews. SS acted as principle investigator and was responsible for getting ethical approval. All authors have contributed in revising the manuscript and approved its submission.

Keywords

Metacognitive Therapy, generalized anxiety disorder, GAD, Outcome, metacognition, Group Therapy

Abstract

Word count: 338

Background: Individual metacognitive therapy (MCT) for generalized anxiety disorder (GAD) is well established, but only one study has investigated the effectiveness of Group MCT (g-MCT) for GAD. The aim of the current study was therefore to evaluate the feasibility and effectiveness of g-MCT for GAD within a community mental health setting whilst addressing limitations evident in the previous study.

Method: The study used an open trial design, and 23 consecutively referred adults with GAD completed 10 sessions (90 minutes) of g-MCT, delivered by two therapists trained in MCT. Diagnoses were assessed by trained raters using the Anxiety Disorder Interview Schedule-IV. All patients but one had previous psychosocial treatment, and 17 (73.9%) had at least one comorbid axis-I disorder. Self-reported symptoms were assessed using the Penn State Worry Questionnaire, the Generalized Anxiety Disorder-7, and the Patient Health Questionnaire-9 at pre- and post-treatment as well as 3-month follow-up. Feasibility was assessed using rates of patients who declined group treatment in favour of individual treatment, patients not able to attend due to pre-scheduled dates for sessions, and drop-out rate.

Results: Of 32 eligible participants, six patients (19%) declined g-MCT in favour of individual MCT, and three (9%) were unable to attend due to scheduling conflicts. No patients dropped out during treatment, but two patients did not complete the self-report questionnaires at 3-month follow-up. g-MCT was associated with significant reductions in worry, anxiety, depression, metacognitive beliefs, and maladaptive coping. According to the standardised Jacobson criteria for recovery, 65.2% were recovered at post-treatment, whereas 30.4% were improved and 4.3% showed no change. At 3-month follow-up, the recovery rate increased to 78.3%. Moreover, recovery rates were comparable for patients with- and without comorbidity. Number of therapist hours per patient was 6.5 and the treatment has now been implemented as a standard treatment option at the clinic.

Conclusion: g-MCT for GAD is an acceptable treatment which may offer a cost-effective alternative approach to individual MCT. Recovery rates and effect sizes suggested that g-MCT could be just as efficient as individual MCT and cognitive behavioural therapy.

Ethics statements

(Authors are required to state the ethical considerations of their study in the manuscript, including for cases where the study was exempt from ethical approval procedures)

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All subjects gave written informed consent in accordance with the Declaration of Helsinki. The study was approved by the Regional Ethics Committee in Norway (REK; 2013/2155) and conducted without external funding.

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16 Running head: g-MCT for GAD
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Introduction

Generalized anxiety disorder (GAD) is a common disorder associated with a chronic course and significantly reduced quality of life (APA, 2013; Spitzer et al., 2006). It is characterized by excessive and uncontrollable worry related to multiple events or activities, with a duration of six months or more (APA, 2013). Associated symptoms include restlessness, fatigue, difficulties concentrating, irritability, muscle tension, and sleep difficulties (APA, 2013).

Cognitive behavioural therapy (CBT) is currently an evidence-based treatment for GAD (Hoyer et al., 2011). Meta-analyses show that CBT leads to a reduction in anxiety symptoms more so than treatment as usual or a waiting list (Covin et al., 2008; Hunot et al., 2007; Mitte, 2005). However, based on the criteria for clinically significant change (Jacobson & Truax, 1991), only 50-60% of patients with GAD recover at 6-month follow-up after CBT (Fisher & Durham, 1999). Thus, since a considerable proportion of GAD patients do not recover following CBT, more effective interventions are required.

Metacognitive Therapy (MCT) for GAD is an alternative treatment to CBT. MCT focuses on changing thought processes rather than thought content (e.g., Wells, 1995). MCT is derived from the self-regulatory executive function (S-REF) model (Wells & Matthews, 1994; 1996). Maintenance of psychological problems is linked to the activation of the cognitive-attentional syndrome (CAS) consisting of repetitive thinking (worry and rumination), threat monitoring, and maladaptive coping behaviours. The CAS is a product of an individual's metacognitive beliefs and knowledge. Central to the metacognitive model of GAD (Wells, 1995; 1997; 2009) is that individuals' thoughts and beliefs about worry (i.e. metacognitive beliefs) contribute to the development and maintenance of the disorder. Worry is often triggered by negative intrusive thoughts in the form of "what if" questions, e.g. "What if I'm involved in an accident?". Thereafter, the use of worry is related to the activation of positive metacognitive beliefs about the advantages or benefits of worrying (Wells, 2009). Examples of such positive beliefs are "Worrying makes me prepared, and focusing on threat keep me safe".

Symptoms of GAD escalate when negative metacognitive beliefs about worry are activated. Two types of negative beliefs are important: negative beliefs about the uncontrollability of worry (e.g. "I have lost control over my thoughts") and negative beliefs about the possible dangers of worry ("If I do not stop worrying, I will lose my mind"). The activation of negative metacognitive beliefs leads to worry about worry (also called "meta-worry" or "Type 2-worry"), which intensifies worry, anxiety, and other maladaptive coping strategies. The model proposes that individuals with GAD tend to use worry as a coping strategy to safeguard against perceived threats and dangers. Examples of other frequently used coping responses among GAD patients are thought suppression, threat monitoring, distraction, avoidance, and reassurance seeking. These coping strategies backfire and consolidate the belief that worry is uncontrollable.

The metacognitive model of GAD (Wells, 1995; 1997; 2009) proposes that both positive and negative metacognitive beliefs need to be modified to enable people to disengage from worrying in response to trigger thoughts. Furthermore, the model specifies that counterproductive coping strategies need to be modified if people are to successfully reduce worry.

So far, four studies have evaluated MCT for GAD delivered individually for outpatients. Wells and King (2006) conducted an open trial ($N = 10$), where a range of 3-12 weekly MCT sessions were delivered. There were significant improvements in symptoms of worry, anxiety,

131 and depression at post-treatment (within-group d's between 1.12 [health worry] and 2.78
132 [trait-anxiety]) and follow-up (within-group d's between 1.10 and 2.58), and 87.5% of the
133 patients met criteria for recovery on trait-anxiety (STAI-T) at post-treatment, and 75% were
134 recovered at 6- and 12-month follow-up.

135

136 The second study was conducted by Wells et al. (2010) and was a randomized controlled trial
137 ($N = 20$, 10 in each condition) where MCT was compared with applied relaxation (AR) in
138 patients with GAD. Treatment sessions lasted 45-60 minutes and were held once per week for
139 8-12 weeks. MCT was significantly more effective in reducing GAD symptoms than AR.
140 Following criteria (Fisher & Durham, 1999) for clinically significant change (PSWQ; cut-off
141 ≤ 47, reliable change index: 7), the recovery rate was 80% in the MCT group at post-
142 treatment, compared with 10% in the AR group. At 6-month follow-up, the recovery rate was
143 70% in the MCT group and 10% in the AR group, while the figure was 80% and 10%,
144 respectively, at 12-month follow-up. High recovery rates combined with a large within-group
145 effect size ($d = 3.41$) indicated that MCT was an effective treatment for GAD.

146

147 Van der Heiden et al. (2012) investigated the effectiveness of MCT and intolerance of
148 uncertainty therapy (IUT). Each treatment consisted of a maximum of 14 weekly sessions of
149 45 minutes. Both MCT and IUT were associated with significant reductions in symptoms of
150 GAD at post-treatment and 6-month follow-up, but MCT was found to be significantly
151 superior to IUT. The within-group effect sizes for worry (PSWQ) in the MCT group were
152 high at both post-treatment ($d = 1.67$) and follow-up ($d = 1.66$), and the between-group effect
153 sizes were 0.96 at post-treatment and 0.78 at follow-up. In the MCT intention-to-treat group,
154 60% met criteria for recovery on PSWQ (cut-off ≤ 53, reliable change index: 7) at end of
155 treatment and 62% at follow-up. The corresponding recovery rates for the IUT group were
156 37% and 47%, respectively.

157

158 Nordahl et al. (2018) compared the efficacy of MCT and CBT for GAD. Both CBT and MCT
159 produced significant reductions in worry (PSWQ) in comparison to the wait list group.
160 However, MCT was found to be more effective than CBT. In the MCT condition 65% were
161 classified as recovered post-treatment in comparison to 38% in the CBT condition, and the
162 difference was maintained at 2-year follow-up.

163

164 In summary, previous research indicates that individual outpatient MCT for GAD is well
165 established. According to, the National Institute for Health and Clinical Excellence (NICE,
166 2011) guidelines, MCT is a recommended treatment for GAD. However, group MCT (g-
167 MCT) for GAD has only been examined in one open trial (Van der Heiden et al., 2013). This
168 study used large groups (10-14 patients) which may limit participation of some group
169 members and not allow therapy to be implemented with sufficient specificity to address
170 individual needs. In addition, two out of the four therapists had not received training in MCT
171 thereby potentially limiting treatment adherence and competency. The sample consisted of 33
172 outpatients, treatment sessions lasted 90 minutes and were held weekly for 12-14 weeks.
173 There were significant reductions in worry, anxiety, and negative metacognitive beliefs. In the
174 intention-to-treat sample, the between group effect sizes at post-treatment and six-month
175 follow-up were 1.24 and 1.29 respectively. In terms of recovery, 55% of participants met
176 criteria for clinically significant criteria at post-treatment recovery rate at post-treatment (cut-
177 off: ≤ 53, reliable change index: 7).

178

179

180 Treatment in a group can be an attractive alternative to individual treatment for several
181 reasons. A similar effect as individual treatment will result in group treatment being more
182 cost-effective by cutting down on long waiting lists leading to more effective use of the
183 therapists' time. One assumption is that MCT will be well-suited to a group format because it
184 is based on a transdiagnostic model. A recent study supported the use of g-MCT for a
185 transdiagnostic sample (Capobianco, Reeves, Morrison, & Wells, 2018). The study found that
186 g-MCT was more effective than Mindfulness Based Stress Reduction in treating symptoms of
187 anxiety and depression. Furthermore, patients with GAD may worry about different events,
188 activities, life events and will frequently have different comorbid disorders, but MCT focuses
189 on changing the attitudes and beliefs one has around thought processes (i.e. worrying and
190 rumination) and is less concerned with the actual idiosyncratic thought content of each
191 patient. Patients can help each other identify shared maladaptive metacognitive beliefs and
192 coping strategies whilst their worry content differ.
193
194 Despite the appealing aspect of group treatment, a comparison of effect sizes, recovery-, and
195 attrition rates with previous studies of individual MCT indicates that g-MCT may be less
196 effective. Furthermore, the dropout rate was higher in g-MCT (27%) than in individual
197 treatment studies (van der Heiden et al., 2012: 18%; Wells et al., 2010 and Wells & King,
198 2006: 0%). In addition to the limitations of the Van der Heiden et al. (2013) study, the authors
199 also suggested several possible reasons for the differences from individual MCT. First, the
200 large group size (10-14 patients per group) may have reduced the acceptability of the
201 treatment modality and contributed to the high drop-out rate. Second, there may have been
202 less time to identify and challenge each patient's idiosyncratic metacognitive beliefs, given the
203 group size. Third, therapist factors may have comprised the effectiveness of the intervention
204 as only two out of four therapists were trained in MCT, and there was no supervision in
205 delivering g-MCT.
206
207 In summary, even though van der Heiden et al.'s (2013) results indicated that g-MCT was
208 effective in reducing GAD symptoms, many questions remain regarding the feasibility of g-
209 MCT, such as recruitment, group size, and retention. Consequently, the primary aim of the
210 current study was to benchmark and evaluate the feasibility of g-MCT for adult patients with
211 GAD. Moreover, to explore whether smaller groups would be more feasible and effective, as
212 only 4-6 patients were included in each group. The study was conducted at a Norwegian
213 psychiatric outpatient clinic without a control group. The secondary aim of the study was to
214 evaluate the effectiveness of g-MCT, with the hypothesis being that g-MCT will be associated
215 with significant reductions in symptoms of GAD and depression, as well as reductions in
216 positive- and negative metacognitions, maladaptive coping strategies, and avoidance.
217
218
219 **Methods**
220
221 *Participants*
222 The sample consisted of 23 participants, of which 22 were women (95.7%). The average age
223 was 29.70 years (SD = 9.21). Further demographic characteristics are shown in Table 1. The
224 four patients using antidepressants reported to use either Zoloft or Cipralex. Three of these
225 four had been on a stable dose for years, while the fourth started medication four months
226 before treatment. No changes were made to medication during treatment. In addition, two
227 patients used medicine for sleep related problems.
228
229   **Table 1 here**

230
231   Diagnosis was established using the Anxiety Disorder Interview Schedule (ADIS-IV, Brown
232   et al., 1994). To be included in the present study, GAD had to be the primary diagnosis. None
233   of the participants had known serious somatic illnesses, psychosis, post-traumatic stress
234   disorder, known cluster A- or B personality disorders, were suicidal, or suffered from drug
235   addiction. Seventeen (73.9%) participants had comorbid disorders. Fourteen had one
236   comorbid disorder (OCD = 4, depression = 2, panic disorder = 3, social anxiety disorder = 1,
237   specific phobia = 1, health anxiety = 1, ADHD = 2). Three patients had two comorbid
238   diagnoses (one with panic disorder and depression, one with OCD and depression, and one
239   with OCD and social phobia).
240

241   **Procedure**
242   The clinic has a population catchment of approximately 130,000 people. Patients were
243   referred to the clinical service from their GP, student health services, and mental health
244   clinics. The first group started in September 2016 and the last group started in October 2017.
245   Patients included in the study were consecutive referrals.
246

247   Pre-treatment assessment consisted of the ADIS-IV (Brown et al., 1994) and completion of
248   self-report questionnaires. The ADIS-IV was conducted by independent investigators (clinical
249   psychologists not involved with the treatment) trained in diagnostic interviewing. Patients
250   received no treatment whilst waiting for treatment to start. The wait time period was 3-4
251   months.
252

253   Five groups were held, each with 4-6 patients. The groups were held at Nidaros DPS, St.
254   Olavs Hospital. Patients were offered 10 weekly group sessions, each with a duration of 90
255   minutes. All self-report questionnaires were completed at pre-treatment, post-treatment, and
256   at 3-month follow-up. The first groups completed questionnaires on pen and paper at the
257   clinic, while the more recent groups completed questionnaires online. In addition, the
258   Generalized Anxiety Disorder Scale-Revised (GADS-R; Wells, 2009) was distributed before
259   the beginning of each treatment session. The study was approved by the Regional Committees
260   for Medical and Health Research Ethics (REK; 2013/2155, Helse Midt,
261   https://helseforskning.etikkom.no/).
262

263   **Therapists**
264   All groups were led by two therapists; a psychiatric nurse and a clinical psychologist. Both
265   had completed training in MCT and were registered level 1 and level 2 therapists respectfully.
266   Video supervision was conducted with a master clinician in MCT. Furthermore, several
267   groups had been conducted for training purposes before the open trial was initiated.
268

269   **Treatment**
270   The g-MCT had a specific structure and followed the treatment manual for GAD (Wells,
271   2009). Sessions one and two focused on creating a group case formulation. Participants were
272   helped to create their own personal case formulation. Participants were socialized to the
273   metacognitive model and introduced to the concept of detached mindfulness (detached
274   mindfulness; Wells, 2009). Sessions three and four focused on challenging metacognitive
275   beliefs regarding uncontrollability of worry and the belief that they would lose control if they
276   worried too much. In order to clarify conflicting and dysfunctional metacognitions, the group
277   was divided into two smaller groups and they constructed arguments for worry being
278   controllable or not, and if they could lose control or not. The participants then discussed and
279   challenged each other's beliefs, with help from the therapists.

280

281 In sessions five and six the primary aim of MCT was to reduce negative beliefs about the
282 dangers of worry. Both verbal and behavioural strategies were used to challenge
283 metacognitions. Examples of verbal strategies were questioning the evidence of
284 metacognitive beliefs and searching for counterclaims (as with beliefs about uncontrollability
285 in earlier sessions). Thereafter, in session 7 and 8, positive beliefs about worry were
286 challenged and modified.

287

288 The last phase of therapy (session 9 and 10) focused on relapse prevention. The group
289 members made a summary of their case formulation (therapy blueprint) and a summary ("old
290 and new plan") of how they used to respond to negative thoughts in the past and contrasted
291 this with their new adaptive responses to worrying thoughts.

292

293 **Measures**
294 The Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990) is a 16-item self-report
295 questionnaire measuring the severity of worry, both in terms of frequency, intensity and
296 uncontrollability. Each item is rated from 1 (*"not at all typical of me"*) to 5 (*"very typical of
297 me"*). The total score ranges from 16 to 80, where a higher score indicates higher levels of
298 pathological worry. It has excellent internal consistency (Cronbach $\alpha = .93$) and good
299 psychometric properties (Meyer et al., 1990). Cronbach's alpha in the current study was .97.

300

301 Generalized Anxiety Disorder-7 (GAD-7; Spitzer et al., 2006) is a self-report questionnaire
302 with seven items assessing symptoms of GAD. Patients answer how much during the last two
303 weeks they have been bothered by each symptom. The answer options range from 0 (*"not at
304 all"*) to 3 (*"almost every day"*), resulting in a total score between 0 and 21. A clinical cut-off
305 point of 10 has been suggested. GAD-7 has been shown to have excellent internal consistency
306 (Cronbach $\alpha = .92$) and good test-retest reliability ($r = 0.83$). It has also demonstrated good
307 criterion, construct, factorial, and procedural validity (Spitzer et al., 2006). Cronbach's alpha
308 in the current study was .89.

309

310 The Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001) is a self-report
311 questionnaire designed to measure symptoms of depression using nine items corresponding to
312 the nine criteria for depression. The patient answers how troublesome each problem has been
313 during the past two weeks, where each question is scored on a scale of 0 (*"not at all"*) to 3
314 (*"almost every day"*). The total score range from 0 to 27, of where a cut point of 10 identifies
315 major depression with good sensitivity and specificity (Kroenke et al., 2001). The PHQ-9 has
316 demonstrated excellent internal reliability (Cronbach $\alpha = .86$) and test-retest reliability, as
317 well as good construct and convergent validity (Kroenke et al., 2001). Cronbach's alpha in the
318 current study was .90.

319

320 Generalized Anxiety Disorder Scale-Revised (GADS-R; Wells, 2009) is a self-report
321 inventory based on the metacognitive model of GAD. The first items cover GAD symptoms,
322 time spent worrying, as well as how often a range of coping and avoidance behaviour have
323 been done the last week. These items are scored on a scale from 0 to 8. In addition, the
324 GADS-R assesses negative and positive metacognitive beliefs related to worry (Wells, 2009),
325 each measured on a scale from 0 (*"I do not believe this at all"*) to 100 (*"I'm completely
326 convinced this is true"*). Cronbach's alpha for the coping items was .94, .79 for avoidance
327 items, and .94 for the metacognitive belief items (.94 for negative beliefs and .93 for positive).

328

329 **Data analysis**

330 The feasibility of g-MCT was operationalized and visualized through the participant flow
331 chart (Figure 1), of where recruitment and retention rates are important feasibility outcomes.
332 The results are contrasted with the g-MCT study of van der Heiden et al. (2013).
333
334 A repeated measures ANOVA was used to investigate changes in worry and symptoms of
335 anxiety and depression. The same test was used to measure changes in metacognitions, coping
336 strategies, and avoidance. There was no significant skewness or kurtosis on pre-treatment
337 measures. Mauchly's test of sphericity was not significant for all analyses using repeated
338 measures ANOVA, except for PHQ-9, negative beliefs, and positive beliefs.
339
340 Effect sizes (Cohen, 1992) were calculated with Morris & Deshon's Equation No. 8, which
341 controls the correlation between pre- and post-treatment values of the dependent variable.
342 Following Jacobson and Truax (1991) and Fisher (2006), recovery (clinically significant
343 change on the PSWQ) was calculated with the following criteria: cut-off = 47, reliable change
344 index = 7. The study uses a cut-off point and a reliable change index that has been applied to
345 a large group of GAD patients and use the standardised criteria as described in Fisher (2006).
346 These criteria have been used in all other MCT studies for GAD except for the van der
347 Heiden et al. (2013) study. Using the standardised criteria allows benchmarking of the results
348 and allows a reasonable comparison between individual and group MCT. Along with effect
349 sizes, recovery rates were used to compare the treatment effectiveness of the current study
350 with previous studies of both individual and group based MCT for GAD.
351
352 Two patients did not complete questionnaires at follow-up. These values were replaced using
353 last observation carried forward (one classified as improved and one as a treatment non-
354 responder). There were no other missing values at pre-treatment, post-treatment, or follow-up.
355 Missing values for session-to-session data were not replaced.
356
357 Lastly, the potential influence of comorbid disorders on treatment outcome was investigated
358 using independent t-tests. The PSWQ, GAD-7, and PHQ-9 scores of patients with and
359 without comorbid disorders were compared at pre-treatment, post-treatment, and 3-month
360 follow-up.
361
362
363 **Results**
364
365 *Feasibility*
366 As shown in the participant flow chart (Figure 1), 45 patients were referred to and assessed
367 for inclusion in the current study. Twenty-three patients were entered into the study and 22
368 patients were excluded. The most common reason for exclusion was that GAD was not the
369 primary diagnosis ($n = 9$). Furthermore, two patients were excluded due to serious somatic
370 disorder, and another two patients were given inpatient treatment instead of outpatient
371 treatment because of their symptom severity and low level of functioning. Six patients
372 preferred individual treatment instead of group treatment, and three patients could not
373 participate in g-MCT due to practical difficulties. Therefore approximately 75% of suitable
374 patients were included in the study. More specifically, 28.1% i.e. 9 of the 32 offered g-MCT
375 declined.
376
377 Patients attended a mean of 8.9 (SD = 1.3). sessions. More specifically: one patient attended
378 five sessions (due to scheduling conflicts), two received seven sessions, four received eight
379 sessions, seven received nine sessions, and nine patients attended all ten sessions. Number of

380 sessions were not significantly correlated with symptoms at post-treatment ($r = .32$ $p = .13$) or
381 follow-up ($r = .35$, $p = .10$). Patients were asked to give their feedback on treatment
382 acceptability in the tenth and final treatment session. For each group, all patients reported that
383 they would have preferred group treatment rather than individual treatment because they were
384 able to meet other patients which enabled them to learn from each other, and that the group
385 setting reduced stigma related problems.
386
387 After completion of the open trial, the two therapists reported that delivering treatment in a
388 group format was clinically appropriate and that the small group format need not prevent any
389 patients from fully participating in the therapy. Furthermore, the clinicians plan to continue to
390 use g-MCT in their routine clinical practice as it is cost-effective and reduces the length of
391 time patients have to wait for treatment
392
393 No patients dropped out during treatment, but two patients did not complete the self-report
394 questionnaires at 3-month follow-up.
395
396 **Figure 1 here**
397
398
399 *Treatment effect*
400
401 Table 2 shows the mean and standard deviations for pre- and post-treatment scores and 3-
402 month follow-up. A repeated measures ANOVA was conducted to investigate changes.
403 Mauchley's test was not significant on any of the analyses (except for PHQ-9, and negative-
404 and positive metacognitions), and Wilks' lambda was therefore used. The results show
405 significant improvements and large effect sizes for all measures. Linear mixed model analysis
406 was also attempted with these data. However, all slopes went in the same direction as the
407 results were unambiguous. Furthermore, there were no significant fixed effects only a clear
408 effect of time. Model fit did not significantly improve when including attendance rate and age
409 into the model compared to a simple model.
410
411 **Table 2 here**
412
413 Changes in symptoms were significant from pre-treatment to post-treatment, and there were
414 non-significant changes from post-treatment to follow-up for all three measures. In addition to
415 tests of statistical significance, clinically significant change was investigated. Only one
416 patient did not respond to treatment. A summary of recovery rates are displayed in Table 3.
417
418 **Table 3 here**
419
420 Patients with comorbid disorders did not have significantly more symptoms than patients with
421 no comorbidity at any of the three times of assessment. For PSWQ there was no significant
422 difference at pre-treatment, $t(21) = 0.96$, $p = .35$, at post-treatment, $t(21) = 1.82$, $p = .08$, or
423 follow-up, $t(21) = 1.27$, $p = .22$. Five of the six (83.3%) patients without comorbid disorders
424 were recovered at follow-up compared to 76.5% for patients with comorbid disorders. For
425 GAD-7 there was also no difference at pre-treatment, $t(21) = 0.36$, $p = .73$, at post-treatment,
426 $t(21) = 0.55$, $p = .73$, or follow-up, $t(21) = .71$, $p = .49$. Same observation was made for PHQ-
427 9 at pre-treatment, $t(21) = 0.61$, $p = .55$, at post-treatment, $t(21) = 1.34$, $p = .19$, and at follow-
428 up, $t(21) = .32$, $p = .76$.
429

430 *Metacognitive changes from session to session*
431 GADS-R was completed by patients before every session to measure changes in symptoms,
432 worry, metacognitions, coping strategies, and avoidance.
433
434   **Table 4 here**
435
436
437 Table 4 shows a general decrease in all MCT related factors from session 1 to session 10. In
438 general, the graph shows that treatment was associated with reductions in symptoms, worry,
439 negative- and positive metacognitions, maladaptive coping strategies, and avoidance.
440
441 *Comparison with other GAD trials*
442 For benchmarking purposes, uncontrolled effect sizes (all outcome measures using the
443 PSWQ) were compared to the previously mentioned studies of MCT for GAD (Wells et al.,
444 2010; Nordahl et al., 2018; van der Heiden et al., 2012; van der Heiden et al., 2013). Figure 2
445 shows effect sizes (using pooled standard deviations) from pre-treatment to post-treatment
446 and from pre-treatment to follow-up for the various studies. The results suggested that
447 patients in the current study had obtained large reductions in symptoms of worry that were
448 comparable even with individual MCT for GAD. Patients in the current study had quite high
449 scores on PSWQ at pre-treatment, whereas post-treatment and follow-up scores were
450 comparable with results from individual MCT. T-tests comparing the results of the current
451 study with that of Wells et al. (2010) showed that the current study had a significantly higher
452 PSWQ pre-treatment score, $t(31) = 2.86$, $p = .007$, while there was no significant difference at
453 post-treatment, $t(31) = 0.14$, $p = .889$ and follow-up, $t(31) = 0.55$, $p = .587$.
454
455 The average number of therapist hours per patient in this study was 6.5 hours (10 session x
456 1.5 hrs x 2 therapists * 5 groups / 23 patients = 6.5), which accounts for fewer hours per
457 patient compared to van der Heiden et al. (2012) and Wells et al. (2010) which had 10-12
458 sessions (45-60 minutes each) per patient.
459
460   **Figure 2 here**
461
462
463 **Discussion**
464 The aims of the current study were to evaluate the feasibility and effectiveness of g-MCT for
465 patients with GAD within the context of an ordinary psychiatric clinic. As only a small
466 proportion of patients declined g-MCT in favour of individual MCT and no patients dropped
467 out during treatment, g-MCT appeared to be an acceptable treatment modality. Furthermore,
468 g-MCT was associated with significant reductions in worry and symptoms of anxiety and
469 depression. There were also significant reductions in all MCT related factors such as positive
470 metacognitive beliefs, negative metacognitive beliefs, and maladaptive coping strategies
471 (including avoidance behaviour). Session to session ratings indicated that the reduction in
472 symptoms, metacognition, and coping behaviour coincided with each other. However, due to
473 the design of the study, the results provide no clarity with respect to causal relationships. In
474 sum, large effect sizes and high recovery rates indicate that g-MCT is an effective treatment
475 for GAD.
476
477 With respect to treatment feasibility, 23 patients received treatment, while 22 patients were
478 excluded. GAD not being the primary diagnosis ($n = 9$) was the most common reason for
479 exclusion. Six patients (19 %) declined g-MCT in favour of individual MCT, and three

480   patients (9%) were unable to attend due to scheduling conflicts. Thus, 28% of participants
481   who were offered treatment chose not to participate. This rate is slightly higher compared to a
482   previous RCT study (19.8% [20 of 101 eligible patients]) offering individual treatment
483   (Nordahl et al., 2018). Group treatment could also be less flexible than individual treatment
484   which could exclude patients with set or busy schedules. On the other hand, a positive aspect
485   is that none of the included patients dropped out during treatment, suggesting that g-MCT was
486   accepted by the participants. Furthermore, the average number of therapist hours per patient
487   in this study was 6.5 hours, which accounts for fewer hours per patient compared to studies
488   using individual therapy (typically 10-12 sessions). Thus, g-MCT appear to be a cost-
489   effective treatment method.
490
491   According to benchmarking analyses, patients in the current study had quite high scores on
492   PSWQ at pre-treatment, while post-treatment and follow-up scores were comparable to
493   previous investigations of individual MCT for GAD (Wells et al., 2010; Nordahl et al., 2018;
494   van der Heiden et al., 2012). The recovery rate (PSWQ) at post-treatment in this study was
495   65.3%, which is somewhat lower than Wells et al. (2010). This might be explained by the
496   high pre-treatment scores in the current study. However, the recovery rate increased to 78.3%
497   at 3-month follow-up, which is in line with results from individual MCT. The group study of
498   van der Heiden et al. (2013) showed somewhat lower recovery rates than the current study. It
499   could be speculated that this is related to differences in group size (4-6 patients vs. 10-14
500   patients per group), but it could also be related to therapist factors, as two of their four
501   therapists had not received MCT training. When comparing uncontrolled within effect sizes
502   for studies on MCT for GAD, the current study showed promising results. However, the
503   effect size estimation could be inflated and influenced by the relatively small sample size. The
504   results are also encouraging when compared to recovery rates in CBT. As previously
505   mentioned 50-60% are recovered following CBT for GAD (Fisher & Durham, 1999), and
506   only 38% were recovered in a recent study (Nordahl et al., 2018).
507
508   Group-MCT was associated with significant reductions in positive and negative
509   metacognitions. The reduction was greater for the negative metacognitive beliefs than for
510   positive beliefs. A possible explanation could be that patients reported fewer positive than
511   negative metacognitive beliefs at the start of treatment.
512
513   Treatment was also associated with reduction in symptoms of depression and comorbidity did
514   not affect treatment outcome. This is an appealing aspect of treatment given the high rate of
515   comorbidity (and overlap in symptoms) between GAD and depression. This finding is also
516   consistent with studies showing that MCT has an effect on comorbid disorders (e.g.
517   Capobianco et al., 2018; Johnson et al., 2017; Papageorgiou et al., 2018). The fact that
518   treatment reduced comorbid symptoms of depression is also consistent with a metacognitive
519   understanding of common underlying psychological processes in emotional disorders, and
520   therefore supports a transdiagnostic utility of MCT.
521
522   The study is not without limitations. The most obvious is the open trial design lacking a
523   control group. Therefore, the study is unable to control for random fluctuations, spontaneous
524   recovery, or effect of external variables. Evaluation of treatment effectiveness was also based
525   on self-reported symptoms, which poses certain limitations such as social desirability.
526   However, this effect could also be present for interview based ratings. Diagnostic re-
527   assessment at long term follow-up is ongoing. Another issue is that it was a predominantly a
528   female sample, as well as a probable overrepresentation of patients with comorbid OCD. A
529   strength of the study is however that treatment outcomes were comparable for patients with

530 and without comorbid disorders. Furthermore, there was no official measure of adherence.
531 However, video supervision was conducted with an international expert in MCT and several
532 groups had been conducted for training purposes before the open trial was initiated. Another
533 issue is that diagnostic interviews were not videotaped and there is no measure of inter-rater
534 agreement. Sample size is also an issue for the comorbidity analyses and comparing results
535 across treatment studies is not always straightforward as samples and conditions may vary.
536
537 In conclusion, the results of this study show that g-MCT was a suitable and effective
538 treatment for patients with GAD. Treatment was associated with significant reductions in
539 worry, anxiety, dysfunctional metacognitions, and coping strategies. It was also associated
540 with significant improvement in symptoms of depression, which supports the transdiagnostic
541 effects of MCT. Effect sizes were high and recovery rates were comparable to previous
542 studies. The study supports further evaluation of group-MCT for patients with GAD using
543 larger sample sizes and controlled designs.
544

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Tables

Table 1. *Demographic and Diagnostic Characteristics of the Sample (N = 23)*

	n	%
Female	22	95.7
Single	7	30.4
Married/cohabitant	16	69.6
Full time employed	11	47.8
Student	8	34.8
Welfare benefits	4	17.4
Current use of antidepressants	4	17.4
Previous psychiatric outpatient treatment	22	95.7
Comorbidity		
Obsessive-compulsive disorder	6	26.1
Depression	4	17.4
Panic disorder	4	17.4
Social anxiety disorder	2	8.7
Specific phobia	1	4.3
Health anxiety	1	4.3
ADHD	2	8.7

Note. Patients diagnosed with ADHD were already diagnosed with ADHD as described in their referral.

705 **Table 2.** Repeated Measures ANOVA Testing Change in Symptoms and Metacognitions.

	Pre	Post	F-U	*F*	Part. Eta sq.	*d*	*d*
		M(SD)				*Post*	*Follow-up*
PSWQ	71.52 (5.97)	38.35 (14.02)	35.04 (13.71)	78.38***	.88	2.42	2.95
GAD-7	14.17 (3.97)	3.83 (3.38)	3.70 (2.77)	78.39***	.88	2.30	2.34
PHQ-9	13.87 (5.55)	4.70 (4.03)	4.91 (5.11)	32.15***	.75	1.76	1.38
GADS-R							
Negative	67.17 (21.70)	4.71 (12.62)	4.78 (12.50)	136.62***	.86	2.55	2.56
Positive	29.78 (25.87)	2.97 (6.19)	1.88 (4.06)	23.51***	.52	1.11	1.34
Coping	4.35 (1.21)	0.76 (0.90)	0.79 (0.84)	91.04***	.90	2.54	2.82
Avoidance	2.96 (1.31)	0.38 (0.67)	0.44 (0.68)	45.37***	.81	2.00	2.13

706 *Note.* Greenhouse-Geisser correction used for PHQ-9, and negative- and positive beliefs.
707 Effect sizes (Cohen's *d,* 1992) were calculated using Morris & Deshon's equation nr. 8
708 controlling for correlation between pre- and post-treatment value for the variable in question.
709 PSWQ = Penn State Worry Questionnaire, GAD-7 = Generalized Anxiety Disorder-7, PHQ-9
710 = Patient Health Questionnaire-9, GADS-R = Generalized Anxiety Disorder Scale-Revised.
711

712 **Table 3**. Recovery rates (percentages) at post-treatment and follow-up

	Deterioration	No change	Improved	Recovered
PSWQ				
Post-treatment	0.0	4.3	30.4	65.3
Follow-up	0.0	4.3	17.4	78.3
GAD-7				
Post-treatment	0.0	4.3	8.7	87.0
Follow-up	0.0	0.0	21.7	78.3
PHQ-9				
Post-treatment	0.0	8.7	39.1	52.2
Follow-up	0.0	13.0	21.7	65.3

713 *Note*. PSWQ = Penn State Worry Questionnaire, GAD-7 = Generalized Anxiety Disorder-7,
714 PHQ-9 = Patient Health Questionnaire-9. Cut-off values for GAD-7 and PHQ-9 was set at >
715 10. Improved = at least 7-points improvement on PSWQ or below cut-off. Recovered =
716 criterion for improved and scoring 47 or less on PSWQ. 91.3% of participants scored above
717 cut-off on GAD-7 at pre-treatment, and 73.9% scored above cut-off on PHQ-9. The two
718 patients that scored below cut-off on GAD-7 at pre-treatment were not classified as recovered
719 (probably due to low pre-treatment values).
720

721 **Table 4**. Changes on GADS-R from session to session

	Symptoms		Worry		Negative beliefs		Positive beliefs		Coping strategies		Avoidance	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Pre	5.3	1.1	5.5	1.3	5.4	1.7	2.4	2.1	4.3	1.2	3.0	1.3
1	5.4	1.1	5.2	0.9	5.3	1.2	3.0	2.3	4.4	1.0	2.6	1.0
2	4.9	1.3	5.0	1.4	4.4	1.7	2.0	1.7	3.6	1.2	2.0	1.2
3	4.3	1.4	4.2	1.7	3.5	1.6	1.4	1.3	3.2	1.3	1.7	1.1
4	4.1	1.6	3.9	2.0	3.2	1.9	1.2	1.2	2.6	1.6	1.4	1.1
5	3.8	1.8	3.4	1.8	2.1	1.8	0.9	0.9	2.0	1.3	1.1	1.1
6	3.4	1.6	2.5	1.7	1.8	1.8	0.5	0.8	1.6	1.2	0.7	0.6
7	2.4	1.3	1.8	1.2	0.8	1.1	0.5	0.9	1.1	1.0	0.6	0.7
8	2.3	1.8	1.8	1.4	0.6	1.1	0.4	0.7	1.1	1.2	0.6	0.8
9	2.3	2.0	1.8	1.7	0.5	0.8	0.2	0.6	0.8	0.7	0.4	0.5
Post	2.0	1.4	1.3	1.3	0.2	0.3	0.2	0.5	0.7	0.9	0.3	0.6
F-U	1.4	1.2	1.0	1.0	0.1	0.2	0.1	0.1	0.5	0.6	0.2	0.6

722 *Note*. Changes from session to session (pre-treatment to 3-month follow-up) in GAD
723 symptoms, worry, negative- and positive metacognitions, maladaptive coping strategies, and
724 avoidance. All scores are transformed to a 0-8 scale.

725 **Figures**
726
727
728 **Figure 1.** Flow chart
729
730
731 **Figure 2.** Comparison of uncontrolled effect sizes in GAD trials using MCT.
732
733 *Note.* All data are based on intention-to-treat and effect sizes are calculated using pooled
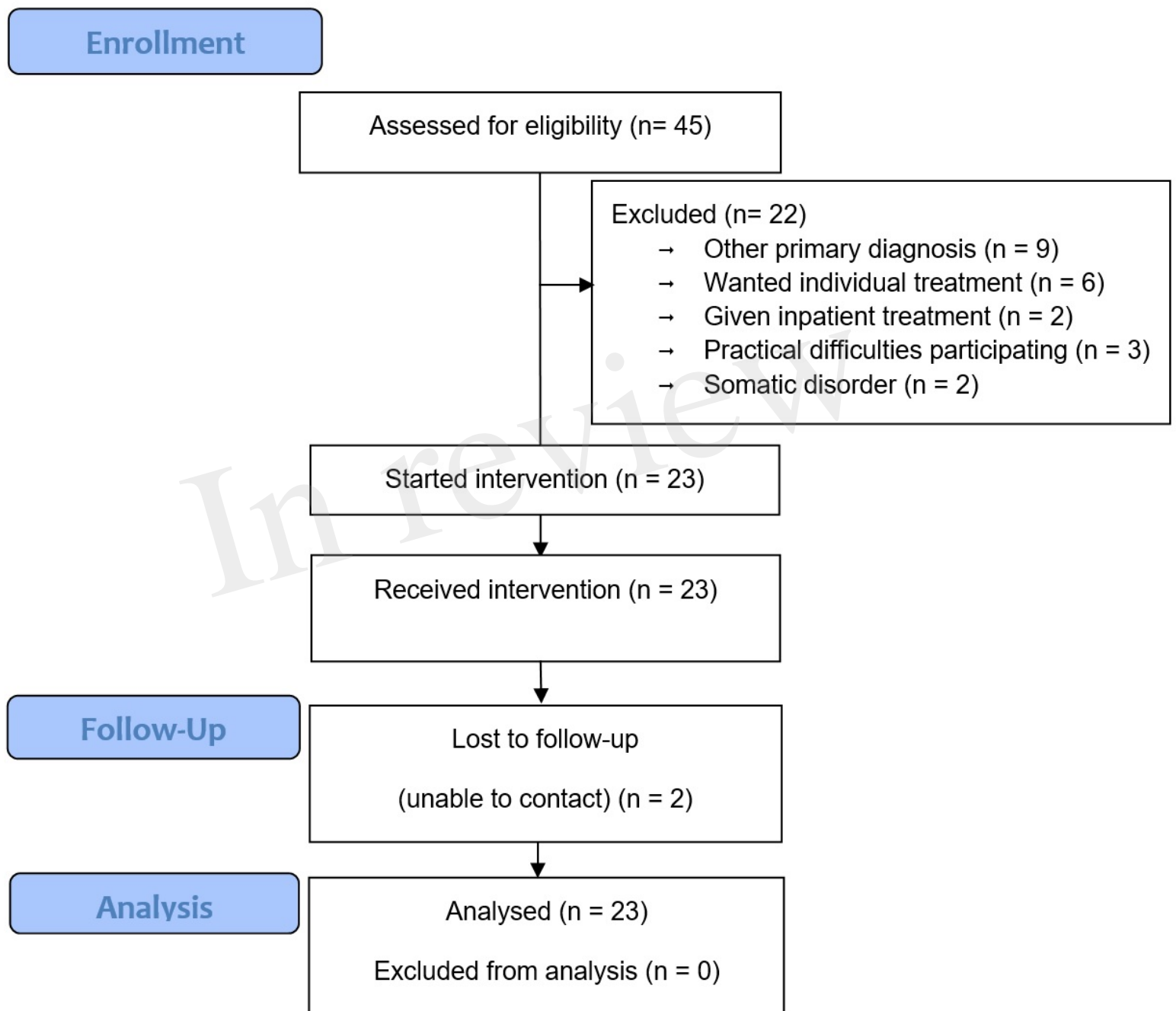734 standard deviations. All outcomes are assessed using the PSWQ.
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Figure 1.JPEG

Figure 2.JPEG