

The efficacy of group metacognitive therapy for children (MCT-c) with generalized anxiety disorder: An open trial



Barbara Hoff Esbjørn*, Nicoline Normann, Bianca Munkebo Christiansen, Marie Louise Reinholdt-Dunne

Department of Psychology, University of Copenhagen, Øster Farimagsgade 2A, 1353 Copenhagen K, Denmark

ARTICLE INFO

Keywords:

Generalized anxiety
Metacognitive therapy
Children
Disorder-specific treatment
Efficacy

ABSTRACT

Metacognitive therapy is an effective treatment for anxiety disorders in adults. Studies have demonstrated that the underlying theoretical model is also supported in children. It has therefore been suggested that metacognitive therapy for children may be effective. Our study is an open trial of metacognitive therapy for children with generalized anxiety as their primary disorder. Therapy was provided in groups. Families were interviewed with the Anxiety Disorders Interview Schedule – child/parent versions. They reported on the child's anxiety levels using the Revised Childrens Anxiety and Depression Scale – child/parent versions. Children reported on metacognitive beliefs using the Metacognitions Questionnaire for Children – 30 item version. Forty-four children aged 7–13 years (50% girls) were enrolled, and one family dropped out during treatment. Fifty percent of the children had received counseling or psychological treatment for their anxiety disorder previously. Following treatment, 86.4% of the children were free of their primary disorder and 72.7% were free of all anxiety disorders, the corresponding figures were 75% and 65.9% at 6-months follow-up. The effect sizes were large for all measures and clinically significant improvements were obtained for 70% of the children at posttest and 77% at follow-up. Our study suggests that metacognitive therapy for children with generalized anxiety disorder may be a highly promising treatment approach.

1. Introduction

Two decades ago, Wells (1995) developed metacognitive therapy (MCT) based on a corresponding metacognitive model (MCM) of psychological disorder. The metacognitive model states that what causes disorders is not the negative content of thoughts, but rather the metacognitive beliefs held by the client. In the case of generalized anxiety disorder (GAD), anxiety is maintained by the client's positive metacognitive beliefs that engaging in worry may help the client be prepared for negative events in the future and by negative metacognitive beliefs that worry is uncontrollable and dangerous. Furthermore, unhelpful attentional deployment, coping strategies such as worry and thought suppression, and behaviours such as avoidance and reassurance seeking together constitute a cognitive attentional syndrome which maintains the metacognitive beliefs and thereby the anxiety (Wells, 2009). As the effect of the traditional cognitive behavioral therapies (CBT) has shown to be only modest when treating GAD (Wells & Carter, 2001), researchers have begun to investigate the effects of MCT in the treatment of anxiety disorders in adults. The adult literature has shown substantial support for the metacognitive model (for a review see: Wells,

2009) and therapy in treating anxiety disorders (e.g., Kvistedal, 2011; Rees & van Koesveld, 2008; van der Heiden, Muris, & van der Molen, 2012; Wells & Colbear, 2012). Although further studies are warranted before firm conclusions can be drawn, a recent meta-analysis suggested that the effect of MCT may be larger than that of CBT in treating these disorders (between-group Hedges' $g = 0.97$; Normann, van Emmerik, & Morina, 2014).

As more than one third of anxious adults aged 32 years report that they have had an anxiety disorder before the age of 15 years (Gregory et al., 2007), it is pivotal that treatments are developed and adapted for the use with children. The need for effective treatments in childhood populations is supported by the fact that anxiety disorders are one of the most common psychiatric disorders in childhood with 12% of 9–11-year olds having fulfilled criteria for an anxiety disorder. This percentage increases to 23% in young adulthood (Copeland, Angold, Shanahan, & Costello, 2014).

The most commonly investigated treatment for childhood anxiety disorders is CBT. CBT is an overall term for different treatments applying standard CBT techniques with a focus on working with the reciprocity of emotions, the content of thoughts and behaviours. The aim

* Corresponding author.

E-mail address: barbara.hoff@psy.ku.dk (B.H. Esbjørn).

of CBT is to identify the patient's cognitive distortions in order to reality test them, thus, leading the patient to obtain new skills and challenge irrational thoughts and beliefs by using rational thinking (James, James, Cowdrey, Soler, & Choke, 2013). CBT is well-established for use with children and adolescents. The treatment is generally well-accepted by the children and their families and dropout rates are low. For instance, the Child/Adolescent Anxiety Multimodal Study (CAMS) reported a dropout rate of 4.3% in the CBT alone condition compared to 17.3% in the sertraline alone condition (Piacentini et al., 2014). CBT also has a solid empirical evidence base for the effectiveness of the intervention; a Cochrane review reported that 59% of children who were enrolled in a minimum of 8 weeks of treatment were free of all anxiety disorders following CBT (James et al., 2013). A meta-analysis revealed that the mean effect size of different types of CBT on self-reported anxiety symptoms was 0.74 with a 95% confidence interval of 0.60–0.82 (Ishikawa, Okajima, Matsuoka, & Sakano, 2007). As approximately 40% of the children continue to meet diagnostic criteria for one or more anxiety disorders, there is room for improvement. MCT has proven promising in treatment of adult anxiety, and we suggest further investigation of this treatment in children with anxiety disorders. In this paper, we will focus on MCT for children with GAD. We do this for two reasons. One is that disorder-specific treatment models may be one pathway for gaining larger treatment effects. Another is that MCT for GAD in adults so far is the treatment protocol that has been most thoroughly tested and thus has the strongest evidence base. Furthermore, MCT for GAD has been included in the NHS NICE guidelines for GAD (NICE, 2012).

1.1. The metacognitive model for generalized anxiety disorder

MCT is based on a substantive theory of psychological disorder. The metacognitive model suggests that psychopathology is caused by unhelpful metacognitive beliefs that control the patient's attention, cognitions and behaviours. Research has shown that patients suffering from GAD hold both positive and negative metacognitive beliefs about worry (e.g., Ruscio & Borkovec, 2004; Wells & Carter, 2001). Positive metacognitive beliefs about worry consist of beliefs that worry may be beneficial and keep the patient from future harm. Believing that worry is beneficial has been found to increase the likelihood that worry will be applied as a coping strategy (Wells, 2009). Although findings are ambiguous, the literature suggests that all adults hold positive metacognitive beliefs to some extent (Cartwright-Hatton & Wells, 1997; Wells & Carter, 2001). However, according to theory, it is the negative metacognitive beliefs that distinguish normal from pathological worry. As such, patients with GAD hold negative metacognitive beliefs about worry as uncontrollable and that worry may be dangerous (Barahmand, 2009; Cartwright-Hatton & Wells, 1997; Wells & Carter, 2001). This association has also been found in community studies (Davis & Valentiner, 2000; Spada et al., 2012; Spada, Mohiyeddini, & Wells, 2008). These beliefs play a key role in maintaining the disorder (Wells, 2009) and are core features in the diagnostic criteria of GAD accompanied with at least one physiological symptom as seen in the DSM-5 (American Psychiatric Association, 2013).

1.2. Metacognitive therapy

Therapeutically, MCT for adults targets these core metacognitive beliefs using verbal and behavioral techniques and experiments. These are thoroughly explained in Wells (2009). One very important technique in MCT for GAD is detached mindfulness, which teaches the patient to engage in his/her experiences in a metacognitive mode. Here the patient may notice a negative thought that would normally trigger a worry process, but by using detached mindfulness, the patient does not pay attention to it, but rather continues with his or her business, leaving the thought to itself. In traditional CBT, the patient would learn to identify the negative thoughts and evaluate the probability of these,

leading to a cognitive restructuring of the thoughts from catastrophizing to more realistic. MCT differs from CBT by engaging the client in a metacognitive mode of thinking, where negative thoughts are dealt with by choosing not to engage with them rather than starting to analyze them (Wells, 2009). Applying detached mindfulness is one way to challenge the person's negative metacognitive beliefs about the uncontrollability of worry, as it creates counterevidence, thus leading the way for the person to develop more adaptive beliefs about worry (Wells, 2009).

1.3. Metacognitions in children

The first step in applying treatment components and techniques as those described above in childhood samples, is to examine if children are capable of performing the cognitive tasks required to engage in the described theory and treatment. Childhood researchers have found support for applying the metacognitive model in children (for a review, see Ellis & Hudson, 2010). Research suggests that the metacognitive development begins in middle childhood and continues through adolescence and into adulthood (Flavell, 1979; Flavell, Green, & Flavell, 2000; Pillow, 2008). Children as early as 3–4 years of age begin to develop an understanding of the possible influence of previous knowledge, emotions, attention focus, beliefs and desires on the mental state (Pillow, 2008). Further, a series of studies found that 6–7 year old children were more likely to comprehend that a person waiting quietly is able to have thoughts and ideas contrary to being empty of thoughts and ideas (Flavell, 1979; Pillow, 2008). This indicates the understanding of thoughts as a stream of consciousness in which children are able to have thoughts about their thoughts. Thus, findings from the developmental literature suggest that children from the age of 6 or 7 years are able to understand and operate at a metacognitive level. Furthermore, several studies of clinical samples of children and adolescents with anxiety disorders have also found overall support for the MCM (Cartwright-Hatton et al., 2004; Esbjørn, Lønfeldt et al., 2015; Smith & Hudson, 2013), although some researchers report ambiguous findings not fully supporting the application of the MCM to children and adolescents (Bacow, May, Brody, & Pincus, 2009).

Overall, the literature suggests that MCT may be feasible with children. None-the-less, only two studies exist that have examined MCT in childhood samples (Esbjørn, Normann, & Reinholdt-Dunne, 2015; Simons, Schneider, & Herpertz-Dahlmann, 2006). The first study to be published, examined the effect of MCT for pediatric OCD (Simons et al., 2006). The authors compared a traditional CBT method, exposure and response prevention, to MCT with five cases in each group and draw the preliminary conclusion that MCT may be a promising alternative to traditional CBT methods. The second study examined an adaptation of MCT from adults to children and provided suggestions for a manual for group based metacognitive therapy for children with GAD (MCT-c; Esbjørn, Normann, & Reinholdt-Dunne., 2015). The study reported results on four children aged 11–12 years. No children dropped out of therapy, and the reliable change index scores indicated clinically significant improvements in three out of the four children. Overall, the results suggest that the adaptation of MCT-c from adults to children was successful. Although previous studies suggested that MCT for children may be a promising supplement to CBT, the evidence does not yet warrant firm conclusions.

The purpose of the present study was therefore to extend previous findings and explore the efficacy of the MCT-c manual (Esbjørn, Normann, & Reinholdt-Dunne, 2015) by conducting an open trial for children with GAD in a larger clinical sample. Based on the adult literature on MCT, and the mentioned case study on MCT-c, we hypothesized that MCT-c would be effective in treating GAD in children.

2. Method

2.1. Design and procedure

The participating families were recruited from parents' self-referrals regarding their child's anxiety to Center for Anxiety, a university clinic at University of Copenhagen. Children were included in the current project if they (1) were between 7 and 13 years of age, (2) had a primary diagnosis of GAD according to ADIS-C/P (Silverman & Albano, 1996) as reported by the combined score from the child and the parents, (3) had an IQ screening ≥ 70 , and (4) had at least one parent who was a native speaker of Danish. Prior to entering the study, parents gave written informed consent and children gave assent to participate. The study was approved by the Ethical Review Board at the Department of Psychology, University of Copenhagen.

2.2. Participants

A total of 45 families were eligible for participation. Of all the families that were offered treatment, one family declined participation because the treatment was scheduled during work hours. As a result, 44 families entered the study between September 2013 and October 2015. One family (2.3%) dropped out during the active treatment phase, and another four families (9.1%) were lost to follow-up. Reasons for not participating in the follow-up assessment included (1) two children were receiving treatment in the psychiatric ward and thus the family did not have the energy and time to participate, (2) one mother was very sick of cancer and thus the family did not have the energy to participate, and (3) one family did not wish to participate because the testing was scheduled during work hours, but reported that the child was free of his anxiety. Of the remaining participants, four families (9.1%) received additional treatment during the six month follow-up period. The additional treatment was carried out at Center for Anxiety, and consisted of three to six metacognitive therapy booster sessions, except for one child that received CBT for a specific phobia for dogs. Fig. 1 summarizes the participant flow during the trial.

2.3. Measures

The Danish versions of the following measures were administered before treatment commencement, directly after, and at six months follow-up.

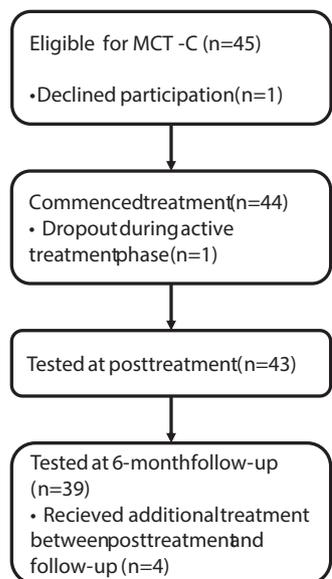


Fig. 1. Flowchart over participants.

2.3.1. Anxiety disorders interview schedule for DSM-IV (ADIS-IV) (Silverman & Albano, 1996)

The ADIS-IV is a diagnostic interview for children and their parents, respectively. It assesses the presence of anxiety disorders, depressive disorders and other disorders that occur in youth that correspond to the criteria set by DSM-IV (American Psychiatric Association, 1994). The clinical severity of a disorder is determined on a scale from 0 to 8, with scores ≥ 4 considered to be diagnostically significant. In the current study, a composite diagnosis including parent and child report was used to create the overall diagnostic status, and this was chosen as the primary outcome measure. ADIS-IV has shown to be a reliable and valid instrument for assessing mental disorders (Lyneham, Abbott, & Rapee, 2007; Silverman, Saavedra & Pina, 2001; Wood, Piacentini, Bergman, McCracken & Barrios, 2002). In the current study, assessors at post-treatment and follow-up were blinded to the diagnostic classification given at intake as well as type of treatment, as they assessed both the enrolled children and children who had received other types of treatment in the clinic. All assessors received intensive training in conducting the interview and ongoing videosupervision by a trained clinician throughout the project period to increase reliability in assessment.

2.3.2. Revised child anxiety and depression scale (RCADS; Chorpita, Yim, Moffitt, Umemoto, & Francis, 2000)

The RCADS is a 47-item measure of anxiety and depressive symptoms in children. It assesses symptoms of generalized anxiety disorder, social phobia, separation anxiety disorder, panic disorder, obsessive-compulsive disorder and depression. Each item is scored on a 4-point Likert scale ranging from 0 (never) to 3 (always). Both the child and parent versions of the scale were used. For the purpose of this study, the total anxiety score was used independently for parents and child. The Danish version of the scale has shown satisfactory psychometric properties (Esbjørn, Sømshovd, Turnstedt, & Reinholdt-Dunne, 2012). In the present study, Cronbach's α for the total anxiety scale ranged between 0.88 and 0.95.

2.3.3. Penn state worry questionnaire for children (PSWQ-C; Chorpita, Tracey, Brown, Collica, & Barlow, 1997)

The PSWQ-C is a self-report measure of the child's tendency to worry. It consists of 14 items that are rated on a scale from 0 (never) to 3 (always), with higher scores indicating greater tendency to worry. The Danish version of the scale has demonstrated adequate convergent validity and high internal consistency (Esbjørn, Reinholdt-Dunne, Caspersen, Christensen, & Chorpita, 2013). In the present study, Cronbach's α ranged from 0.85 to 0.90 across the three time points.

2.3.4. Metacognitions questionnaire for children (MCQ-C₃₀; Esbjørn, Sømshovd et al., 2013)

This 30-item questionnaire assesses children's metacognitive beliefs and processes across five scales: positive beliefs about worry; negative beliefs about the uncontrollability and dangerousness of worry; need to control thoughts; cognitive self-consciousness; and cognitive confidence. Each statement is rated on a 4-point scale ranging from 1 (not at all) to 4 (completely), with higher scores indicating stronger metacognitive beliefs or greater use of maladaptive metacognitive processes. The Danish version of the scale has demonstrated adequate psychometric qualities (Esbjørn, Sømshovd et al., 2013). In the present study, Cronbach's α for the total scale ranged between 0.86 and 0.87 across the three time points. The measure was included in the current study as a cognitive process measure that is directly targeted in therapy.

2.3.5. Wechsler intelligence scale for children – third edition (WISC-III; Wechsler et al., 1991)

The WISC-III is a standardised assessment tool of intellectual functioning of children. Information, Vocabulary, Picture Completion and Block Design were used to calculate an estimated full scale IQ. The WISC-III has demonstrated adequate psychometric properties (Wechsler

et al., 1991).

2.3.6. Wechsler intelligence scale for children – fourth edition (WISC-IV; Wechsler, 2010) is an updated and adjusted version of the WISC-III

When changing procedures to the new WISC, only two subtests, Vocabulary and Matrix Reasoning, were assessed and used to calculate an estimated full IQ scale. The selected subtests were the most highly correlated with the full scale IQ (Wechsler, 2010). The Danish version of the scale has demonstrated sound psychometric properties (Wechsler, 2010).

2.4. Treatment

All families received manual based group MCT for children, which is a developmental adjustment of MCT for adults with GAD (Wells, 2009). The development of the manual has been described in detail elsewhere (Esbjørn, Normann, & Reinholdt-Dunne, 2015). Eight groups were held, with five to six children and three to four therapists in each group. In short, the treatment consisted of eight weekly two-hour group sessions for the children and two workshops for the parents. Parent workshops of two hours were held prior to treatment of the child and four weeks into treatment. A voluntary group booster session was held for both children and their parents approximately five weeks after treatment had ended. During treatment, children were socialized to the metacognitive model and the cognitive attentional syndrome. Attention training, situational attentional refocusing where the children practice refocusing attention between thoughts and stimuli in the surroundings, and detached mindfulness were practiced. Attention training was added to the treatment of children as it provides a concrete way of understanding the voluntary shifting of attention between stimuli. This helped the children to better understand detached mindfulness. Metacognitive beliefs were challenged verbally and through various experiments. New behaviors were practiced by teaching the child to engage in detached mindfulness as a response to thoughts triggering worry while at the same time seeking out situations that elicited the child's triggers. In traditional CBT, seeking out anxiety provoking situations as part of an exposure may be either to habituate to the anxious feelings or to violate the expectancies of learned association between stimulus and response (Craske, Treanor, Conway, Zbozinek, & Vervliet, 2014). In contrast, the object of seeking out anxiety provoking situations in MCT-C was to produce metacognitive change and for the child to experience that reactions to trigger thoughts were under voluntary control. Techniques were reinforced by using rewards, worksheets, in-session experiments and field-trips, and a board game as part of the therapy. For detailed information on contents of each session see Esbjørn, Normann, and Reinholdt-Dunne (2015).

2.5. Therapists

The second author conducted all therapies, together with two other therapists. In all but one group, one of the authors participated as co-therapists. In all groups, psychology students finishing their master in clinical psychology also participated as the third therapist. Treatments were supervised by the first-author who is a professor in clinical child psychology, as well as a specialist in psychotherapy. To ensure that the metacognitive techniques were conducted correctly, therapists also received supervision by a supervisor who was trained in metacognitive therapy for adults.

3. Results

3.1. Descriptive statistics

The sample consisted of 22 girls and 22 boys, and all children were ethnic Danish. Their mean age was 9.68 (SD 1.60, range 7–13 years). The mean severity rating of GAD was 6.32 (SD 0.88). The majority of

Table 1
Demographic characteristics of the participating parents.

	Mother	Father
Mean age	40.05 (SD 5.17)	42.02 (SD 5.03)
Civil status: cohabiting or married	76.70%	85.40%
Education: medium and long academic	88.30%	70.70%
Household yearly income of ≥750,000 DKK or above (≈111,000 USD)	39.50%	53.70%

the children were comorbid with other disorders. The mean number of diagnoses was 2.55 (SD 1.04, range 1–6). According to the ADIS-C/P, 15.9% only fulfilled criteria for GAD, 31.8% had one comorbid disorder, and 52.3% had two or more comorbid disorders. The comorbid disorders included separation anxiety disorder ($n = 22$), specific phobia ($n = 18$), social phobia ($n = 14$), oppositional defiant disorder ($n = 4$), dysthymia ($n = 3$), agoraphobia ($n = 2$), attention deficit hyperactivity disorder ($n = 2$), panic disorder ($n = 1$), depression ($n = 1$), posttraumatic stress disorder ($n = 1$). Table 1 displays the demographic characteristics of the families. A large proportion of the families ($n = 22$, 50%) had previously received psychological counselling or therapy for their child's difficulties. None of the participants were taking psychotropic medication.

An IQ screening was performed on all children. They were screened with either four subtests from the WISC-III (Picture Completion, Block Design, Information, and Vocabulary) ($n = 21$) or with two subtests from the WISC-IV (Vocabulary and Matrix Reasoning) ($n = 23$). The average estimated total IQ was 105.5 (SD 17.71). Analyses of treatment effects were conducted for all families entering treatment, by using intent-to-treat analyses with the last-observation-carried-forward procedure.

3.1.1. Diagnostic status

At posttreatment, 86.4% ($n = 38$) of the children were free of their primary disorder and 72.7% ($n = 32$) were free of all anxiety disorders according to the ADIS-C/P. At follow-up, 75% ($n = 33$) were free of their primary disorder and 65.9% ($n = 29$) were free of all their anxiety disorders.

3.1.2. Questionnaire measures

Table 2 displays the mean scores and standard deviations on the outcome measures of parent-reported anxiety and child-reported anxiety and worry across the three time points. Overall changes in these measures across time were examined using repeated measures ANOVAS. A significant reduction across time was found for RCADS child, mother, and father report, as well as the PSWQ-C. Pairwise comparisons were inspected in order to examine whether there was a significant improvement in anxiety and worry symptoms from pretreatment to follow-up. The child's report on anxiety and worry showed significant reductions from pretreatment to posttreatment but also from post-treatment to follow-up. The mother and father's report indicated a significant reduction in anxiety symptoms from pretreatment to post-treatment. Although there were further reductions from posttreatment to follow-up, these changes were not significant. In order to closer inspect the magnitude of improvement, effect sizes (Cohen's d) were calculated for pretreatment to posttreatment and pretreatment to follow-up changes. Values of 0.2, 0.5, and 0.8 refer to small, medium, and large effect sizes, respectively (Cohen, 1988).

The means and standard deviations for the MCQ-C₃₀ and its subscales are displayed in Table 3. Repeated measures ANOVA revealed significant reductions across time for the MCQ total scale, $F(1,43) = 51.07$, $p < 0.001$. Except for cognitive confidence, all subscales had a significant reduction ($p < 0.05$) from pre- to posttreatment. Except for the positive beliefs subscale, this reduction was maintained at follow-up. Pairwise comparisons showed a significant reduction in

Table 2

Mean scores, (standard deviations), F statistics, and effect sizes for the outcome measures at pretreatment, posttreatment and follow-up.

Measure	Pretreatment	Posttreatment	6 month follow-up	Test statistic	Cohen's <i>d</i> pretreatment to posttreatment	Cohen's <i>d</i> pretreatment to follow-up
RCADS _{child}	41.56 (16.26)	24.61 (17.47)	20.33 (15.43)	F(1,43) = 70.54***	1.20	1.26
PSWQ-C	24.73 (8.34)	16.57 (8.58)	14.44 (8.03)	F(1,43) = 47.27***	0.95	1.04
RCADS _{mother}	45.64 (14.26)	27.10 (15.04)	24.70 (15.05)	F(1,42) = 71.11***	1.29	1.28
RCADS _{father}	41.31 (13.98)	25.91 (12.18)	24.47 (14.90)	F(1,41) = 33.79***	0.98	0.90

Note. RCADS = Revised Child Anxiety and Depression Scale (total anxiety scale), PSWQ-C = Penn State Worry Questionnaire for Children. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Table 3Mean scores (and standard deviations) for MCQ-C₃₀ scores across the three time points.

Measure	Pretreatment	Posttreatment	Follow-up
MCQ-C ₃₀ total	58.59 (11.52)	46.94 (10.33)	45.28 (10.77)
MCQ-C ₃₀ positive beliefs	7.98 (1.93)	6.91 (1.78)	7.34 (2.34)
MCQ-C ₃₀ negative beliefs	15.20 (4.07)	11.15 (3.14)	10.48 (3.59)
MCQ-C ₃₀ cognitive confidence	9.82 (3.34)	9.43 (3.2)	8.43 (2.61)
MCQ-C ₃₀ need for control	11.61 (3.24)	8.95 (2.41)	8.77 (2.59)
MCQ-C ₃₀ cognitive self-consciousness	14.00 (3.51)	10.50 (3.17)	10.28 (3.80)

Note: Except for the cognitive confidence subscale, the total score and all other subscales had a significant reduction ($p < 0.05$) from pre- to posttreatment. Except for the positive beliefs subscale, this reduction was maintained at follow-up.

metacognitions from pretreatment to posttreatment, but not from posttreatment to follow up. The effect size for the total MCQ-C₃₀ was 0.84 from pre- to posttreatment and 1.08 from pretreatment to follow-up.

3.1.3. Clinically significant change

Based on Jacobsen and Truax' criteria (1991), a Reliable Change Index (RCI) was calculated for RCADS-C in order to examine clinically significant change. Based on a community sample of 524 Danish children (unpublished data) an RCI of 9.7 was calculated. From pretreatment to posttreatment 31 (70%) children had clinically significant improvements, and from pretreatment to follow-up 34 (77%) children had improved.

4. Discussion

The attrition rate during treatment in the current study was low (2.3%), suggesting that the treatment was acceptable to participating children and parents. This is comparable to findings of drop-out rates in CBT (e.g., 4.3% in the CAMS study; Piacentini et al., 2014). We also found that MCT-c was highly effective with 86% of the children being free of their primary disorder and 72% being free of all anxiety diagnoses at posttreatment. As we have no matched control group in this open trial, we turn to results from a recent meta-analysis on the effect of different types of CBT on anxiety in children. James et al. (2013) reported that 59% of children were free of all anxiety disorders following different types of CBT programs. Although conclusions drawn on direct comparisons between these findings can only be tentative, our results suggest that MCT-c may be promising. This suggestion is supported by the self-reported effect sizes on changes in anxiety symptoms following treatment, where we found an effect size of 1.20. Comparatively, Ishikawa et al. (2007) found the mean effect size for different types of CBT to be 0.74 with a 95% confidence interval of 0.60–0.82. This may indicate that MCT-c could be a more effective treatment for children with GAD as it is tailored to their difficulties to a higher degree than generic CBT for anxiety disorders. The effects of MCT-c were furthermore upheld by six months follow-up where the children's self-reported effect size was 1.26.

At 6-months follow-up, intent-to-treat analyses revealed that 75% were free of their primary disorder, and 66% were free of all anxiety

disorders. Although face-value suggests a tendency for relapse, the difference was non-significant. None-the-less, these differences lead us to reflect upon how to ensure that treatment gains are maintained long-term. Although research does not suggest an added effect of involving parents in CBT treatment (Breinholst, Esbjørn, Reinholdt-Dunne, & Stallard, 2012), our clinical experience from conducting the treatments suggests that one area of improvement may be further involvement of parents in the treatment. Some parents struggled with understanding the techniques, especially how to assist their child in conducting detached mindfulness. Inviting parents to participate at a greater level would allow us to teach parents how to apply the techniques appropriately, which may ensure continuous correct practice following treatment termination. This suggestion is supported by recent findings by Manassis et al. (2014), which highlight that transfer of control from therapist to parents may play a key role in maintaining treatment effects in the long term.

Children who participated in MCT-c also reported a significant large reduction in the mean level of maladaptive metacognitions, as would be expected. Given that maladaptive metacognitive beliefs are a primary target in MCT and thus challenged in several sessions, this finding is not surprising and is in line with findings from the adult literature (e.g., van der Heiden et al., 2012).

4.1. Strengths and limitations

This study is not without limitations. First, our study is an open trial, and the sample size is limited. Therefore, conclusions regarding the efficacy of MCT-c for GAD can only be preliminary. However, as studies have yet to demonstrate the applicability of MCT in child samples, our study is an important first step towards conducting randomized controlled trials of MCT-c compared to waitlist or active treatment controls. We must, however, highlight that the reported effects were found for children with GAD and they may as such be restricted to this group. Further studies will be needed before any conclusions can be drawn regarding the effect of MCT-c on other types of anxiety disorders. Second, our therapists were not certified MCT specialists. They did, however, receive ongoing supervision from a specialist in MCT. This suggests that the effect found in our study may have been further improved, had therapists been certified MCT specialists. Finally, as parents self-referred their child for treatment, it is possible that the sample was biased and consisted of families with more resources than average. Future studies may wish to examine the influence of demographic variables on therapeutic gains. However, it is worth noting that 50% of the families had received some form of psychological counseling or therapy for their child's anxiety prior to attending MCT-c. This may be a suggestive indication that MCT-c is applicable for children who are non-responsive to other types of interventions.

5. Conclusion

Conclusively, our results indicate that MCT-c is a new promising treatment for children with GAD. Further randomised controlled trials between MCT-c and CBT for children with generalised anxiety disorder are encouraged. Our findings also suggest that the possible implementation of MCT-c for other types of emotional disorders, e.g.,

other anxiety disorders, OCD, and depression, should be explored.

Acknowledgements

The study was supported by grants to the Copenhagen Child Anxiety Project from the Tryg Foundation, grant number: 7-12-0702, Sygekassernes Helse Foundation, grant number: 2011A613 and Augustinus Foundation, grant number: 12-01-019. We also wish to thank all participating children and parents for contributing to this study as well as all staff and psychology students who have assisted in the process.

References

- American Psychiatric Association (1994). *Washington. Diagnostic and statistical manual of mental disorders*. American Psychiatric Association.
- American Psychiatric Association (2013). *Washington. Diagnostic and statistical manual of mental disorders (DSM-5)*. DC: American Psychiatric Publishing.
- Bacow, T. L., May, J. E., Brody, L. R., & Pincus, D. B. (2009). Are there specific meta-cognitive processes associated with anxiety disorders in youth? *Psychology Research and Behavior Management*, 3, 81–90. <http://dx.doi.org/10.2147/prbm.s11785>.
- Barahmand, U. (2009). Meta-cognitive profiles in anxiety disorders. *Psychiatry Research*, 169(3), 240–243. <http://dx.doi.org/10.1016/j.psychres.2008.06.029>.
- Breinholst, S., Esbjørn, B. H., Reinholdt-Dunne, M. L., & Stallard, P. (2012). CBT for the treatment of child anxiety disorders: a review of why parental involvement has not enhanced outcomes. *Journal of Anxiety Disorders*, 26(3), 416–424. <http://dx.doi.org/10.1016/j.janxdis.2011.12.014>.
- Cartwright-Hatton, S., & Wells, A. (1997). Beliefs about worry and intrusions: the meta-cognitions questionnaire and its correlates. *Journal of Anxiety Disorders*, 11(3), 279–296. [http://dx.doi.org/10.1016/S0887-6185\(97\)00011-X](http://dx.doi.org/10.1016/S0887-6185(97)00011-X).
- Cartwright-Hatton, S., Mather, A., Illingworth, V., Brocki, J., Harrington, R., & Wells, A. (2004). Development and preliminary validation of the meta-cognitions questionnaire—adolescent version. *Journal of Anxiety Disorders*, 18(3), 411–422. [http://dx.doi.org/10.1016/S0887-6185\(02\)00294-3](http://dx.doi.org/10.1016/S0887-6185(02)00294-3).
- Chorpita, B. F., Tracey, S. A., Brown, T. A., Collica, T. J., & Barlow, D. H. (1997). Assessment of worry in children and adolescents: an adaptation of the Penn State Worry Questionnaire. *Behaviour Research and Therapy*, 35(6), 569–581. [http://dx.doi.org/10.1016/S0005-7967\(96\)00116-7](http://dx.doi.org/10.1016/S0005-7967(96)00116-7).
- Chorpita, B. F., Yim, L., Moffitt, C., Umemoto, L. A., & Francis, S. E. (2000). Assessment of symptoms of DSM-IV anxiety and depression in children: a revised child anxiety and depression scale. *Behaviour Research and Therapy*, 38(8), 835–855. [http://dx.doi.org/10.1016/S0005-7967\(99\)00130-8](http://dx.doi.org/10.1016/S0005-7967(99)00130-8).
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*, Vol. 2. Hillsdale, NJ: Lawrence Erlbaum Associates. <http://dx.doi.org/10.4324/9780203771587>.
- Copeland, W. E., Angold, A., Shanahan, L., & Costello, E. J. (2014). Longitudinal patterns of anxiety from childhood to adulthood: the great smoky mountains study. *Journal of the American Academy of Child & Adolescent Psychiatry*, 53(1), 21–33. <http://dx.doi.org/10.1016/j.jaac.2013.09.017>.
- Craske, M. G., Treanor, M. L., Conway, C. C., Zbozinek, T., & Vervliet, B. (2014). Maximizing exposure therapy: an inhibitory learning approach. *Behaviour Research and Therapy*, 58, 10–23.
- Davis, R. N., & Valentiner, D. P. (2000). Does meta-cognitive theory enhance our understanding of pathological worry and anxiety? *Personality and Individual Differences*, 29(3), 513–526. [http://dx.doi.org/10.1016/S0191-8869\(99\)00211-1](http://dx.doi.org/10.1016/S0191-8869(99)00211-1).
- Ellis, D. M., & Hudson, J. L. (2010). The metacognitive model of generalized anxiety disorder in children and adolescents. *Clinical Child and Family Psychology Review*, 13(2), 151–163. <http://dx.doi.org/10.1007/s10567-010-0065-0>.
- Esbjørn, B. H., Sømshovd, M. J., Turnstedt, C., & Reinholdt-Dunne, M. L. (2012). Assessing the revised child anxiety and depression scale (RCADS) in a national sample of Danish youth aged 8–16 years. *PUBLIC LIBRARY OF SCIENCE*, 7(5), e37339. <http://dx.doi.org/10.1371/journal.pone.0037339>.
- Esbjørn, B. H., Lønfeldt, N. N., Nielsen, S. K., Reinholdt-Dunne, M. L., Sømshovd, M. J., & Cartwright-Hatton, S. (2015). Meta-worry, worry, and anxiety in children and adolescents: relationships and interactions. *Journal of Clinical Child & Adolescent Psychology*, 44(1), 145–156. <http://dx.doi.org/10.1080/15374416.2013.873980>.
- Esbjørn, B. H., Normann, N., & Reinholdt-Dunne, M. L. (2015). Adapting metacognitive therapy to children with generalised anxiety disorder: suggestions for a manual. *Journal of Contemporary Psychotherapy*, 45(3), 159–166. <http://dx.doi.org/10.1007/s10879-015-9294-3>.
- Esbjørn, B. H., Reinholdt-Dunne, M. L., Caspersen, I. D., Christensen, L. B., & Chorpita, B. F. (2013). Penn state worry questionnaire: findings from normative and clinical samples in Denmark. *Journal of Psychopathology and Behavioral Assessment*, 35(1), 113–122. <http://dx.doi.org/10.1007/s10862-012-9320-7>.
- Esbjørn, B. H., Sømshovd, M. J., Holm, J. M., Lønfeldt, N. N., Bender, P. K., Nielsen, S. K., & Reinholdt-Dunne, M. L. (2013). A structural assessment of the 30-item Metacognitions Questionnaire for Children and its relations to anxiety symptoms. *Psychological Assessment*, 25(4), 1211. <http://dx.doi.org/10.1037/a0033793>.
- Flavell, J. H., Green, F. L., & Flavell, E. R. (2000). Development of children's awareness of their own thoughts. *Journal of Cognition and Development*, 1(1), 97–112. http://dx.doi.org/10.1207/S15327647JCD0101N_10.
- Flavell, J. H. (1979). Metacognition and cognitive monitoring. *American Psychologist*, 34(10), 906–911. <http://dx.doi.org/10.1037/0003-066x.34.10.906>.
- Gregory, A. M., Caspi, A., Moffitt, T. E., Koenen, K., Eley, T. C., & Poulton, R. (2007). Juvenile mental health histories of adults with anxiety disorders. *American Journal of Psychiatry*, 164(2), 301–308. <http://dx.doi.org/10.1176/appi.ajp.164.2.301>.
- Ishikawa, S., Okajima, I., Matsuoka, H., & Sakano, Y. (2007). Cognitive behavioural therapy for anxiety disorders in children and adolescents: a meta-analysis. *Child and Adolescent Mental Health*, 12(4), 164–172. <http://dx.doi.org/10.1111/j.1475-3588.2006.00433.x>.
- Jacobson, N. S., & Truax, P. (1991). Clinical significance: a statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology*, 59(1), 12. <http://dx.doi.org/10.1037//0022-006x.59.1.12>.
- James, A. C., James, G., Cowdrey, F. A., Soler, A., & Choke, A. (2013). Cognitive behavioural therapy for anxiety disorders in children and adolescents. *Cochrane Database of Systematic Reviews*, 6. <http://dx.doi.org/10.1002/14651858.cd004690.pub3>.
- Kvistedal, D. J. T. (2011). *A randomized controlled trial of metacognitive therapy vs. cognitive behavioral therapy vs. waiting list in the treatment of adults with generalized anxiety disorder: a preliminary analysis*.
- Lynneham, H. J., Abbott, M. J., & Rapee, R. M. (2007). Interrater reliability of the anxiety disorders interview schedule for DSM-IV: child and parent version. *Journal of the American Academy of Child & Adolescent Psychiatry*, 46(6), 731–736. <http://dx.doi.org/10.1097/chi.0b013e3180465a09>.
- Manassis, K., Lee, T. C., Bennett, K., Zhao, X. Y., Mendlowitz, S., Duda, S., et al. (2014). Types of parental involvement in CBT with anxious youth: a preliminary meta-analysis. *Journal of Consulting and Clinical Psychology*, 82(6), 1163–1172. <http://dx.doi.org/10.1037/a0036969>.
- NICE (2012). *Generalised anxiety disorder in adults: evidence update*. National Institute for Health and Clinical Excellence 2012.
- Normann, N., van Emmerik, A. A., & Morina, N. (2014). The efficacy of metacognitive therapy for anxiety and depression: a meta-analytic review. *Depression and Anxiety*, 31(5), 402–411. <http://dx.doi.org/10.1002/da.22273>.
- Piacentini, J., Bennett, S., Compton, S. N., Kendall, P. C., Birmaher, B., Albano, A. M., Walkup, J., et al. (2014). 24- and 36-week outcomes for the child/adolescent anxiety multimodal study (CAMS). *Journal of the American Academy of Child & Adolescent Psychiatry*, 53(3), 297–310. <http://dx.doi.org/10.1016/j.jaac.2013.11.010>.
- Pillow, B. H. (2008). Development of children's understanding of cognitive activities. *Journal of Genetic Psychology*, 169(4), 297–321. <http://dx.doi.org/10.3200/gntp.169.4.297-321>.
- Rees, C., & van Koesveld, K. (2008). An open trial of group metacognitive therapy for obsessive-compulsive disorder. *Journal of Behavior Therapy and Experimental Psychiatry*, 39(4), 451–458. <http://dx.doi.org/10.1016/j.jbtep.2007.11.004>.
- Ruscio, A. M., & Borkovec, T. D. (2004). Experience and appraisal of worry among high worriers with and without generalized anxiety disorder. *Behaviour Research and Therapy*, 42(12), 1469–1482. <http://dx.doi.org/10.1016/j.brat.2003.10.007>.
- Silverman, W. K., & Albano, A. M. (1996). *The anxiety disorders interview schedule for children for DSM-IV: child and parent versions*. San Antonio, TX: Psychological Corporation.
- Silverman, W. K., Saavedra, L. M., Pina, A. A., et al. (2001). Test-retest reliability of anxiety symptoms and diagnoses with the Anxiety Disorders Interview Schedule for DSM-IV: child and parent versions. *Journal of the American Academy of Child & Adolescent Psychiatry*, 40(8), 937–944. <http://dx.doi.org/10.1097/00004583-200108000-00016>.
- Simons, M., Schneider, S., & Herpertz-Dahlmann, B. (2006). Metacognitive therapy versus exposure and response prevention for pediatric obsessive-compulsive disorder. A case series with randomized allocation. *Psychotherapy and Psychosomatics*, 75(4), 257–264. <http://dx.doi.org/10.1159/000092897>.
- Smith, K. E., & Hudson, J. L. (2013). Metacognitive beliefs and processes in clinical anxiety in children. *Journal of Clinical Child & Adolescent Psychology*, 42(5), 590–602. <http://dx.doi.org/10.1080/15374416.2012.755925>.
- Spada, M. M., Mohiyeddini, C., & Wells, A. (2008). Measuring metacognitions associated with emotional distress: factor structure and predictive validity of the Metacognitions Questionnaire 30. *Personality and Individual Differences*, 45(3), 238–242. <http://dx.doi.org/10.1016/j.paid.2008.04.005>.
- Spada, M. M., Caselli, G., Manfredi, C., Rebecchi, D., Rovetto, F., Ruggiero, G. M., Sassaroli, S., et al. (2012). Parental overprotection and metacognitions as predictors of worry and anxiety. *Behavioural and Cognitive Psychotherapy*, 40(3), 287–296. <http://dx.doi.org/10.1017/S135246581100021X>.
- Wechsler, D., et al. (1991). *WISC-III: Wechsler intelligence scale for children*. San Antonio, TX: Psychological Corporation.
- Wechsler, D. (2010). *WISC-IV. dansk version. Vejledning Del I*. NCS Pearson, Inc.
- Wells, A., & Carter, K. (2001). Further tests of a cognitive model of generalized anxiety disorder: metacognitions and worry in GAD, panic disorder, social phobia, depression, and nonpatients. *Behavior Therapy*, 32(1), 85–102. [http://dx.doi.org/10.1016/S0005-7894\(01\)80045-9](http://dx.doi.org/10.1016/S0005-7894(01)80045-9).
- Wells, A., & Colbear, J. S. (2012). Treating posttraumatic stress disorder with metacognitive therapy: a preliminary controlled trial. *Journal of Clinical Psychology*, 68(4), 373–381. <http://dx.doi.org/10.1002/jclp.20871>.
- Wells, A. (1995). Meta-cognition and worry: a cognitive model of generalized anxiety disorder. *Behavioural and Cognitive Psychotherapy*, 23(3), 301–320. <http://dx.doi.org/10.1017/S1352465800015897>.
- Wells, A. (2009). *Metacognitive therapy for anxiety and depression*. New York/London: Guilford Press.
- Wood, J. J., Piacentini, J. C., Bergman, R. L., McCracken, J., & Barrios, V. (2002). Concurrent validity of the anxiety disorders section of the anxiety disorders interview schedule for DSM-IV: child and parent versions. *Journal of Clinical Child and Adolescent Psychology*, 31(3), 335–342. http://dx.doi.org/10.1207/s15374424jccp3103_05.
- van der Heiden, C., Muris, P., & van der Molen, H. T. (2012). Randomized controlled trial on the effectiveness of metacognitive therapy and intolerance-of-uncertainty therapy for generalized anxiety disorder. *Behaviour Research and Therapy*, 50(2), 100–109. <http://dx.doi.org/10.1016/j.brat.2011.12.005>.