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No differences between group versus individual treatment of childhood anxiety disorders in a randomised clinical trial

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Background: The present study compares an individual versus a group format in the delivery of manualised cognitive-behavioural therapy (FRIENDS) for children with anxiety disorders. Clinically referred children (aged 8 to 12) diagnosed with Separation Anxiety Disorder ($n = 52$), Generalised Anxiety Disorder ($n = 37$), Social Phobia ($n = 22$) or Specific Phobia ($n = 16$) were randomly assigned to individual ($n = 65$) or group ($n = 62$) treatment. **Method:** Analyses were conducted separately for the intent-to-treat sample and the sample of children who completed treatment. Analyses included chi-square comparisons and regression analyses with treatment format as a predictor. **Results:** Forty-eight percent of the children in the individual versus 41% in the group treatment were free of any anxiety disorder at post-treatment; 62% versus 54% were free of their primary anxiety disorder. Regression analyses showed no significant difference in outcome between individual and group treatment. **Conclusions:** Children improved in both conditions. Choice between treatments could be based on pragmatic considerations such as therapeutic resources, referral rates, and the preference of the parents and the child. **Keywords:** Childhood anxiety disorders, cognitive-behaviour therapy, randomised clinical trial, internalising disorder, intervention. **Abbreviations:** CBT: cognitive-behavioural treatment; ICBT: individual cognitive-behavioural treatment; GCBT: group cognitive-behavioural treatment; CAD: childhood anxiety disorder(s); ITT: intent to treat; TC: treatment completers.

Since the first randomised clinical trial (RCT) evaluating cognitive-behavioural therapy (CBT) for childhood anxiety disorders (CAD) in 1994 was conducted, over twenty RCTs have been carried out (Cartwright-Hatton, Roberts, Chitsabesan, Fothergill, & Harrington, 2004; Kendall, 1994). These RCTs accord CBT the status of an empirically supported treatment. Nonetheless, 20–60% of the children in research trials for CAD still do not show an adequate response. Furthermore, we still know little about the comparative efficacy of alternative treatments to traditional individual CBT for CAD (Cartwright-Hatton et al., 2004). One of the factors that might influence the treatment outcome is the format in which the treatment is delivered.

Competing rationales for group versus individual treatment

There are various arguments for evaluating the efficacy of providing treatment in a group or an individual format. On a conceptual level, group treatment (GCBT) could function as a source of reinforcement, normalisation, (peer) modelling and helping behaviour. Arguments to offer treatment in a group setting concern a closer representation of daily life experience in the group format, exposure to social situations (Manassis et al., 2002) or practical reasoning, i.e. cost-effectiveness (Flannery-Schroeder, Choudhury, & Kendall, 2005; Silverman et al., 1999). In contrast, individual treatment (ICBT) is considered time-consuming and costly. Empirical support for this assumption to date is lacking, however. Though the findings of a recent meta-analysis suggested that GCBT is less cost-effective in the treatment of adult anxiety, the authors emphasised that the evidence is not solid yet (Tucker & Oei, 2007). It can also be argued that ICBT may be more efficacious than GCBT. For example, the presence of other children may interfere with the development of the therapist–child relationship or create a context for negative peer modelling to occur (Silverman et al., 1999). Furthermore, children may actually have more opportunity for avoidance in a group. A disadvantage of GCBT is the need for enough referrals before treatment can start; this might lead to a longer wait between assessment and treatment than for ICBT. Both individual and group therapy seem to offer advantages and disadvantages. Empirical evidence for the choice between individual and group format is scarce and subject to several limitations.

Research on group versus individual therapy

Though several researchers tested individual CBT and group CBT separately (Kendall, 1994; Silverman

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et al., 1999), there is scarce evidence for the supremacy of ICBT over GCBT or vice versa. To date, three randomised controlled trials for CAD compared ICBT with GCBT. Flannery-Schroeder and Kendall (2000) assigned a clinically referred sample of 8–14-year-old children to one of three treatment conditions: GCBT ($n = 12$), ICBT ($n = 13$) and wait-list (WL, $n = 12$). This study did not reveal significant differences in treatment outcome (diagnostic status, self-reported anxiety and parent-reported internalising problems) between ICBT and GCBT, though both conditions were superior to the WL control condition. The results showed that 43% of the children in the ICBT and 46% of the children in the GCBT no longer met criteria for any of the three primary anxiety disorders (generalised anxiety disorder (GAD), separation anxiety disorder (SAD), social phobia (SOP)). A serious limitation of this study was the restricted number of participants per group.

Muris et al. (2001) studied ICBT ($n = 17$) versus GCBT ($n = 19$) with 36 children aged 8–13 years from a school-based sample who scored in the top 10% on the Dutch SCARED-R (Screen for Anxiety Related Emotional Disorders; Birmaher et al., 1997; Muris, Mayer, Bartelds, Tierney, & Bogie, 2001) and met DSM criteria for an anxiety disorder. No significant interaction of the intervention and the treatment format was found. This study also had a small sample size and no data were available on post-treatment diagnostic status.

Manassis and colleagues (2002) conducted a similar study with a larger sample size of children aged 8–12 years ($N = 78$, 41 ICBT; 37 GCBT). Again, the results revealed no main effects for treatment modality, with the exception of the C-GAS, which revealed greater change with ICBT in post hoc analysis. The authors explored their data further by dichotomising the sample in groups with high and low social anxiety and hypothesised that children with high social anxiety would respond preferentially to GCBT since this format may offer additional exposure. The authors report a significant reduction in social anxiety in both conditions and conclude from their study that children with higher rates of social anxiety benefited more from ICBT. However, they did not report the time by treatment interaction that would be directly relevant to this question. Furthermore, only 5 of the 78 participants (6.4%) were actually diagnosed with SOP as a primary diagnosis; post-treatment diagnostic status was not assessed. Thus, the analyses provided on this study do not provide convincing support as to whether children with SOP benefit more from ICBT than GCBT.

In conclusion, though all three studies comparing ICBT and GCBT are laudable for addressing an issue with clinical and public policy implications, they suffer from various methodological limitations that preclude resolution of the question whether GCBT is more effective than ICBT. Two studies were underpowered to detect differences between groups and a third with a larger sample did not report a main effect for treatment format or the required treatment × time interaction. Two studies did not report on post-treatment diagnostic status limiting thereby the clinical interpretation, and one study used a school-based sample instead of a clinically referred sample.

The present study

The present study compared ICBT and GCBT with a large, clinically referred sample of children with anxiety disorders. Children with a primary diagnosis of SAD, GAD, SP or SOP were randomly selected and assigned to standardised ICBT or GCBT. First, post-treatment diagnostic status and effect-sizes were compared for both ICBT and GCBT. Second, treatment format was studied as a predictor of outcome by means of regression analyses. The absence or presence of SOP, age, and gender were included in the regression analyses to study if these variables add to the prediction of treatment outcome. Significant improvement was expected for both treatment formats. The present study is part of a larger study on a stepped-care model investigating the effect of an additional treatment protocol for non-responders to a traditional CBT programme. Follow-up data would be biased by this additional treatment and are therefore not available.

Method

Participants

Eligible for participation were children aged 8–12 years referred to the anxiety and depression outpatient clinic for Child and Adolescent Psychiatry Department, Leiden University Medical Centre and Erasmus Medical Centre, Sophia Children's Hospital in Rotterdam, in the Netherlands, and diagnosed with SAD, GAD, SOP or SP. Exclusion criteria were an IQ below 85, poor command of the Dutch language, pervasive developmental disorder, selective mutism, schizophrenia or other psychotic disorder. Children with obsessive compulsive disorder, posttraumatic stress disorder and panic disorder were excluded because at that time there was no empirical evidence that children would benefit more from CBT compared to medical or combined treatment. All children and their parents were interviewed with the Anxiety Disorders Interview Schedule for DSM-IV (ADIS-C/P; Silverman & Albano, 1996). Children with comorbid conditions such as depression ($n = 2$), dysthymia ($n = 7$), ADHD ($n = 13$) or ODD ($n = 7$) were not excluded from the study. Comorbidity is a common problem presented in general practice, and exclusion of children with comorbid conditions would therefore complicate generalisation of the findings to the general practice. The Committees for Medical Ethics of Leiden University Medical Centre and of Sophia Children's Hospital/Erasmus Medical Centre approved the conduct of this research.

A total of 142 children and their parents were asked to participate in the present study and 133 subjects gave informed consent to participate. Children on medication for an anxiety disorder were withdrawn from medication, if possible, or otherwise excluded. For five children with ADHD, the dosage of medication was kept constant during the study as a constant dosage of medication for ADHD was considered unlikely to confound treatment effects.

Participants were randomly assigned in sequences of 6 to either GCBT or ICBT. Six children were excluded from the randomisation because they refused assignment to group treatment ($n = 2$) or were absent at the start of the group ($n = 1$). Owing to their location three children were treated at an affiliated outpatient clinic near their home. This resulted in a sample of 127 children, the intent-to-treat (ITT) sample. Sixty-five children participated in the GCBT, and 62 children were given ICBT. Demographic data are presented in Table 1.

All children had Dutch nationality; six children had double nationality (5%), which is somewhat less than the general population (expected 11%). The social economic status (SES) was low for 19 children, medium for 59 children and high for 49 children (Central Bureau of Statistics Netherlands, 2001). There were no significant pretreatment differences between ICBT and GCBT or between the two sites with regard to SES, age, gender or diagnosis. To control for pre-treatment differences, children participating in the ICBT and GCBT conditions were compared with respect to the CBCL-Int of mother and father, the Multidimensional Anxiety Scale for Children (MASC) and the Children's Depression Inventory (CDI).

Thirteen children were living in a single-parent household, 108 children were living in a two-parent (biological) household, five children were living in a two-parent household with one biological and one step-parent and one child was raised by adoptive parents. For children living in a two-parent household, both parents were asked to participate. This resulted in the participation of 126 mothers and 108 fathers. Two fathers and one mother died; of the remaining 17 fathers that did not participate, 13 did not maintain contact with their children or the fathers were unknown, three fathers refused to participate in the research project and one father lacked proficiency in Dutch. The primary diagnoses of the children were SAD ($n = 52$), GAD ($n = 37$), SOP ($n = 22$) or SP ($n = 16$). Comorbidity rates in the samples are presented in Table 1.

Eight children dropped out of treatment (ICBT: $n = 5$, GCBT: $n = 3$), which resulted in a sample of 119 treatment completers (TC). All results are based on the sample of children who started treatment (intent-to-treat; ITT) unless otherwise specified.

Table 1 Demographic data on participants (*n*) for ICBT and GCBT

Variable	Individual ($n = 65$)		Group ($n = 62$)		ICBT vs. GCBT t/χ^{2a} (df)
	Boys	Girls	Boys	Girls	
Child gender	35	30	36	26	.23 (1)
age (years)	10.13	10.08	9.88	10.13	−.44
SD	1.22	1.40	1.09	1.47	
Site: Leiden	14	10	9	8	1.31 (1)
Rotterdam	21	20	27	18	
SES: Low	7	1	6	4	.89 (2)
Middle	15	14	20	10	
High	13	15	10	12	
Diagnosis					1.11 (3)
SAD	17	10	16	9	
GAD	11	10	8	8	
SP	3	4	5	4	
SOP	4	6	7	5	
Comorbidity					
No comorbid disorders	13	15	14	13	
One anxiety disorder	10	9	14	7	.40[b]
Two or more anxiety disorders	6	3	7	3	
Depression	1	0	1	0	–[c]
Dysthymia	2	4	0	1	–[c]
AD(H)D	7	1	3	2	.53
ODD	2	2	2	1	–[c]

Note.[a]= all *t*-tests and chi-square tests were nonsignificant ($p > .05$). [b]= the number of diagnoses used, defined as 1, 2, or 3 or more (anxiety) disorders. [c]= 25% or more of cells had an expected count of 5 or less. AD = anxiety disorder(s).

Procedure

Children and parents were interviewed with the ADIS-C/P and further assessed with the routine assessment procedure to confirm clinical diagnosis of the child. The routine procedure included at both sites at least one psychiatric consultation, intelligence testing, and assessment of school and family functioning. Symptoms of anxiety and depression were assessed with the MASC (March, 1997) and the CDI (Kovacs, 1992).

After the initial routine assessment verbal and written consent were obtained from the parents as well as children above age 12. After verbal and written consent were obtained, children were randomly assigned to ICBT or GCBT. Families that were willing to participate were told which format they would receive. Groups started preferably with six children (eight groups); however, three groups had fewer than six children due to a long period with few referrals in which it was decided to begin with five children, absence during the first sessions of the group and withdrawal of participation. All children participating received a manual-based 10-session weekly CBT programme and their parents received 4 sessions of CBT parent training (FRIENDS; Barrett & Turner, 2000). One-week post-treatment children and parents were interviewed with the ADIS-C/P and post-treatment measures were administered to both children and parents.

An a priori power analysis showed that the needed sample size was 52 to detect large effects and 128 to detect medium effects. Estimation of the necessary sample size was based on a two-tailed *t*-test for means with expected effect-sizes of .50 (medium) and .80 (large), an alpha of .05, and power of .80.

Measures

Diagnostic interview. The ADIS-C/P is a semi-structured interview schedule and was administered to both

parents and children pre- and post-treatment to obtain clinical information and derive DSM-IV diagnoses. The ADIS is a reliable instrument organised according to DSM-IV criteria and yields kappa coefficients for SAD, SOP, SP and GAD ranging from .62 to .92 for both the child and the parent interview (Silverman & Ollendick, 2005; Silverman, Saavedra, & Pina, 2001). The Dutch translation of the ADIS (Siebelink & Treffers, 2001) was made in close consultation with Silverman. Reliability research into the Dutch version of the ADIS is not available, so interviewers were instructed according to the standard procedure; we thus relied on the psychometric properties reported in the literature.

Experienced clinicians or master-level students administered the ADIS-C/P pretreatment. Clinicians of both institutions met several times to ensure that the procedures and decision making were alike. The first and fifth authors and master-level students conducted the post-treatment assessments. Interviewers were not blind to treatment assignment (individual or group treatment), but had no interest in the supremacy of one condition over the other. Master-level students were trained by observing live and videotaped interviews and completed an exam to prove acceptable administration of the interview. The authors reviewed, supervised and discussed the interview reports of the students during the conduct of the research project to ensure that administration, scoring and reporting would not drift.

Self-report measures. Information on self-reported child anxiety and depressive symptoms was obtained by administering the Dutch versions of the MASC and CDI. The MASC is a general measure of anxiety and includes 39 items. The psychometric properties of the American version are good (March, Parker, Sullivan, Stallings, & Conners, 1997). The MASC was translated into Dutch by Utens and Ferdinand (2000); preliminary analyses revealed an excellent Cronbach's alpha of .93 for the total score ($N = 299$, age 8–12) and a test–retest correlation of .81 ($n = 196$, age 8–12).

The CDI is a 27-item scale suited for monitoring changes in a child's mood (Kovacs, 1992). A Dutch version of the CDI was used as a continuous measure of depressed mood (Koot & van Widenfelt, 2000) in the present study. The original English CDI has good internal consistency (alphas ranging from .71 to .89) and acceptable test–retest reliability (correlation of .75). The Dutch translation showed good psychometric properties; the Cronbach's alpha was .82 for the total score ($N = 649$, age 8–12).

Parent-report measures. The Child Behavior Checklist (CBCL) is a well-known and researched 113-item scale that assesses child behaviour problems by parents and has shown good reliability and validity (Achenbach & Rescorla, 2001). Cronbach's alpha of the internalising scale for the clinical population in the present study ranged from .84 for mothers to .85 for fathers.

Treatment

Children were treated with the Dutch translation of the FRIENDS programme (Barrett & Turner, 2000; Utens, de Nijs, & Ferdinand, 2001). Results from previous research indicated that FRIENDS is an effective treatment for childhood anxiety disorders (Shortt, Barrett, & Fox, 2001). The FRIENDS program is based on the Coping Cat workbook from Philip Kendall (Kendall, Kane, Howard, & Siqueland, 1990). Therapeutic techniques comprise psychoeducation, relaxation and breathing exercises, exposure, problem-solving skills training, social support training and cognitive restructuring exercises. Parent sessions comprised mainly psychoeducation. Time from start to the end of treatment covered approximately 17 weeks ($M = 16.81$, $SD = 3.35$).

Treatment integrity

Adherence was checked as part of the treatment integrity measures. All therapy sessions were videotaped; a random selection of 30% of the tapes of individual sessions and all tapes of the group sessions were checked for adherence. ICBT sessions were 60 minutes and GCBT sessions were 90 minutes. Master-level students were trained and had to obtain satisfactory interrater reliability before independent scoring could be conducted. Yule's Y was used as a measure for calculating interrater concordance, as Yule's Y is less sensitive to skewed distributions. The interpretation of Y is similar to kappa; values above .55 were considered acceptable and had to be obtained before independent scoring could commence. The Y scores at the start of independent scoring ranged from .55 to .73 ($n = 5$, $M = .68$, $SD = .08$). Weekly meetings were held to discuss scoring and prevent observer drift. Results indicated that therapists adhered sufficiently to the treatment protocol (94% of the child sessions and 85% of the parent sessions were provided as intended). There were no differences in adherence in the child sessions between children who did and who did not meet diagnostic criteria at post-treatment (free of any anxiety disorder at post-treatment ($t(121) = 1.03$, $p = \text{ns}$)). Adherence of the child-sessions was not different between ICBT and GCBT ($t(121) = .97$, $p = \text{ns}$). Adherence in the parent sessions was not different for children who did and did not meet diagnostic criteria at post-treatment ($t(119) = .84$, $p = \text{ns}$), but did show a difference between ICBT and GCBT ($t(120) = -2.37$, $p < .05$) with higher rates of adherence in the group setting. Comparison of four groups representing treatment success and failure, and post-treatment diagnostic status did not reveal any differences ($F(3, 117) = 2.41$, $p = \text{ns}$).

Twenty-two therapists conducted the therapy sessions; five were doctoral students and 17 were licensed psychologists. Forty-one children were treated at Curium-LUMC by 9 therapists; 86 children were treated at the Sophia-Erasmus MC by 13 therapists. Therapists at each institute met weekly to discuss the treatment and were supervised by two experienced licensed cognitive-behavioural therapists. Every three to four months the therapists of the two institutions met to prevent therapist drift between institutions. There were no differences in treatment outcome between the two sites (primary diagnosis absent: χ^2 (1, = 124) = 1.58, p =ns), free of any anxiety disorder at post-treatment (χ^2 (1, = 124) = 2.09, $p = \text{ns}$).

Statistical analyses

To investigate if treatment format contributes to variation in the treatment outcome, regression analyses were conducted with the post-treatment level of anxiety (MASC), depression (CDI) and internalising problem behaviour (CBCL-Int) as dependent variables. To correct for pretreatment levels of the MASC, CDI and CBCL-Int, pretreatment scores on these variables were entered as predictor variables. Data were input to obtain multiple imputed datasets ($m = 5$) since missing values pose a challenge to the interpretation of intent-to-treat analysis (Nich & Carroll, 2002). There are several methods to cope with missing values in clinical trials; multiple imputation methods are advised to obtain results closest to the 'true' model (Mazumdar, Liu, Houck, & Reynolds, 1999). Missing values did not exceed 5%, with the exception of the CBCL for fathers for which 8% of the values were missing.

Results

Primary analyses

In the GCBT, 41% of the participants no longer met criteria for any anxiety disorder (responders); 54% no longer met the criteria for their primary disorder. In the ICBT, 48% of the participants no longer met criteria for any anxiety disorder (responders); 62% no longer met the criteria for their primary disorder. The treatment response was not significantly different between the two treatment conditions for the absence of the primary diagnosis (χ^2 (1, = 124) =.78, $p = .38$) and for the absence of any anxiety disorder (χ^2 (1, = 124) = .55, $p = .46$) at post-treatment. The results for the treatment completers were not significantly different between the two treatment conditions (absence of the primary disorder ICBT 63% vs. GCBT 53%; χ^2 (1, = 119) = 1.42, $p = .23$, and free of any anxiety disorder ICBT 48% vs. GCBT 40%; χ^2 (1, = 119) = 1.06, $p = .30$).

Effect-sizes were calculated separately for the individual and group formats based on intent-to-treat; the confidence intervals indicate that there is no significant difference for ICBT and GCBT on the MASC (ICBT: $d = .73$, 95% CI .65–1.43; GCBT: $d = .81$, 95% CI .74–1.55) and the CDI (ICBT: $d = .68$, 95% CI .59–1.35; GCBT: $d = .78$, 95% CI .69–1.49). Effect-sizes based on the CBCL-Int appeared similar in both conditions (mothers: ICBT: $d = .53$, 95% CI .38–1.12; GCBT: $d = .56$, 95% CI .42–1.18; fathers: ICBT: $d = .32$, 95% CI .08–.85, GCBT: $d = .42$, 95% CI .20–1.00). The means and standard deviations for the main outcome measures (MASC, CDI and CBCL) are presented in Table 2 for the ITT-sample and the TC-sample.

Secondary analyses

Pretreatment anxiety accounted for 31% of the variance in post-treatment self-reported anxiety ($p < .01$). Treatment format (ICBT versus GCBT) did not account for any variation in the treatment outcome (see Table 3). The pre-treatment levels of the CDI and the CBCL-Int accounted for 30% of the variance in outcome of self-reported depression; 39% of mothers and 45% of fathers reported internalising problem behaviour. Treatment format did not predict treatment outcome in any of the analyses.

Interaction effects for the presence or absence of SOP and treatment format revealed an interaction effect for internalising symptoms as reported by fathers ($\beta = .25$, $p < .05$, R-Squared change = .03, $p < .05$), suggesting that children with SOP benefit more in the GCBT condition whereas in the ICBT children without SOP tend to benefit more. However, the R-Squared change was very modest and this result was found only in the TC-sample and not in the ITT-sample (mean $\beta = .20$, ns). Moreover, there was no interaction effect for the absence or presence of SOP on the MASC, CDI and CBCL-Int of mothers.

Table 2 Means (standard deviations) for time × treatment condition (GCBT vs. ICBT)

	Pretreatment		Post-treatment	
Measure	(GCBT)	(ICBT)	(GCBT)	(ICBT)
Intent-to-treat				
Child ($N = 127$)				
MASC	51.43 (18.36)	50.85 (18.51)	37.00 (17.37)	36.94 (19.45)
CDI	8.73 (6.38)	10.28 (7.69)	4.68 (4.20)	5.65 (5.85)
Mother ($N = 126$)				
CBCL-Int	21.21 (8.69)	19.40 (9.26)	16.01 (9.80)	14.66 (8.62)
Father ($N = 108$)				
CBCL-Int	16.02 (7.44)	16.38 (8.56)	12.63 (8.64)	13.64 (8.34)
Treatment completers				
Child				
MASC ($115 \leq n \leq 119$)	52.24 (18.06)	50.93 (18.78)	36.70 (17.29)	37.16 (19.26)
CDI ($111 \leq n \leq 118$)	8.87 (6.40)	10.33 (7.81)	4.76 (4.29)	5.50 (5.84)
Mother				
CBCL-Int ($114 \leq n \leq 117$)	21.45 (8.80)	19.13 (9.48)	16.16 (10.20)	14.68 (8.50)
Father				
CBCL-Int ($n = 98$)	15.80 (7.93)	16.26 (8.67)	13.24 (8.74)	14.04 (8.27)

Table 3 Regression analysis

	B (SD B)	SE B (SD SE B)	β (SD β)
Child ($N = 127$)			
Step 1[a]			
Constant	8.57 (1.90)	4.09 (.16)	
MASC-Pre	.56 (.04)	.07 (.00)	.55** (.02)
Step 2			
Constant	8.69 (1.89)	4.26 (.09)	
MASC-Pre	.56 (.04)	.07 (.00)	.55** (.02)
ICBT × GCBT	−.26 (.23)	2.74 (.04)	−.01 (.01)
Step 1[b]			
Constant	1.43 (.24)	.64 (.01)	
CDI-Pre	.39 (.02)	.05 (.00)	.54** (.03)
Step 2			
Constant	1.64 (.26)	.78 (.02)	
CDI-Pre	.39 (.02)	.05 (.00)	.54** (.03)
ICBT × GCBT	−.37 (.10)	.77 (.02)	−.04 (.01)
Mother ($N = 126$)			
Step 1[c]			
Constant	2.30 (.50)	1.58 (.04)	
CBCL-Int	.64 (.02)	.07 (.00)	.63** (.02)
Step 2			
Constant	2.23 (.50)	1.66 (.04)	
CBCL-Int	.64 (.02)	.07 (.00)	.63** (.02)
ICBT × GCBT	.18 (.15)	1.29 (.04)	.01 (.01)
Father ($N = 108$)			
Step 1[d]			
Constant	1.66 (.25)	1.36 (.06)	
CBCL-Int	.71 (.01)	.08 (.00)	.67** (.02)
Step 2			
Constant	1.98 (.23)	1.51 (.08)	
CBCL-Int	.71 (.01)	.08 (.00)	.67** (.02)
ICBT × GCBT	−.61 (.36)	1.21 (.04)	−.04 (.02)

Note. **$p < .001$. [a]$R^2 = .31$ (SD = .03) for Step 1; $\Delta R^2 = .00$ (SD = .00) for Step 2 (p = ns).
[b]$R^2 = .30$ (SD = .03) for Step 1; $\Delta R^2 = .00$ (SD = .00) for Step 2 (p = ns).
[c]$R^2 = .39$ (SD = .03) for Step 1; $\Delta R^2 = .00$ (SD = .00) for Step 2 (p = ns).
[d]$R^2 = .45$ (SD = .03) for Step 1; $\Delta R^2 = .00$ (SD = .00) for Step 2 (p = ns).

Discussion

The main purpose of this study was to investigate CBT outcome for individual versus group format for CAD. In the present study no significant difference was found between ICBT and GCBT. For GCBT 41% of the participants no longer met criteria for any anxiety disorder whereas for ICBT 48% no longer met criteria for any anxiety disorder. Fifty-four percent of the children in the GBCT no longer met the criteria for their primary disorder, whereas in ICBT 62% no longer met the criteria for their primary disorder. Effect-sizes for the ICBT ranged from .32 to .73 and in the GCBT from .42 to .81, which is not different from the effect-sizes as reported in a recent meta-analysis (ICBT: $d = .52$ (95% CI .04–.99), GCBT: $d = .61$ (95% CI .44–.79)) (In-Albon & Schneider, 2007). Furthermore, regression analyses revealed that the absence or presence of SOP in interaction with treatment format did not add to the prediction of treatment outcome. With our larger sample size, we find no significant difference between ICBT and GCBT. Our results are consistent with the three previous studies investigating ICBT versus GCBT despite the fact that the sample sizes in these studies were smaller (Flannery-Schroeder & Kendall, 2000; Manassis et al., 2002; Muris et al., 2001).

So far, treatment outcome and treatment gains were usually investigated in the literature, including our own study in terms of anxiety and depressive symptoms, child behaviour problems and diagnostic status. Treatment of CAD in general could also lead to secondary gains such as improved social skills or improved parental understanding of avoidant strategies. These secondary gains might contribute to generalisation and the long-term maintenance of treatment gains, and could be examined in future research.

Group treatment is repeatedly argued in the literature to offer opportunities to reduce social anxiety and improve social skills in children with SOP. Support for improvement in social skills and reduction of SOP was shown in a social skills CBT-based group training for childhood SOP (Spence, Donovan, & Brechman-Toussaint, 2000). There is some empirical evidence that social skills and social performance improve more with a social effectiveness group therapy for children (SET-C) compared to an active but non-specific group treatment (testbusters) (Beidel, Turner, & Morris, 2000); however, children in both situations showed improvement in social skills and social skill performance. The improvement for the testbuster situation cannot be attributed to the treatment, but it could be a consequence of the group setting. The present study showed an interaction effect for children who completed treatment as reported by fathers on the CBCL and the absence or presence of SOP, suggesting that children with SOP benefit more compared to children without SOP in the GCBT, and children without SOP benefit more in the ICBT compared to children with SOP. However, this effect did not show for the other informants (mothers and children) or for the ITT-sample.

Strengths and limitations

The present study is the first study in the literature that is adequately powered to be able to detect differences between individual and group treatment. The results suggest that the absence or presence of SOP may interact with treatment format. Though the sample size in the present study is quite large, it was designed to investigate main effects and not designed for interaction effects. An adequate test of an interaction requires an even larger sample size than for detecting a simple main effect for treatment. These considerations point to the need for an adequately powered trial testing whether SOP interacts with treatment format. Such a trial would

also benefit from inclusion of a wider range of outcome variables tailored to the hypothesised advantages of group versus individual treatment (e.g., secondary treatment gains such as increase in social skills). Furthermore, we cannot rule out that the similarities in results have been achieved through different processes.

In conducting the present study we had some practical difficulties with the randomisation of children to the individual or group condition. These practical difficulties are similar to clinical cases that would normally present themselves in routine care settings. Our study was limited as, contrary to several other studies (e.g. Kendall, 1994; Silverman et al., 1999), interrater reliabilities were not calculated. Insufficient interrater reliability could have led to type II errors, leading to a belief that there is no effect when in reality there is. However, to ensure that administration, scoring and reporting were conducted in a reliable manner, considerable effort was put into training and supervision of ADIS-interviewers. Furthermore, although ADIS-interviewers were not told the treatment format to which children were allocated, we cannot guarantee that they were blind to the treatment condition.

It should be noted that this study, by design, did not include a wait-list control group. Such a group would have allowed us to examine whether only one of the formats (group or individual) was superior to a control condition, even if they did not differ from each other. Our overriding argument not to include a wait-list control group was that there had been sufficient demonstration that individual CBT was superior to wait-list control (Cartwright-Hatton et al., 2004) that we could no longer assume equipoise and therefore could not ethically offer a wait-list control in a randomised design (Lilford & Jackson, 1995). Furthermore, our main aim in conducting the study was addressing the practical clinical question of whether any superiority could be observed for individual CBT over the assumed more economical group CBT. For this purpose, we did not need the wait-list control.

We conclude that children with anxiety disorders benefit equally from individual and group treatment. We suggest that there is a need for an adequately powered trial testing interaction effects. In such a trial secondary treatment gains should be considered besides the primary treatment gains (i.e., reduction in anxiety symptoms, depressive symptoms). Secondary treatment gains such as improvement in social skills might contribute to the maintenance and generalisation of treatment success.

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