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Long-term effectiveness of cognitive behavioral therapy for youth with anxiety disorders☆

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ABSTRACT

Cognitive behavioral therapy (CBT) has demonstrated favorable long-term outcomes in youth with anxiety disorders in efficacy trials. However, long-term outcomes of CBT delivered in a community setting are uncertain. This study examined the long-term outcomes of individual (ICBT) and group CBT (GCBT) in youth with anxiety disorders treated in community mental health clinics. A total of 139 youth (mean age at assessment 15.5 years, range 11–21 years) with a principal diagnosis of separation anxiety disorder (SAD), social anxiety disorder (SOP), and/or generalized anxiety disorder (GAD) were evaluated, on average, 3.9 years post-treatment (range 2.2–5.9 years). Outcomes included loss of all inclusion anxiety diagnoses, loss of the principal anxiety diagnosis and changes in youth- and parent-rated youth anxiety symptoms. At long-term follow-up, there was loss of all inclusion anxiety diagnoses in 53%, loss of the principal anxiety diagnosis in 63% of participants as well as significant reductions in all anxiety symptom measures. No statistical significant differences in outcome were obtained between ICBT and GCBT. Participants with a principal diagnosis of SOP had lower odds for recovery, compared to those with a principal diagnosis of SAD or GAD. In conclusion, outcomes of CBT for youth anxiety disorders delivered in community mental health clinics were improved at nearly 4 years post-treatment, and recovery rates at long-term follow-up were similar to efficacy trials.

1. Introduction

Cognitive behavioral therapy (CBT) is a well-established treatment for anxiety disorders in children and adolescents (hereafter youth) (Higa-McMillan, Francis, Rith-Najarian, & Chorpita, 2016). Meta-analyses have shown that approximately 60% of youth recover from their anxiety disorders and experience significant symptom reduction following treatment (James, James, Cowdrey, Soler, & Choke, 2013; Warwick et al., 2017). However, there has been less focus on the question of whether treatment outcomes are maintained in the long term. Relapse can lead to detrimental consequences at individual, family, and societal levels, as early anxiety disorders predict later emotional, social, academic, and vocational problems (Copeland, Angold, Shanahan, & Costello, 2014; Kendall & Ollendick, 2004). Successful CBT treatment for youth anxiety disorders on the other hand, provides protection from later sequelae (Puleo, Conner, Benjamin, & Kendall, 2011; Wolk, Kendall, & Beidas, 2015). Furthermore, investigating long-term outcomes is essential in establishing treatment efficacy in youth anxiety disorders (Chambless & Hollon, 1998).

Long-term follow-up is commonly defined as follow-up at least two years post-treatment (Gibby, Casline, & Ginsburg, 2017; Nevo & Manassis, 2009). To date, five studies based on separate samples have

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examined the long-term effects of CBT protocols in youth with mixed anxiety disorders in the form of separation anxiety disorder (SAD), social anxiety disorder (SOP), and/or generalized anxiety disorder (GAD) (Barrett, Duffy, Dadds, & Rapee, 2001; Benjamin, Harrison, Settipani, Brodman, & Kendall, 2013; Ginsburg et al., 2014; Kendall & Southam-Gerow, 1996; Kendall, Safford, Flannery-Schroeder, & Webb, 2004), over follow-up periods ranging from 2 to 19 years post-treatment (M = 7.9 years; Mdn = 6.2 years). These studies indicate that post-treatment outcomes were either maintained or improved at long-term follow-up, with 46.5–85.7% of study participants no longer fulfilling the diagnostic criteria for anxiety disorders (e.g. Barrett et al., 2001; Ginsburg et al., 2014). A recent review of long-term follow-up studies of youth treated for any anxiety disorder (with the exception of obsessive-compulsive disorder and post-traumatic stress disorder), with follow-up assessments a mean of 5.9 years post-treatment, found that 64.6% of youth were in remission. More specifically, 57.0% and 76.7% had lost all inclusion anxiety diagnoses and their primary anxiety diagnosis, respectively (Gibby et al., 2017). In addition, different treatment formats in the form of individual CBT (ICBT) and group CBT (GCBT) in youth with anxiety disorder were examined by Saavedra et al.; the authors found no difference in long-term outcomes between ICBT and GCBT at a mean of 9.8 years post-treatment (Saavedra, Silverman, Morgan-Lopez, & Kurtines, 2010), consistent with previous meta-analyses of studies of short-term outcomes which showed similar effect sizes for both ICBT and GCBT (In-Albon & Schneider, 2006; Silverman, Pina, & Viswesvaran, 2008).

Long-term outcome studies differ considerably in reported outcome measures, e.g., absence of the principal inclusion anxiety diagnosis (Kendall et al., 2004), absence of all inclusion anxiety diagnoses (Barrett et al., 2001), or absence of all anxiety diagnoses (Benjamin et al., 2013). However, loss of one anxiety diagnosis does not necessarily indicate the absence of further anxiety-related impairments. Furthermore, heterogeneity in reported outcomes makes comparisons across long-term follow-up studies difficult and hence challenges the generalizability of the study findings. Consequently, this calls for more detailed information on diagnostic outcomes following treatment, including loss of the principal anxiety diagnosis, all comorbid anxiety diagnoses, as well as symptom measure outcomes (Gibby et al., 2017; Warwick et al., 2017).

All of the above-cited studies are *efficacy* trials conducted at specialized university clinics. Efficacy trials allow for high levels of methodological rigor and control, thus achieving high internal validity. However, to what extent findings from such studies are transferable to community clinical settings is unclear (Hunsley & Lee, 2007; Santucci, Thomassin, Petrovic, & Weisz, 2015). Factors that may influence treatment outcomes differentially in community clinics, compared to university clinics, include differing patient populations (e.g., different inclusion and exclusion criteria, greater population heterogeneity in the community setting), therapist-related factors (e.g., training, caseloads, access to expert supervision), treatment context (e.g., availability of research resources, treatment monitoring) and treatment content (e.g. potential less use of exposure exercises) (Smith et al., 2017). It is argued that these factors contribute to reduced effect sizes of treatment when efficacy-supported therapies are transferred to community clinics (Weisz et al., 2013).

To our knowledge, no study to date has examined the long-term outcomes of CBT for anxiety disorders in community mental health clinics, i.e., the *effectiveness* of long-term treatment. Several short-term effectiveness studies with follow-up assessments 3–15 months post-treatment (M = 9.8 months, Mdn = 9 months) reported recovery rates ranging from 52% to 78% (Barrington, Prior, Richardson, & Allen, 2005; Bodden et al., 2008; Chorpita et al., 2013; Lau, Chan, Li, & Au, 2010; Nauta, Scholing, Emmelkamp, & Minderaa, 2001; Nauta, Scholing, Emmelkamp, & Minderaa, 2003). Overall, the studies confirmed the maintenance of treatment gains from post-treatment to follow-up, albeit with slightly lower recovery rates compared to those obtained from efficacy trials. However, there is a need to examine effectiveness of CBT for mixed anxiety disorders in youth beyond 15 months post-treatment.

It has been argued that the three main anxiety disorders SAD, SOP, and GAD are manifestations of the same underlying anxiety construct and therefore are amenable to treatment with the same CBT protocols (Crawley, Beidas, Benjamin, Martin, & Kendall, 2008; Silverman & Kurtines, 1996). However, recent short-term studies showed that children with SOP had poorer treatment outcomes from generic CBT protocols, compared to those with GAD and/or SAD (Hudson et al., 2015; Reynolds, Wilson, Austin, & Hooper, 2012). Based on an efficacy trial, Kerns, Read, Klugman, and Kendall (2013) reported comparable outcomes for SOP, SAD, and GAD immediately following CBT but found youth with SOP were significantly less improved at 7.4-year follow-up. On the other hand, Barrett et al. (2001) found no evidence that pre-treatment diagnosis, including SOP, differentially affected long-term treatment outcomes. Thus, further studies on the long-term effects of CBT in youth with SOP are warranted.

The primary aim of the present study was to investigate the long-term outcomes of CBT in youth with anxiety disorders treated in community mental health clinics. Based on previous long-term efficacy studies and on short-term effectiveness studies, we expected that outcomes of CBT would be maintained or improved in the community setting, yet below comparative efficacy studies. The secondary aim was to investigate the effects of using different treatment formats (i.e., GCBT versus ICBT) on long-term outcomes. Based on existing evidence, we expected the effects of both treatment formats to be maintained during the follow-up period and to be equivalent at long-term follow-up. The third aim was to assess for disorder-specific differences in treatment outcomes, for which we predicted that outcomes in youth with a principal diagnosis of SOP would be inferior, compared to those with a principal diagnosis of GAD and/or SAD.

2. Method

2.1. Participants

Eligible participants were selected from a total of 179 youth who participated in a randomized controlled trial (RCT) investigating the effectiveness of ICBT and GCBT, compared to a waitlist control, in youth with mixed anxiety disorders treated in community mental health clinics (Wergeland et al., 2014). The study was conducted from 2008 to 2012. Age of participants ranged from 8 to 15 years at the time of recruitment. The inclusion criterion was a principal diagnosis of SAD, SOP, and/or GAD. The only exclusion criterion included pervasive developmental disorder, psychotic disorder, severe conduct disorder, and/or mental retardation. Participants were assessed pre- and post-treatment, and at 1-year follow-up. A detailed description of the original sample, method, and outcomes has been published elsewhere (Wergeland et al., 2014).

A total of 139 youth participated in the present study. Youth were assessed an average of 3.9 years post-treatment (SD = 0.8, range 2–6 years). Age of participants at long-term follow-up ranged from 11 to 21 years (M = 15.5, SD = 2.5), and 54.7% were female. Youth participating in this long-term follow-up study (N = 139) were compared to those from the original RCT not participating in the present study (n = 40) in terms of pre-treatment socio-demographic characteristics (i.e., age, gender, ethnicity, parent occupational status) and pre-treatment clinical variables (i.e., clinical severity rating (CSR) of the principal anxiety diagnosis, anxiety and depressive symptoms, comorbidity, principal anxiety diagnosis present at post-treatment). There were no significant differences on any of these variables between youth participating and those not participating in the long-term follow-up study (see Table 1). Furthermore, no differences were found in post-treatment outcomes (loss of the principal diagnosis and loss of all inclusion anxiety diagnoses, changes in symptom measures) between youth in the

Table 1
Comparison of pre- and post-treatment characteristics of participants and non-participants at long-term follow-up.

	Participants (n = 139)				Non-participants (n = 40)				
	M	(SD)	n	%	M	(SD)	n	%	p
Pre-treatment characteristics									
Gender									0.72
Female			76	54.7			20	50.0	
Age, mean (SD)	11.46	2.11			11.85	2.03			0.16
Age group (years)									0.45
8–12			94	67.6			24	60.0	
12–15			45	32.4			16	40.0	
Family social class[a]									0.93
High			68	48.9			15	37.5	
Middle			44	31.7			11	27.5	
Low			15	10.8			2	5.0	
Not reported			12	8.6			12	30.0	
Principal diagnosis									0.10
SAD			49	35.3			9	22.5	
SOP			64	46.0			20	50.0	
GAD			26	18.7			11	27.5	
Principal diagnosis CSR	7.01	1.10			6.92	1.19			0.60
Number of inclusion anxiety diagnoses	2.04	0.79			1.80	0.72			0.08
SCAS-C	36.77	16.87			34.61	15.58			0.50
SCAS-P	35.28	12.72			33.42	13.94			0.43
SMFQ-C	7.43	5.40			7.61	6.10			0.86
SMFQ-P	7.50	5.06			7.83	4.91			0.72
Other comorbidity									0.27
Other anxiety disorder			20	14.4			7	17.5	
Depression[d]			16	11.5			5	12.5	
Externalizing disorders[d]			15	10.8			1	2.5	
Tic disorder[d]			11	7.9			1	2.5	
Anorexia[d]			0	0.0			2	5.0[c]	
Post-treatment characteristics			(n = 139)				(n = 15[b])		
Principal diagnosis CSR	4.72	2.37			4.53	2.83			0.77
Comorbid inclusion anxiety diagnoses	0.52	0.73			0.20	0.41			0.02[c]
Loss of principal diagnosis[d]			56	40.3			7	46.7	0.63
Loss of all inclusion anxiety diagnoses[d]			37	26.6			4	26.7	1.00
SCAS-C	24.15	16.00			23.42	12.70			0.34
SCAS-P	27.58	13.64			23.83	11.52			0.34
SMFQ-C	5.66	5.93			3.17	4.15			0.08
SMFQ-P	5.49	4.91			5.17	6.56			0.82

Note. Externalizing disorders = Attention deficit hyperactive disorder and/or Oppositional defiant disorder; GAD = Generalized Anxiety Disorder; GCBT = Group Cognitive Behavioral Therapy; ICBT = Individual Cognitive Behavioral Therapy; Other anxiety disorder = OCD, Panic Disorder, PTSD, Specific anxiety disorder; SAD = Separation Anxiety Disorder; SCAS = Spence Child Anxiety Scale, C = Child, P = Parent; SMFQ = Short Mood and Feelings Questionnaire, C = Child, P = Parent; SOP = Social Anxiety Disorder.

[a] Family social class was defined by the highest-ranking parent. Parents were classified into rank-ordered social classes in accordance with the Registrar General Social Class coding scheme (Currie et al., 2008).

[b] Fifteen of the 40 participants not attending the long-term follow-up were assessed at post-treatment.

[c] Not significant after the modified Bonferroni procedure was applied.

[d] Due to small sample sizes, Fisher's exact test was used for these comparisons.

present long-term study and those who attended post-treatment assessment but did not participate in the present long-term follow-up (n = 15).

2.2. Treatment, setting, and therapists

The treatment manual used in the RCT was *FRIENDS for life*, 4th edition (Barrett, 2005). This program stems from the Australian Coping Koala program (Barrett, Dadds, & Rapee, 1991) that was adapted from Kendall's original Coping Cat manual (Kendall, 1990). Children aged 8–12 received the child version of the protocol, whereas youth aged 12–15 received the adolescent version. Youth aged 12 were treated using either the child (n = 34) or the adolescent version (n = 5), based on the clinician's assessment of the youth's level of maturity. The ICBT protocol comprised ten 60-min sessions, and the GCBT protocol comprised ten 90-min sessions. Two booster sessions were conducted, one and three months after the tenth session. Parents attended two of the ten sessions, the last 15 min of the remaining eight sessions, as well as two separate parent-only sessions.

The RCT was conducted at seven public child and adolescent mental health outpatient clinics. Seventeen therapists participated, of whom five had completed a formal 2-year post-graduation CBT training and the remaining 12 had little or no previous training in CBT. All therapists received training in the *FRIENDS for life* protocol, as well as supervision throughout the treatment sessions by licensed FRIENDS therapists. All treatment sessions were delivered as part of the therapist's routine caseload, and all therapists administered both ICBT and GCBT, with two therapists participating in each GCBT session. Assessment was conducted by 16 assessors, all clinicians employed at the clinics. Assessors received specific training in the Anxiety Disorders Interview Schedule child and parent version (ADIS-C/P) in a 2-day workshop, and received supervision during the study period. Therapists' treatment adherence and competence were assessed on a 7-point scale ranging from 0 (none/poor skills) to 6 (thorough/excellent skills). Therapists' mean scores for adherence to both treatment formats ranged from 3.97 to 5.42 (M = 4.60, SD = 0.88), and for competence 3.25–5.22 (M = 4.12, SD = 0.97), using the Competence and Adherence Scale for Cognitive Behavioral Therapy (CAS-CBT; Bjaastad et al., 2016). A predetermined score of 3.0 was set as the minimum threshold for adequate therapist adherence and competence. Further details on the protocol are as

previously described (Wergeland et al., 2014).

2.3. Measures

2.3.1. The Anxiety Disorders Interview Schedule child and parent version (ADIS-C/P)

The ADIS-C/P (Silverman & Albano, 1996) was used to assess inclusion diagnoses. The same modules assessing SAD, SOP and GAD which were used in the original RCT (pre-treatment, post-treatment, and 1-year follow-up) were also used in the long-term follow-up study, to provide comparable results across assessment points. The modules assessing DSM-IV criteria for the diagnoses of SAD, SOP, and GAD were used in youth aged 17 or younger (n = 107). Youth and parents were interviewed independently, with parents receiving the parent version of the Interview Schedule (ADIS-P) (n = 107). The CSR scale ranges from 0 to 8, with a minimum CSR score of 4 required for a clinical diagnosis to be assigned (Silverman & Albano, 1996). Diagnosis and CSR were assigned based on the youth and parent composite score. In cases of multiple anxiety diagnoses, the one causing the highest interference as measured by the CSR is considered to be the principal diagnosis. This interview was previously shown to have high interrater reliability (Silverman & Nelles, 1988) and retest reliability (Silverman, Saavedra, & Pina, 2001). For the purpose of the long-term follow-up study, the ADIS interview was slightly modified to also assess whether youth received additional treatment since completion of the treatment protocol.

2.3.2. The Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV-L)

The ADIS-IV-L (Brown, Barlow, & DiNardo, 1994) was used to assess DSM-IV criteria for SAD, SOP, and GAD in youth aged 18 or older (n = 32). Similar to the ADIS-C/P, the CSR scale ranges from 0 to 8, with a minimum CSR score of 4 required for a clinical diagnosis to be given. This interview method has previously demonstrated good to excellent reliability (Brown et al., 1994; Brown, Di Nardo, Lehman, & Campbell, 2001).

Diagnostic interviews at long-term follow-up were conducted face-to-face and video-recorded. Interviews conducted by phone (10.1%) were not recorded (see Section 2.4). A random selection of 20% of the video-recorded interviews was re-evaluated by expert raters blind to the assessors' ratings. The interrater agreement was k = 0.94 on the ADIS-C and/or ADIS-P and the ADIS-IV-L. For the principal anxiety diagnosis, k values were: SAD = 1.00; SOP = 0.88; and GAD = 0.81. Regarding CSR scores for the anxiety diagnoses, intraclass correlations (ICCs) for the total sample was 0.97, whereas ICCs for the principal anxiety diagnosis were: SAD = 1.00; SOP = 0.94; and GAD = 0.93.

2.3.3. The Spence Child Anxiety Scale child and parent version (SCAS-C/P)

The SCAS-C/P (Spence, 1998) was used to assess youth anxiety symptoms. The SCAS comprises 38 items rated on a 4-point scale (0 = never; 1 = sometimes; 2 = often; 3 = always), with a maximum sum score of 114. Validity, internal consistency, and adequate test–retest reliability were previously demonstrated (Spence, 1998; Spence, Barrett, & Turner, 2003). Internal consistency for SCAS in the current sample was good to excellent (parent α = 0.92, child α = 0.89).

2.3.4. The Short Moods and Feelings Questionnaire child and parent version (SMFQ-C/P)

The SMFQ-C/P (Angold, Costello, Messer, & Pickles, 1995) was used to assess youth depressive symptoms. The SMFQ consists of 13 items rated on a 3-point scale (0 = not true; 1 = sometimes true; 2 = true), with higher scores indicating greater severity of symptoms. In a general population sample, a cutoff score of $\geq$ 8 was found to represent the best balance between sensitivity and specificity, compared to a diagnosis of depression (Angold et al., 1995). The SMFQ was previously shown to have excellent internal consistency and good test–retest reliability in children over a 2-week period (Costello & Angold, 1988). The SMFQ differentiates well between psychiatric and nonpsychiatric subjects in a general population (Sharp, Goodyer, & Croudace, 2006). Internal consistency in the current sample was excellent (parent α = 0.92, child α = 0.93).

2.4. Procedure

At the time of inclusion in the original RCT, all 179 participants had consented to be contacted for long-term follow-up. At post-treatment, 154 youth completed the intervention and post-treatment assessment. Of these, 145 completed the 1-year follow-up assessment. At long-term follow-up, all 179 initial participants were contacted by telephone or mail. Among the treatment completers (n = 154), 15 did not wish to participate in the long-term follow-up. Thus, the present study sample comprised 139 youth, i.e., 77.7% of the total initial sample and 90.3% of treatment completers (See Fig. 1). Youth and families who agreed to participate were scheduled for separate youth and parent assessments. Most interviews were conducted face-to-face in the community outpatient clinics. Fourteen interviews were conducted by phone, due to participants having moved out of the region. Three certified ADIS-C/P interviewers (two psychologists and one child psychiatrist) conducted the interviews. The ADIS-C/P interview and questionnaires were completed in the same session, whereas those who were interviewed by phone received and returned the questionnaires by mail. Interviewers were blind to the youth's inclusion anxiety diagnoses, treatment format (ICBT or GCBT), and treatment outcome both at post-treatment and at 1-year follow-up. Participating youth and parents were each compensated with a gift card (worth US$60). The study was approved by, and conducted in accordance with the guidelines of Regional Committee for Medical and Health Research Ethics of Western Norway.

2.5. Data analysis

Analyses were based on the sample of 139 youth. There were no missing data regarding the diagnostic interviews. Missing data on items from the symptom measures SMFQ-C/P and SCAS-C/P ranged from 3.6% to 13.7%. Little's missing completely at random test indicated that missing data on symptom measures occurred completely at random. Missing data on all continuous variables were accounted for by full information maximum likelihood (FIML) in Mplus (Wothke, 2000), such that a missing data point did not result in list-wise deletion.

Descriptive statistics and analyses of group differences between participants and non-participants were performed using SPSS 23. All other analyses were run using Mplus 7.4 (Muthén & Muthén, 2017). To account for nonnormality present in the data, all structural equation modelling (SEM) analyses were run using a Maximum Likelihood estimator with Robust standard errors (MLR), which is robust to violations of nonnormality (Muthén & Muthén, 2017). Seven clinics participated in the study. The mean number of participants at each of the seven clinics was 20 (range 10–25). The GCBT format consisted of 16 separate treatment groups, whereas youth treated with ICBT were grouped as one cluster at each clinic (hence seven clusters), resulting in a total of 23 clusters. The design was therefore partially clustered, and models were adjusted to counter potential clustering effects (Baldwin, Bauer, Stice, & Rohde, 2011). The Holm–Bonferroni method was applied to control for experiment-related error rate at 0.05, when conducting multiple tests. Analyses were controlled for age, gender, and pre-treatment CSR score for the principal anxiety diagnosis.

At long-term follow-up, 27.3% of participants (n = 38) reported having received additional treatment for anxiety following study treatment completion. To examine whether additional treatment influenced study outcomes, all outcome analyses were performed with and without these participants. Since inclusion of participants receiving additional treatment was not found to alter the results, they were therefore included in all subsequent analyses (data not shown; available on request). Additional regression analyses of diagnostic treatment

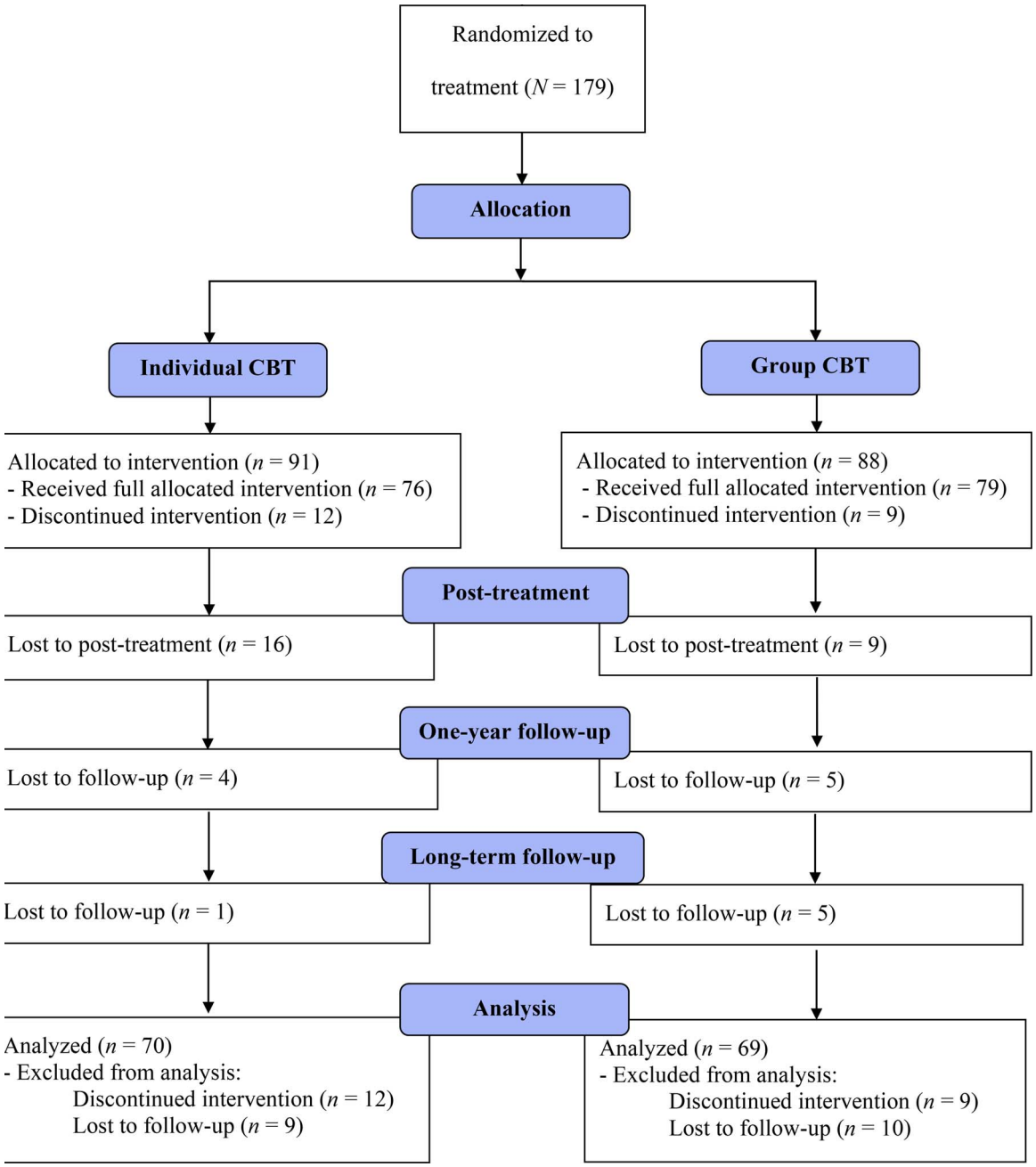

Fig. 1. Participant flowchart.

response during follow-up and the use of additional treatment were performed.

Primary outcomes were loss of all inclusion anxiety diagnoses (SAD, SOP, and GAD), and loss of the principal diagnosis. Thus, complete recovery was defined as loss of all inclusion anxiety diagnoses and recovery was defined as loss of principal inclusion anxiety diagnosis. Secondary outcomes were change in youth- and parent-reported anxiety, change in depressive symptoms and change in CSR of the primary, secondary and tertiary diagnoses. Growth rates and intercepts on CSR scores and symptom measures varied considerably between pre- and post-treatment. As a consequence, these were analyzed using piecewise latent growth curve modeling (p-LGM; Wang & Wang, 2012). To account for individually varying times of observation, random slopes for participants were estimated (Muthén & Muthén, 2017).

Secondary analyses included comparisons of the outcomes of ICBT versus GCBT and were estimated using logistic regression analyses for diagnostic outcomes, and p-LGM for symptom change. Given that a statistically non-significant result between the two treatment formats does not imply equivalence, we conducted analyses of equivalence between GCBT and ICBT. The analyses were conducted on the CSR of the principal anxiety diagnosis and youth- and parent-reported anxiety and depressive symptoms using the confidence interval (CI) method (Rogers, Howard, & Vessey, 1993). An equivalence interval of 15% around a difference of zero was defined, with GCBT outcomes as the reference group. Differences small enough to fall within this equivalence interval were considered to be of little clinical and/or practical importance.

To examine the impact of the principal anxiety diagnosis on outcomes, we used logistic regression analysis to estimate the odds ratio (OR) for loss of the principal diagnosis for each individual principal diagnoses. We then estimated the OR for loss of the principal diagnosis

Table 2
Loss of inclusion diagnoses following ICBT or GCBT and comparison between treatment formats.

ADIS-C/P combined diagnosis	Long-term follow-up							Post-treatment			
	Total sample (N = 139)		ICBT (n = 70)		GCBT (n = 69)		χ^2	ICBT (n = 70)		GCBT (n = 69)	
	n	%	n	%	n	%		n	%	n	%
Loss of all inclusion anxiety diagnoses	73	53.0	39	55.7	34	49.3	0.59	22	31.4	15	23.3
Loss of principal anxiety diagnosis	87	63.0	46	65.7	41	59.4	0.59	30	42.9	26	37.7

Note. GCBT = Group Cognitive Behavioral Therapy; ICBT = Individual Cognitive Behavioral Therapy.

and growth rates of the symptom measures using latent growth curve modelling for youth with a principal diagnosis of SOP or SAD, compared to those with a principal diagnosis of GAD.

3. Results

3.1. Primary research aim: diagnostic status at long-term follow-up

Of the 139 youth, 53% (n = 73) did not meet the criteria for any of their inclusion anxiety diagnosis at long-term follow-up, and 63% (n = 87) did not meet the criteria for their principal anxiety diagnosis. At post-treatment, for the same sample, the proportion of these participants was 27% (n = 37) and 40% (n = 56), respectively (see Table 2). Loss of principal and loss of all inclusion diagnoses differed between post-treatment and long-term follow-up, demonstrating a significant improvement ($p < 0.05$).

3.1.1. Diagnostic change during follow-up

In total 19% (n = 27) of the 139 youth had lost all inclusion anxiety diagnoses at post- and long-term follow-up, whereas 40% (n = 56) retained one or more inclusion anxiety diagnoses at post- or long-term follow-up. Of the 102 youth that had not lost all inclusion anxiety diagnoses at post-treatment, 45% (n = 46) had recovered completely at long-term follow-up. Regression analysis revealed no significant association between these 46 youth and the use of additional interim treatment (OR = 0.68, 95% CI [0.35, 1.32], p = 0.34). In total 31% (n = 43) of the 139 youth had lost their principal anxiety diagnosis at both post- and long-term assessment, whereas 28% (n = 39) retained their principal anxiety diagnosis at both assessment points. Among the 83 youth that did not lose their principal anxiety diagnosis at post-treatment, 53% (n = 44) recovered at long-term follow-up. Regression analysis revealed no significant association between these 44 youth and the use of additional interim treatment (OR = 0.87, 95% CI [0.48, 1.56], p = 0.69).

3.1.2. Clinical severity rating and symptom measures

Table 3 displays the severity ratings of the principal, secondary, and tertiary anxiety diagnoses and symptom measures at pre- and post-treatment and long-term follow-up. There was a significant reduction in CSR for the principal, secondary, and tertiary anxiety diagnoses ($p < 0.05$), as well as a significant reduction in symptom scores for all symptom measures from post-treatment to long-term follow-up ($p < 0.05$). Only youth self-reported depressive symptoms remained unchanged at long-term follow-up (p = 0.54). As found for post-treatment, analyses revealed no significant differences between the ICBT and GCBT conditions at long-term follow-up. No significant interaction effect between time and treatment format was found. Thus, the rate of symptom reduction during long-term follow-up was statistically similar for both treatment formats (i.e., ICBT and GCBT), and the improvement range for both treatment formats was also similar across time.

3.1.3. Relationship between treatment response at post-treatment and long-term follow-up

We examined the relationship between outcomes for the participants' principal anxiety diagnosis based on CSR scores at post-treatment and long-term follow-up, as detailed in Table 4. Based on criteria for clinically significant change by Jacobsen and Truax (1991), the participants' clinical status at post-treatment and at long-term follow-up, using their CSR scores in comparison with their pre-treatment CSR scores, was classified into four categories: *deterioration*: CSR score increased by ≥ 2 points; *no change*: CSR score changed by ± 1 point; *response:* CSR score decreased by ≥ 2 points; and *recovery*: CSR score decreased by ≥ 2 points and the score was ≤ 3. Of the 56 participants who were classified as recovered at post-treatment, 43 (77% of recovered participants, or 31% of the entire sample, n = 139) were still classified as recovered at long-term follow-up, whereas the remaining 13 (23%) had worsened to some degree and re-qualified for their principal diagnosis. Of the 26 participants classified as treatment responders at post-treatment, 17 (65%) had recovered at long-term follow-up, five maintained their treatment response status, whereas four had worsened and demonstrated no change from pre-treatment. Of the 53 participants classified as non-responders at post-treatment, 26 (49%) had recovered at long-term follow-up, eight (15%) were responders, 18 (34%) remained unchanged from pre-treatment, and one participant had worsened. Finally, of the four participants classified as deteriorated at post-treatment, one had fully recovered at long-term follow-up, whereas two demonstrated only marginal change and thus were classified as no change, and one remained classified as deteriorated. Summing up the number of participants who demonstrated maintenance, improvement, or worsening of their outcome status from post-treatment to long-term follow-up, 67 participants (48%) maintained their classification, whereas 54 demonstrated further improvement (39%), with 44 who fully recovered, and 18 participants (13%) worsened by re-qualifying for their principal diagnosis. Regression analysis of the presented changes in CSR scores, demonstrated a statistical significant relationship between treatment response at post-treatment and response at long-term follow-up (z = 3.0, $p < 0.01$), indicating further improvement during the follow-up period. Among youth recovering during follow-up (n = 44), chi-square analyses revealed no significant association with the use of interim mental health treatment and recovery (p = 0.22).

3.2. Secondary research aims

3.2.1. Individual versus group treatment

At long-term follow-up, logistic regression analyses demonstrated no statistical significant differences in loss of all inclusion anxiety diagnosis and loss of principal inclusion anxiety diagnoses between ICBT and GCBT, with GCBT as the reference (49% versus 56%, OR = 1.26, 95% CI [0.80, 2.01], p = 0.41), or loss of principal inclusion anxiety diagnoses (59% versus 66%, OR = 1.29, 95% CI [0.85, 1.84], p = 0.50). p-LGM analyses showed no statistical significant differences between ICBT and GCBT in youth-rated anxiety symptoms (z = 0.86, p = 0.39), parent-rated youth anxiety symptoms (z = 0.49, p = 0.63), youth-rated depressive symptoms (z = 0.10, p = 0.92), or parent-rated youth depressive symptoms (z = −1.28, p = 0.20).

Equivalency between ICBT and GCBT at long-term follow-up was established for the CSR outcome score of the participant's principal

Table 3
Severity ratings and symptom measures at post-treatment and long-term follow-up. Main effects of group and time and group by time interaction.

Measure	All patients		ICBT (n = 70)		GCBT (n = 69)			Pre-post		Post-LTFU	
	Mean	(SD)	Mean	(SD)	Mean	(SD)		β	z	β	z
CSR, principal anxiety diagnosis											
Pre-treatment (n = 139)	6.90	(1.14)	6.93	(1.09)	6.87	(1.19)	G	0.05	0.19	−0.12	−0.33
Post-treatment	4.72	(2.37)	4.74	(2.47)	4.71	(2.28)	T	−0.31	−10.57***	−0.05	−8.85***
LTFU	2.29	(3.10)	2.16	(3.11)	2.43	(3.11)	I	0.02	0.31	0.00	−0.31
CSR, secondary anxiety diagnosis											
Pre-treatment (n = 99)	6.31	(1.07)	6.23	(1.01)	6.39	(1.12)	G	0.05	0.18	−0.22	−0.61
Post-treatment	4.01	(2.47)	4.15	(2.55)	3.88	(2.41)	T	−0.13	−3.64***	−0.05	−6.24***
LTFU	1.27	(2.63)	0.92	(2.14)	1.61	(2.99)	I	0.06	0.90	−0.01	−0.81
CSR, tertiary anxiety diagnosis											
Pre-treatment (n = 45)	5.56	(1.22)	5.36	(1.09)	5.74	(1.32)	G	−0.10	−0.23	0.10	0.16
Post-treatment	3.96	(2.41)	4.05	(2.30)	3.87	(2.56)	T	−0.13	−3.64***	−0.05	−6.24***
LTFU	1.44	(2.81)	1.45	(2.84)	1.43	(2.84)	I	0.01	0.34	0.00	−0.31
SCAS-C											
Pre-treatment (n = 131)	36.77	(16.87)	36.19	(15.97)	37.73	(17.87)	G	−1.34	−0.54	0.35	0.16
Post-treatment	27.65	(15.52)	27.23	(16.39)	28.07	(14.72)	T	−1.43	−6.58***	0.09	−2.43*
LTFU	24.15	(16.00)	24.9	(14.13)	23.39	(17.78)	I	0.06	0.15	0.06	0.85
SCAS-P											
Pre-treatment (n = 133)	35.28	(12.28)	34.78	(13.35)	35.83	(11.08)	G	0.23	0.12	1.45	0.70
Post-treatment	27.58	(13.64)	28.15	(15.06)	27.02	(12.17)	T	−1.24	−7.24***	−0.15	−6.37***
LTFU	21.63	(13.26)	22.32	(16.69)	20.93	(13.90)	I	0.06	0.15	0.06	0.85
SMFQ-C											
Pre-treatment (n = 128)	7.43	(5.40)	7.33	(5.19)	7.54	(5.65)	G	−0.23	−0.30	−0.03	−0.03
Post-treatment	5.97	(5.34)	5.90	(5.10)	6.04	(5.60)	T	−0.22	−2.95**	−0.01	−0.62
LTFU	5.66	(5.93)	5.76	(5.67)	5.57	(6.22)	I	−0.03	−0.16	0.00	0.13
SMFQ-P											
Pre-treatment (n = 134)	7.50	(5.06)	7.43	(4.64)	7.57	(5.51)	G	0.37	0.71	0.68	0.93
Post-treatment	5.49	(5.49)	5.95	(5.06)	5.03	(4.76)	T	−0.30	−4.34***	−0.03	−2.80**
LTFU	4.35	(4.35)	4.57	(5.25)	4.13	(4.82)	I	0.33	2.03	−0.03	−1.70

Note. CSR = Clinical Severity Rating; G = Group; I = Interaction (all results obtained from Latent Growth Modeling in Mplus); LTFU = Long-Term Follow-Up; SCAS = Spence Children's Anxiety Scale, C = Child, P = Parent; SMFQ = Short Mood and Feelings Questionnaire, C = Child, P = Parent; T = Time.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

Table 4
Comparison of clinical improvement rates for principal diagnosis from pre- to post-treatment and long-term follow-up.

	Status at long-term follow-up				
Status at post-treatment	Recovery	Response	No change	Deterioration	Total
Recovery	43	4	6	3	56
Response	17	5	4	0	26
No change	26	8	18	1	53
Deterioration	1	0	2	1	4
Total	87	17	30	5	139

Note. Definition of the four categories relates to change in the clinical severity rating (CSR) of the principal diagnosis at post-treatment and at long-term follow-up in comparison with the pre-treatment CSR score. Definitions: *deterioration* = CSR increased by ≥ 2 points; *no change* = CSR changed ± 1 point; *response* = CSR decreased by ≥ 2 points; *recovery* = CSR decreased by ≥ 2 points and the score was ≤ 3.

anxiety diagnosis (± 0.94; 90% CI [−0.46, 0.71]). In contrast, equivalency was not established between the two treatment formats for SCAS-C (± 3.5; 90% CI [−6.25, 3.21]), SCAS-P (± 3.3; 90% CI [−5.38, 2.60]), SMFQ-C (± 0.84; 90% CI [−1.94, 1.56]), or SMFQ-P (± 0.62; 90% CI [−2.19, 1.08]).

3.2.2. Diagnosis-specific outcomes

Differences in outcomes for the three principal inclusion anxiety diagnoses were examined using multiple logistic regressions for diagnostic outcomes, with lack of diagnosis as the reference. p-LGM models were estimated for all symptom measures, and both types of analyses were controlled for age, gender, and pre-treatment CSR of the participant's principal disorder. The ORs for loss of the respective principal anxiety diagnoses at long-term follow-up were: SOP, OR = 0.27 (95% CI [0.15, 0.51], $p < 0.01$); SAD, OR = 1.88 (95% CI [0.99, 3.57], $p = 0.11$); and GAD, OR = 4.03 (95% CI [1.54, 10.56], $p = 0.02$). At post-treatment, the corresponding values were: SOP, OR = 0.63 (95% CI [0.35, 1.13], $p = 0.19$); SAD, OR = 0.60 (95% CI [0.33, 1.13], $p = 0.18$); and GAD, OR = 4.44 (95% CI [2.07, 9.52], $p < 0.001$).

With GAD as the reference, logistic regression analyses estimated that the OR for loss of all inclusion anxiety diagnoses at long-term follow-up was not statistically significant neither for SOP (OR = 0.47, 95% CI [0.21, 1.05], $p = 0.12$) nor for SAD (OR = 0.60, 95% CI [0.26, 1.40], $p = 0.32$). Following the same analysis procedure, the OR for loss of the principal diagnosis at long-term follow-up was lower for SOP (OR = 0.16, 95% CI [0.06, 0.44], $p < 0.01$), but not for SAD (OR = 0.47, 95% CI [0.16, 1.34], $p = 0.23$). There were no significant differences in the measures of anxiety (SCAS-C/P) and depressive (SMFQ-C/P) symptom reduction between SAD and SOP, compared to GAD, at long-term follow-up (data not shown).

4. Discussion

The present study is the first to assess the long-term effectiveness of a CBT protocol for youth with mixed anxiety disorders (SAD, SOP, and/or GAD) delivered in community mental health clinics. Our findings confirmed loss of all inclusion anxiety diagnoses in 53% of participants, and loss of the principal anxiety diagnosis in 63%. Significant

improvement was also evident in the anxiety symptom measure, but not in youth-rated depressive symptoms. No differences in diagnostic and symptom outcome measures were found between ICBT and GCBT. Furthermore, our results indicated that, compared to GAD, the chance of loss of the principal diagnosis was significantly lower for youth with a principal diagnosis of SOP at inclusion.

Analysis of diagnostic treatment outcomes indicated a significant improvement from post-treatment to long-term follow-up. Almost 50% of youth that retained their principal and/or all inclusion anxiety diagnoses at post-treatment lost these diagnoses at long-term follow-up. Also, significant reduction in anxiety symptoms was evident. Analysis of CSR response of youth's principal diagnosis between post-treatment and long-term follow-up, generally indicated maintenance or improvement of the initial response at long-term follow-up. Thus, the results largely confirm improvement during the follow-up period. In comparison, other long-term outcome studies confirm maintenance of post-treatment results but not improvement (Ginsburg et al., 2014; Kendall et al., 2004; Saavedra et al., 2010). Several explanations for this continued improvement may apply. Outcomes at post-treatment were in the lower range compared to other effectiveness and efficacy trials (Bodden et al., 2008; James, James, Cowdrey, Soler, & Choke, 2015; Lau et al., 2010; Warwick et al., 2017), leaving more room for improvement. Furthermore, clinical severity rating (CSR) of the principal anxiety diagnosis, and anxiety symptom change demonstrated steeper reductions from pre to- post, compared to post to long-term follow-up. Thus, the improvements may also relate to a delayed treatment effect, which may stem from a prolonged consolidation of acquired skills among youth and their parents (Ishikawa, Okajima, Matsuoka, & Sakano, 2007). Of notice; the treatment program used in this study consisted of 10 weekly sessions, whereas most other programs have 12–16 sessions (Bodden et al., 2008; Kendall et al., 1997). Thus, available time to conduct important CBT components such as exposure in this treatment protocol was limited. One may speculate whether youth had more time to implement and apply these skills after treatment, resulting in improved diagnostic outcomes. A final explanation may also be the effect of some spontaneous recovery among youth with anxiety disorders, as indicated by Nevo et al. (2014).

Our expectation that the long term outcomes in our effectiveness study would be below long term outcomes in efficacy studies was not consistently supported. In previous long-term efficacy studies reporting loss of all inclusion anxiety disorders, outcomes ranged from 47% to 86%, with an average mean follow-up of 9.5 years post-treatment and a weighted mean outcome of 53% (Barrett et al., 2001; Benjamin et al., 2013; Ginsburg et al., 2014). Our study result of 53% falls within the cited range and is consistent with the mean outcome from these studies. Regarding loss of the principal diagnosis, previous efficacy studies on long-term outcomes reported rates ranging between 65% and 90% (Ginsburg et al., 2014; Kendall et al., 2004), whereas the 63% loss of principal diagnosis in our study falls below the reported range. For long-term outcomes in youth with any anxiety disorder (with the exception of post-traumatic stress disorder and obsessive-compulsive disorder), treated with a broad scope of CBT formats, loss of all inclusion anxiety diagnoses has been reported with a mean outcome at 57% (range 47–68%), and loss of the principal anxiety diagnosis with a mean outcome of 77% (range 48–93%) (Gibby et al., 2017). The present results fall within these ranges, yet below the mean outcomes.

Several reasons might explain why the long-term improvement rates obtained in the present study are somewhat lower, compared to previous efficacy studies. Compared to patients from university clinics, youth with anxiety disorders treated in community clinics have been reported to have higher levels of anxiety symptoms and higher severity ratings of their principal anxiety diagnosis (Villabø, Cummings, Gere, Torgersen, & Kendall, 2013). In addition, in our sample, severity ratings at baseline for the principal diagnosis were greater than the CSR values reported in most other published studies in the field (mean CSR = 7.01) (Wergeland et al., 2014). Lower severity at pre-treatment may reflect less severe anxiety disorders, which are more amenable to therapy and thus remain in remission once effectively treated (Ginsburg et al., 2011). Moreover, 46% of our study participants presented with a principal diagnosis of SOP, which is more than the percentage of youth with SOP included in other long-term follow-up studies, e.g., 27.3% in Benjamin et al. (2013) and 21.2% in Barrett et al. (2001). Several previous studies of generic CBT protocols have associated the diagnosis of SOP with poorer treatment outcomes (Hudson et al., 2015; Reynolds et al., 2012). Finally, whereas university clinics are dedicated to clinical research, the primary mandate of community clinics is the provision of healthcare services to the community. Thus, therapists in research clinics commonly have more extensive training in the particular treatments provided and usually have more focused caseloads, thus allowing for the development of greater competency in delivering the specific treatment (Weisz, Krumholz, Santucci, Thomassin, & Ng, 2015). Most therapists who participated in our study had little or no experience in CBT prior to their participation. This may also have contributed to the lower long-term improvement rates obtained.

Our study showed no differences between ICBT and GCBT in long-term outcomes. This finding is in line with findings from meta-analyses of studies on short-term outcomes (In-Albon & Schneider, 2006; Silverman et al., 2008), as well as the long-term outcome efficacy study by Saavedra et al. (2010). Of interest on this point, comparable outcomes were also reported for ICBT and family CBT (Kendall, Hudson, Gosch, Flannery-Schroeder, & Suveg, 2008). Our results add to the research literature by demonstrating the long-term outcomes of CBT for anxiety disorders in a community mental health setting and by including an analysis of equivalence. Equivalency between the two treatment formats of ICBT and GCBT was established in terms of change in CSR for the principal anxiety diagnosis, although not for the other diagnostic and symptom outcome measures. Thus, our study findings partially confirm our prediction of equivalence between treatment outcomes for ICBT versus GCBT.

Our results indicated that the chance of recovery, i.e. loss of the principal diagnosis, was significantly lower for youth with a principal diagnosis of SOP. This is in line with findings reported by Hudson et al. (2015) and Crawley et al. (2008) demonstrating lower post-treatment outcomes following CBT in youth with SOP, compared to those with GAD and SAD. Interestingly, the ORs for recovery varied between post-treatment and long-term follow-up, depending on the pre-treatment principal diagnosis. Whereas youth with GAD and SAD showed increased odds for loss of principal diagnosis from post-treatment to long-term follow-up, SOP carried a lower chance of recovery during this period. This result was not affected by gender, age, or pre-treatment CSR of the principal diagnosis. Thus, despite an initial positive response to treatment, the post-treatment outcome in participants with a principal diagnosis of SOP waned over time. This finding is in agreement with that of Kerns et al. (2013). Hudson et al. (2015) suggested that generic CBT protocols might not be adequate to address the more specific characteristics associated with SOP, such as negative self-statements and social expectations (Spence & Rapee, 2016). This could mean that youth with SOP need more extensive treatment, allowing for more sessions of individualized exposure and consolidation of acquired skills than what was possible with the current protocol. In this regard, a shift towards more exposure at an earlier time during the course of treatment may be conducive to outcome improvement (Ale, McCarthy, Rothschild, & Whiteside, 2015).

The current study features notable strengths. It is the largest study to date to examine the effectiveness of a CBT protocol in youth with mixed anxiety disorders in a community mental health setting. Participants were routine referrals to community clinics, and only few exclusion criteria were applied. Recruitment, assessment, and treatment were undertaken by clinicians working at the participating clinics. The study achieved a high rate of participation, a low rate of missing data and the inclusion of four assessment points allowed for the use of advanced statistical models. Taken together, these factors contribute to a

high degree of generalizability to other community mental health clinics.

The present study also has limitations. First, the use of the ADIS-C/P was limited to the SAD, SOP and GAD modules. Assessment of comorbidity was based on the DAWBA interview, which was used only at inclusion (see Wergeland et al., 2014, for further details). Consequently, differential diagnoses and comorbidity based on the full ADIS-C/P could not be assessed, and the development of comorbid disorders through the trial and follow-up could therefore not be tracked. Functional outcomes were not included. The current assessment was cross-sectional, providing a brief glimpse of current symptoms and impairment. Although the study included a one-year follow-up assessment, data on the remission or recurrence of symptoms and diagnoses during follow-up was not available.

Another limitation of our study is the lack of a control group. This is an inherent limitation in most long-term follow-up studies, which prohibits causal associations between treatment and long-term outcome, given the influence of several likely confounding variables (Nevo & Manassis, 2009; Rith-Najarian et al., 2017). In light of this, we cannot exclude spontaneous remission or maturational effects as possible contributing factors to the continued outcome improvements reported in our long-term follow-up study.

The study took place in Norway, which may influence the generalizability of the results. Whereas community mental health care services are free of charge for youth in Norway, many university based research clinics charge a service-fee based on household income (Villabø et al., 2013). This may contribute to systematic differences in who chooses to seek treatment and comparability between studies. Typical of many Norwegian community samples, the sample population was primarily Caucasian and the findings may therefore not apply to other ethnic groups (Nilsen, Eisemann, & Kvernmo, 2013). Norway is also commonly characterized by high living standards and fairly homogenous economic and social stratification (Heiervang et al., 2007). Thus the findings may not apply to youth groups within other socio-economic strata.

In conclusion, our study demonstrates long term effectiveness of CBT for mixed anxiety disorders in youth. These findings provide encouragement for the wider use and implementation of CBT in community mental health clinics. Furthermore, the comparable outcomes for ICBT and GCBT allow practitioners flexibility in the choice of treatment format when managing youth with SAD, SOP and/or GAD. Choice of treatment format is not dependent upon youth clinical factors, but can be based on patient or parent preferences, community clinic resources or referral rates. While a community setting differs from a university clinic setting in many respects, and thus can be assigned responsibility for lower treatment outcomes, from a long-term perspective, our study results indicate that the impact of these differences on treatment outcomes might be overestimated. However, while our findings lend support to the suitability of the treatment approach in the community setting, a significant number of youth in our study still met the criteria for an anxiety diagnosis at long-term follow-up. In conjunction, poorer outcomes for youth with a principal diagnosis of SOP were found. Identification of long-term outcome predictors and moderators to allow for more individual tailoring of treatment for youth with a principal diagnosis of SOP in particular, but also for youth with mixed anxiety disorders in general, is an important subject for future research.

Conflicts of interest

All authors declare no conflicts of interest.

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