



Predictors of school-based cognitive behavior therapy outcome for youth with anxiety

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ABSTRACT

Meta-analyses of school-based CBT have shown that prevention for anxiety symptoms typically report small but significant effects. There is limited knowledge regarding which youths may benefit most and least from such programs, and characteristics of youth who respond differentially to interventions of different intensity. The present study examined predictors of school-based CBT outcomes among 302 youths (mean age 14.0 years, SD 0.8, 84% female) who participated in a randomized waitlist-controlled trial comparing a 10-session and a 5-session group intervention. Potential predictors included youth and parental factors, and credibility and expectancy of the interventions. Pre-intervention anxiety and depression levels, and clinician rated severity were examined as moderators of intervention effects. Outcomes were youth-, and parent-reported youth anxiety and depressive symptoms at post-intervention and 1-year follow-up. Higher parent-reported impairment from youth anxiety predicted larger parent-reported anxiety and depressive symptom change, whereas higher caregiver strain was associated with less symptom change. Higher parent rated credibility and expectancy was associated with improved outcomes at post-intervention. At 1-year follow-up, no predictors of outcome were identified. No moderators were identified. Families with high levels of caregiver strain associated with youth anxiety may need extra support regardless of length of intervention program. Parents' credibility and expectancy of interventions should be targeted to optimize school-based CBT.

1. Introduction

Indicated prevention using school-based cognitive behavior therapy (CBT) for youth with elevated levels of anxiety is intended to make evidence-based interventions more available to youths in the everyday context of their lives (Werner-Seidler et al., 2021). School-based interventions can improve access to care by alleviating key barriers such as

referral procedures, transportation, stigma, or issues related to cost (Choi et al., 2022). Thus, collaboration with school health services in delivering CBT can greatly expand the access to effective interventions for youth with anxiety, while conserving specialist mental health services for the management of more severe and complex mental health problems (Caron et al., 2020; Husabo et al., 2021). Better availability and accessibility of interventions for youth with mild to moderate levels

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of anxiety may have substantial impact on the individual, familial, and societal health burden. This is because anxiety is common, debilitating, often increases exponentially during adolescence, and is recurrent in course (Bitsko et al., 2018; Merikangas et al., 2010; Swan & Kendall, 2016).

Indicated prevention programs for anxiety are aimed at youth at risk of developing anxiety disorders (World Health Organization, 2004), and often recruit youth with heightened levels of symptoms but who do not meet the criteria for an anxiety disorder. Meta-analyses of school-based indicated prevention CBT programs for youth anxiety typically report significant but small effects (Hugh-Jones et al., 2021; Rasing et al., 2017; Werner-Seidler et al., 2021). However, although many youths experience meaningful improvements, there is high variability in response (Caldwell et al., 2019). Accordingly, identification of factors that impact individual differences in outcomes could help optimize interventions and better match youth to interventions that will meet their needs.

Meta-analyses and reviews have examined domains such as demographic factors (e.g., chronological age, sex, race, ethnicity, socioeconomic status), youth characteristics (e.g., diagnosis, symptom severity, impairment, comorbidity), parent characteristics (e.g., parent internalizing psychopathology, parenting), and contextual factors (e.g., family stressors, negative life events) among others, as possible predictors of outcome of CBT for youth with anxiety (e.g., Knight et al., 2014; Kunas et al., 2021; Norris & Kendall, 2021; Pegg et al., 2022). However, few factors have emerged as consistent predictors of youth anxiety CBT outcome, although there is some support for type and severity of youth mental health burden at pre-intervention (e.g., diagnosis, symptom severity, impairment, comorbidity), and parent internalizing psychopathology being related to poorer outcome (e.g., Knight et al., 2014; Kunas et al., 2021; Norris & Kendall, 2021; Pegg et al., 2022). Importantly, the studies mentioned above have mainly examined clinical samples comprising youth with diagnosable anxiety disorders. Very few studies have examined youth with sub-clinical symptoms receiving school-based CBT for anxiety. Recently, the School-Based Treatment for Anxiety Research Study (Orlando et al., 2022) examined therapist- (i.e., education, years of experience, work related stressors/barriers) and treatment-related predictors (i.e., dosage, therapeutic alliance, proportion of evidence-based structure elements). The results showed that the use of more evidence-based structure elements and higher child compliance with treatment were associated with better outcomes. In an earlier publication from the same study, moderator analyses indicated that older youth age, a diagnosis of social phobia, and more severe anxiety at pre-treatment were associated with stronger post-treatment effects in CBT relative to treatment as usual. At 1-year follow-up no moderators were identified (Ginsburg et al., 2020). In Ginsburg et al. (2020), eligible youth met criteria for a primary anxiety disorder, so it is not known whether these findings are valid for youth with subclinical anxiety.

Hence, the data are limited to guide decisions regarding which youth may benefit most and least from indicated prevention for anxiety. Also, we have limited knowledge on the characteristics of youths who respond differentially to interventions of different intensity. Brief CBT is commonly defined as having sessions reduced by at least 50% compared to standard treatment; however, core components and strategies are retained (Öst & Ollendick, 2017). Brief CBT interventions may concur with the limited resources often found in school health services and may fit better with the school context, due to schools being faced with numerous demands and standard CBT interventions being more lengthy and costly (Bennett-Levy et al., 2010). Importantly, not all youths may need the standard and more intensive intervention but could improve after brief CBT. Identification of possible moderator variables could provide the field with insight into differential responses from the interventions. Such knowledge could be used to optimize and individually tailor indicated prevention programs for youth with anxiety.

The current study is based on the paradigm of low-intensity CBT interventions. This paradigm emphasizes early intervention (e.g.,

indicated intervention for youth with mild to moderate mental health symptoms), increased access to effective interventions (e.g., offering intervention at schools and during school hours), reduced use of specialist therapist time (e.g., delivered by school health nurses with limited prior CBT experience), and applying CBT in more cost effective ways (e.g., by group delivery, by offering brief interventions, and/or introducing self-help material) (Bennett-Levy et al., 2010). Thus, the current study provides a unique opportunity to examine possible pre-intervention variables as predictors and moderators of outcome for youth with mild to moderate anxiety symptoms receiving indicated school-based CBT.

Based on the research cited above, youth factors, parental factors, and intervention factors were included as predictors in the present study. Regarding youth factors, level of anxiety symptoms, and impairment from anxiety on daily functioning, as well as self-reported victimization from bullying were included as predictors. The first two factors have been shown to be related to help seeking behavior (Angold et al., 1999), and treatment engagement (Lyneham et al., 2014), although the findings are inconsistent (Knight et al., 2014; Kunas et al., 2021). Low-intensity CBT may be more effective for milder forms of anxiety, with more severe cases not benefiting as much. A hallmark feature of anxiety is avoidance, and it may be that youth with more severe anxiety will benefit more from a standard compared to brief intervention due to a need for more time spent conducting exposure exercises and to apply the acquired skills (Kunas et al., 2021). Hence, anxiety symptoms and clinician rated severity of anxiety were included as possible moderators. Depressive symptoms were included as possible predictors of outcome since anxiety and depression are frequently comorbid (Kendall et al., 1992; Lawrence et al., 2015), both being associated with overlapping maladaptive emotion regulation strategies, and having shared vulnerability and maintenance factors (Schäfer et al., 2017). Furthermore, individuals with comorbid anxiety and depression experience greater impairment than individuals with a singular condition (Feske et al., 1998). High levels of depressive symptoms may also influence youth motivation and engagement in the interventions and has been associated with poorer treatment outcome (Walczak et al., 2018). As for levels of anxiety symptoms and severity, it may be that youth with more severe depressive symptoms will benefit more from a standard compared to brief intervention. The experience of stressful life events may be an important environmental contribution of risk for anxiety (Rasing et al., 2017). Perceived bullying is one specific event domain of stressful life-events. Bullying have been related to higher levels of internalizing problems and reduced self-esteem (Malecki et al., 2015). Experiences such as bullying may counteract intervention benefits, by making it difficult to apply newly acquired techniques (Shirk et al., 2009) Thus, we included youth perceived bullying as a predictor as this could potentially impact outcome of indicated interventions.

Concerning family-level factors, parent internalizing symptoms and caregiver strain were included as possible predictors. Certain family characteristics (e.g., parent mental health, family stressors) have been associated with increased risk for youth anxiety (Rapee et al., 2009). Lower caregiver involvement and support have emerged as predictor of poorer response in youth anxiety outcome (Schleider et al., 2015), although the effects have not been fully consistent (Norris & Kendall, 2021; Rasing et al., 2017). Caregiver strain refers to the negative thoughts (e.g., about stigma and guilt) and consequences (e.g., household disruption, financial difficulties) experienced by the caregiver when caring for a child with emotional or behavioral difficulties (Montgomery et al., 1985). Caregiver strain has previously been shown to predict unfavorable treatment outcome in studies of youth anxiety disorders (Schleider et al., 2015).

Factors related to the interventions such as credibility (i.e., how believable, convincing, and logical an intervention is perceived to be), and expectancy (i.e., the improvements believed to be achieved), and number of sessions, may be particularly relevant for anxious youth expected to face demanding tasks such as exposure in CBT (Kendall et al.,

2009). Examining whether credibility and expectancy of the intervention impact outcome is important because these factors may be amenable to change during the early phase of intervention (Greenberg et al., 2006). Therefore, a measure of credibility and expectancy was included as these were regarded as potential predictors in the present study.

The majority of indicated CBT interventions for anxiety delivered in schools comprises 8 to 12 sessions (Werner-Seidler et al., 2021). The number of sessions included in an indicated intervention program for anxiety may affect outcome, with some indications that more sessions are more effective (Johnstone et al., 2018). The main study (School Based Low-intensity Cognitive Behavioral Intervention for Anxious Youth) from which the present data were retrieved found both brief (5 sessions, comprising 5.5 h) and standard (10 sessions, comprising 15 h for youth and 3 h for parents) CBT to be effective. However, brief CBT was not noninferior to standard length CBT (Haugland et al., 2020). Currently, there is no research to inform choice of intensity of CBT and guide who will benefit most from standard or brief CBT when delivered as group-based CBT in the school setting. This is unfortunate, as the interest in brief forms of delivery is increasing. Examining whether youth with milder symptom severity would benefit from brief compared to standard interventions could inform us how to better optimize and individualize indicated interventions.

The aim of the present study was to examine predictors of outcome in Low-intensity CBT for youth with anxiety symptoms, and to examine whether pre-intervention symptom levels (i.e., anxiety, depression, clinician rated severity of anxiety) moderated the intervention effect. The predictors were organized into the following domains: youth factors, parental factors, and intervention factors. Outcomes were defined as anxiety symptom change (i.e., change in youth and parent-reported youth anxiety symptoms), and change in depressive symptoms (i.e., change in the youth and parent-reported youth depressive symptoms) at post-intervention and at 1-year follow-up.

We predicted that high pre-intervention levels of youth anxiety and depressive symptoms, higher impairment from anxiety symptoms, higher parent internalizing symptoms, higher caregiver strain, and higher levels of reported peer bullying would be associated with poorer outcome, whereas higher parental and youth credibility and expectancy would be associated with better outcomes, regardless of intervention condition. We also predicted that youth with higher initial levels of symptoms and clinician rated severity would improve relatively more in standard length CBT relative to brief CBT than those with lower initial levels.

2. Methods

This study was part of a randomized waitlist-controlled, indicated school-based group CBT trial for youth with anxiety symptoms. The main aims of the trial were to examine the effectiveness of indicated school-based CBT and to compare the effectiveness of two CBT interventions of different intensity (a brief, five session CBT program and a standard, ten session CBT program) in youth with anxiety. The procedures for recruitment of schools and participants, training of group leaders, and randomization have been reported elsewhere (Haugland et al., 2017, 2020) and are not presented in detail here. The study was approved by the Regional Committee for Medical and Health Research Ethics. The trial is registered at www.clinicaltrials.gov (NCT002279251).

Results are based on data from a sample of 302 youth randomized to brief and standard CBT. No significant differences in outcomes (anxiety symptoms, impairment from anxiety, or depressive symptoms at post-intervention or at 1-year follow-up) were observed between brief and standard CBT (Haugland et al., 2020).

2.1. Participants

The trial initially enrolled 313 youths (ages 12–16 years) recruited from 18 Norwegian junior high schools (17 public schools and 1 private school) from October 2014 to November 2016. The schools represent both rural and urban areas in Norway. Youth and/or parents were informed about the study at routine meetings with school nurses, information given by teachers, information in local media, or following a school survey of youth-reported anxiety symptoms (Raknes et al., 2017). Local nurses employed in the schools health services led the recruitment and inclusion process. Inclusion criteria were self-reported or parent-reported youth anxiety symptoms ≥ 25 on the Spence Children's Anxiety Scale (Spence, 1998), with at least some interference in daily life (a score of ≥ 1 on the first item on Child Anxiety Life Interference Scale; Lyneham et al., 2013). The youth and at least one parent had to understand Norwegian. Exclusion criteria were problems following group rules, disruptive behavior, or learning problems causing difficulties following a manualized group program, assessed by group leaders based on information from youth, parents, and teachers. To be as close as possible to "real-life practice", youth who received other mental health services (i.e., contact with specialized mental health services; psychotropic medication) were not excluded ($n = 31$; 9.9%).

Assent from the youth and informed written consent from the parent for youth aged 12 to 15, and informed written consent from each youth aged 16 was obtained, followed by baseline assessments and evaluation of inclusion and exclusion criteria. Groups of five to eight youth were recruited and assigned randomly at each school to brief (Vaag [Haugland et al., 2017; Raknes, 2010], $n = 91$) or standard CBT (Cool Kids [Rapee et al., 2006]; $n = 118$), or waitlist ($n = 104$). Youth on the waitlist condition were randomized (after the post-assessment) to brief CBT or standard CBT, except for 11 youth who withdrew after waitlist. This resulted in a final sample of 302 youth (mean age = 14.0 years, SD = 0.8, 84.4% female, 15.6% male). In total, 142 youth participated in the brief CBT intervention and 160 youth in the standard-length CBT intervention, in a total of 52 intervention groups. There were no pre-intervention differences between the two interventions on demographic or symptom measures (Haugland et al., 2020). Fifty participants (16.6%) did not complete the intervention. Completion was defined as attending ≥ 4 sessions of brief CBT and ≥ 7 sessions of standard CBT. There was no difference in retention ($p = .68$) between the two interventions (Haugland et al., 2020).

Most participants were Norwegian (96.7%), with Norwegian nationality defined as one or both parents born in Norway. The majority (78.8%) lived in two-parent households. The ranking of family social class was based on parent occupation in accordance with the Registrar General Social Class coding scheme (Currie et al., 2008) and defined by the highest ranking parent. Family social class was high for 26.5%, middle for 62.6%, and low for 10.9%.

2.2. Measures

Spence Children's Anxiety Scale (SCAS-c/p; Spence, 1998), child and parent versions, were used to assess youth anxiety symptoms. The SCAS comprises 38 items, rated on a four-point scale (from 0 = never to 3 = always). The internal consistency for the SCAS in the current sample was good to excellent (α : mother = 0.89, father = 0.89, youth = 0.91).

Child Anxiety Life Interference Scale (CALIS-c/p; Lyneham et al., 2013), child and parent versions, were used to assess life interference and impairment from youth anxiety in the areas of home, social life, school and activities. A nine-item scale was filled out, where each item was rated on a 5-point scale (from 0 = not at all, to 4 = a great deal). The internal consistency for the CALIS in the current sample was good (α : mother = 0.79, father = 0.84, youth = 0.86).

Short Mood and Feelings Questionnaire (SMFQ-c/p; Angold et al., 1995), child and parent versions, were used to assess child's depressive symptoms. The SMFQ comprises 13 items rated on a three-point scale (from 0 = not true to 2 = true). The internal consistency for the SMFQ in the current sample was good to excellent (α : mother = 0.81, father = 0.83, youth = 0.91).

Depression Anxiety Stress Scale (DASS; Lovibond & Lovibond, 1995) was used to assess parental self-rated depression, anxiety, and stress. The DASS short form was applied comprising 21 items; each rated on a four-point scale (from 0 = hardly ever to 3 = almost always). Internal consistency of the DASS in the current sample was excellent (α : mother = 0.92, father = 0.92).

Olweus Bully/Victim Questionnaire (OBVQ; Solberg & Olweus, 2003), revised version, was used to assess youth perceived bullying at school. A global question about bullying was used ("How often have you been bullied at school in the past couple of months?") rated on a five-point scale (from 0 = not at all, to 4 = several times a week), with a definition of bullying introduced prior to the question.

Caregiver Strain Questionnaire (CGSQ; Brannan et al., 1997) was used to assess parent-reported strain experienced by caregivers and the family when caring for a child with emotional or behavioral problems. The CGSQ comprises 21 items, each rated on a five-point scale (from 0 = not at all, to 4 = very much). The internal consistency of the CGSQ in the current sample was excellent (α : mother = 0.91, α : father = 0.98).

Clinical Global Impression scale (CGI; Guy, 1976) was used to assess global functioning covering the overall severity of anxiety symptoms (CGI Severity; CGI-S). CGI-S is scored on a seven-point scale and was completed by the providers of the intervention at pre- and post-intervention based on a joint semi-structured interview with youth and parents. All the semi-structured interviews were video recorded. Three expert scorers, masked to the group leaders' ratings, rated CGI-S for 20% of the interviews, randomly selected and stratified by condition, time, schools, and groups. Agreement between expert scorers and group leaders across CGI-S ratings was acceptable, with an average agreement intraclass correlation coefficient [ICC] (2.1) = 0.73.

Credibility and Expectancy Scale (CES-c/p; Devilly & Borkovec, 2000), child and parent versions, were used to assess youth and parent perceived intervention credibility and expectancy. Credibility refers to how believable, convincing, and logical an intervention is perceived to be, and expectancy refers to the improvements believed to be achieved during the intervention. The CES comprises 6 items and utilizes two rating scales: one from 1 to 9 (from 1 = not at all logical, to 9 very logical) and another from 0 to 100% (for rating of expected symptom improvement). Internal consistency of the CES in the current sample was excellent (α : mother = 0.97, father = 0.98, youth = 0.95).

2.3. Procedures

Assessments at pre-intervention, at post-intervention, and at 1-year follow-up were conducted with youth and parent (90.4% mothers). Fathers' ratings were used when mothers' ratings were not available. Youth and parents completed symptom measures electronically (see *Measures*). Socio-demographic information including age, sex, nationality, parents' education, and family economy, as well as the use of other health services and medication were collected at the pre-intervention assessment. A conjoint semi-structured interview developed for this study was conducted with the youth and parent(s). The interview included initial assessment of anxiety symptoms, severity and impairment, and what goals the youth aimed for with regards to anxiety, in addition to assessment of exclusion criteria. Any discrepancies between youth and parent(s) were resolved through discussion during the interview. The group leader rated CGI based on information from the interview. All questionnaires were completed at the pre-intervention assessment, except for the Credibility and Expectancy scale, which

was administered to the youth at the end of the first session and to parents after the first parent session. In these initial sessions, the rationale for and contents of the intervention had been presented. Youth and parents were informed that the youth could withdraw from the study at any time without giving any explanation.

2.4. Intervention

Vaag is a five-session manualized CBT program developed for the RCT study (Haugland et al., 2017). Each session has a duration between 45 and 90 min, with the first four meetings delivered weekly and a final session delivered five weeks after session four. The program includes a self-help material (Psychological First Aid Kit), which comprises a booklet, small figurines, and work sheets (Raknes, 2010). During the program the youth are encouraged to practice exposure on their own, assisted by the self-help material and two phone calls or text messages from the group leader. Both youth and parents participate in session two (a 60-min session) where helpful parenting strategies with anxious youth is discussed. The parents also receive written material focusing on parental support for youth anxiety.

Cool Kids is a 10-session manualized CBT program, with weekly 90-min sessions. In the RCT, the adolescent group-based, school version of Cool Kids was used (Rapee et al., 2006). The program includes separate workbooks for youth and parents, with session summaries, worksheets, and guides for home practice. Parents are invited to participate in two separate 90 min parent sessions where they are informed about the content of the program, and where parental support for youth anxiety is addressed. In the RCT, the Cool Kids program was administered with the same content and structure as in a previous school study (Mifsud & Rapee, 2005), except for the group meeting at session five that was replaced with an individual session (15–20 min for each participant) to ensure that individualized exposure plans were developed for each youth (Haugland et al., 2017).

Both Vaag and Cool Kids cover basic CBT principles for youth anxiety: psychoeducation, cognitive restructuring, exposure exercises and behavioral experiments, homework assignments, and parental involvement. An important difference between the two programs is the amount of group leader contact during the last five weeks, and the brief CBT program is shorter, more structured and allows for less flexibility. Both interventions were delivered at school, during school hours.

2.5. Group leaders

Each Vaag and Cool Kids group was administered by two group leaders who volunteered for the study and conducted the intervention as part of their ordinary workloads. The group leaders were recruited from community services (school nurses, $n = 21$; community psychologists, $n = 5$; or family therapist, $n = 1$), or from child and adolescent mental health services (social workers, $n = 3$; psychiatric nurse, $n = 1$, special education teachers, $n = 2$). Group leaders were 93.8% females (mean age = 43.2 years, $SD = 8.1$, range 32–62). Therapists had on average 6.7 ($SD = 6.7$, range 0–27) years of clinical experience, and 83.9% had no training in CBT before the study. They administered 1 to 8 groups (mean = 3.3, $SD = 1.8$), and 75% of the group leaders administered both interventions.

All group leaders attended a 4-day skills-training workshop on basic CBT principles for anxiety, both program manuals, and assessment procedures. They also attended two additional 2-day workshops (i.e., on youth anxiety, recruiting participants, exposure training, cognitive restructuring and group processes). They received regular supervision by experienced CBT therapists ($n = 10$) throughout the study. Instructions on duration, structure, and content of supervision were developed, and supervision was monitored by a checklist completed by supervisors following each session (Haugland et al., 2020).

2.5.1. Ratings of adherence and competence

All group sessions were videotaped; except for sessions with out-of-office exposure. Two sessions from each group were coded ($N = 104$ sessions), representing 40% of the sessions in Vaag (session 3 and 4) and 20% of the sessions in Cool Kids (session 6 and 7). These specific sessions were selected due to similar duration and content across interventions. To control for intervention differentiation, a 3-item measure was used indicating whether materials and concepts from one program was applied in the other. Adherence and competence were rated using an 11-item instrument (Bjaastad et al., 2016). Adherence was rated from 0 (“none”) to 6 (“thorough”), and competence was rated from 0 (“poor skills”) to 6 (“excellent skills”) for each item. Coding was done by seven clinical psychologists/psychiatrists trained in CBT for anxiety.

Using the criteria recommended by Cicchetti (1994) inter-rater reliability between expert scores and the remaining scorers was satisfactory for adherence [ICC (2,1) = 0.63], and for competence [ICC (2,1) = 0.69]. Scores for each group (mean of two rated sessions) ranged from 3.17 to 5.75 (mean = 4.41, SD = 0.56) for adherence, and 2.75 to 5.88 (mean = 4.18, SD = 0.66) for competence. Intervention differentiation between programs was excellent, with mean = 0, SD = 0 (Haugland et al., 2020; Husabo et al., 2021). Husabo et al. (2021) found that the levels of adherence and competence were adequate in both programs, but higher in brief compared to standard -length CBT. Neither adherence nor competence predicted clinical outcomes at any timepoints (Husabo et al., 2021).

2.6. Data analysis

Data from brief and standard CBT were combined for the current predictor analyses and were performed on the intention-to-treat sample ($n = 302$). In addition, separate analyses were performed on the sample of youth who completed the interventions ($n = 252$). The analyses were conducted for the two outcome criteria: change in youth anxiety symptoms reported by youth and parent, as assessed by the SCAS-c/p, and change in youth depressive symptoms reported by youth and parent, as assessed by SMFQ-c/p.

Univariate and bivariate statistics were analyzed with SPSS version 26.0 (IBM., Statistics, Chicago, IL, USA, 2020) and all models were analyzed with Mplus version 8.5 (Muthén & Muthén, 2020). Missing data at the item and scale level were examined using the missing value analysis in SPSS. The proportion of missing values of the predictors did not exceed 1.0% for any measure across informants, except for youth and parent-reported credibility and expectancy of the intervention, where 11.6% and 15.6% of the values were missing. Missing outcome data originated mainly from dropouts (16.6%) and from participants lost to 1-year follow-up (33.1%). Missing data were accommodated using full information maximum likelihood (FIML) methodology (Wothke, 2000) in Mplus. This assumes missing data to be randomly distributed (MAR) (Enders, 2010). Thus, a missing data point did not result in deletion of the participant. Nonnormality was evident in several outcome variables. To account for the nonnormality, analyses were pursued with the MLR estimator based on the Huber-White algorithm shown to be robust to violations of normality (Muthén & Muthén, 2011). The data were clustered with individuals grouped into intervention groups within schools, and the models were therefore estimated with cluster corrected standard errors.

To investigate potential independent pre-intervention predictors of response in reported anxiety symptoms, Latent Growth Curve Modeling (LGM) was used to model response to the intervention in youth- and parent-reported anxiety symptoms over time. These models included random intercepts and slope values, giving level and changes in outcomes both at the group and individual level. Time intervals between observations were spaced to 10 (post-intervention) and 62 (1-year follow-up) weeks. Changes from pre to post (slope 1) and post to follow-up (slope 2) were regressed onto the predictors, to examine main effects. To examine whether pre-intervention symptom levels moderated the

intervention effect separate regression models were run where intervention was included in the model together with the interaction terms between intervention and pre-intervention variables. Continuous variables were grand mean centered to reduce the problem with multicollinearity in the interaction terms (Cohen et al., 2002). The same model was repeated for all outcomes. To control for multiple testing, predictors were considered significant at a modified Bonferroni corrected α -level of 0.005.

3. Results

Demographic factors, mean scores at pre-intervention, and proportions of potential predictors are presented in Table 1. Mean scores on youth (42.35, SD = 17.04) and parent-reported youth (31.47, SD = 13.32) anxiety symptoms (SCAS c/p) were in the clinical and subclinical range, respectively (Arendt et al., 2014; Nauta et al., 2004). Mean scores for depressive symptoms (SMFQ c/p) were above clinical cut-off for youth and parent-reported youth symptoms (Larsson et al., 2016), and mean clinical ratings of global severity of anxiety (CGI-S) demonstrated a moderate severity.

Youth and parent-reported youth anxiety and depressive symptoms showed small to moderate correlations at all assessment points, with $r = 0.46$ at pre-intervention, $r = 0.42$ at post-intervention, and $r = 0.42$ at 1-year follow-up for anxiety. For depressive symptoms, the corresponding correlations were $r = 0.34$ at pre-, $r = 0.40$ at post-, and $r = 0.24$ at 1-year follow-up (Table S1). Due to these modest correlations, youth and parent-reported youth anxiety and depressive symptoms were treated in separate analyses (outcome variables).

At post-intervention, the observed mean change in youth-reported anxiety symptoms was -8.84 (SD 14.57) and from post-intervention to 1-year follow-up it was -2.78 (SD 11.70). For parent-reported youth anxiety symptoms, the corresponding mean changes were -8.07 (SD 10.21) and -3.52 (SD 9.42), respectively. For youth and parent-reported youth depressive symptoms the mean change were -1.60 (SD 6.13) and -4.90 (SD 6.00) at post-intervention, and -0.26 (SD 5.89) and -0.8 (SD 4.58) from post-intervention to 1-year follow-up, respectively.

Table 1
Demographic and clinical information at pre-intervention.

	%	M	SD
Age		13.98	.84
Sex			
Male	15.6		
Female	84.4		
Single parent status	20.9		
SES			
High	26.5		
Medium	62.6		
Low	10.9		
SCAS-c		42.35	17.04
SMFQ-c		11.51	7.11
CALIS-c		12.05	7.53
SCAS-p		31.47	13.32
SMFQ-p		11.15	6.51
CALIS-p		14.41	6.49
DASS		19.52	16.15
Bullying		0.40	0.89
CGSQ		42.09	11.08
CES-c		25.15	6.34
CES-p		27.16	5.17
CGI-S		4.27	0.85

Note. Observed proportions, means, and standard deviations of demographic information, and child- and parent-reported factors. SES = socioeconomic status; SCAS = Spence Children’s Anxiety Scale; SMFQ = Short Mood and Feelings Questionnaire; CALIS = Child Anxiety Life Interference Scale; DASS = Depression, Anxiety and Stress Scales; CGSQ = Caregiver Strain Questionnaire; CES = Credibility Expectancy scale; CGI-s = Clinical global impression-severity scale; c = child; p = parent.

Table 2
Predictors of youth-reported changes in anxiety symptoms in a latent growth curve model.

Anxiety symptoms (youth)	Pre to Post-intervention			Post to 1 year follow-up		
	B	SE (B)	p	B	SE (B)	p
	S1, S2 (intercept)	-8.60	4.18	0.040	-6.37	3.68
Youth factors						
SMFQ-c	-0.09	0.17	0.590	-0.22	0.17	0.201
CALIS-c	-0.37	0.20	0.059	0.03	0.18	0.850
Bullying	-1.18	1.25	0.345	-0.47	1.26	0.708
Parental factors						
SCAS-p	0.02	0.10	0.826	-0.25	0.10	0.010
SMFQ-p	-0.34	0.18	0.063	0.36	0.15	0.015
CALIS-p	0.16	0.21	0.445	-0.19	0.19	0.321
DASS	-0.09	0.05	0.092	0.11	0.05	0.018
CGSQ	0.01	0.09	0.903	0.09	0.09	0.324
Credibility Scale						
CES-c	-0.11	0.16	0.485	-0.10	0.13	0.443
CES-p	-0.46	0.18	0.003	0.28	0.14	0.052

Note. S = slope; SCAS = Spence Children’s Anxiety Scale; SMFQ = Short Mood and Feelings Questionnaire; CALIS = Child Anxiety Life Interference Scale; DASS = Depression, Anxiety and Stress Scales; CGSQ = Caregiver Strain Questionnaire; CES = Credibility Expectancy Scale; c = child; p = parent. B values indicate the effect of the predictor variable on weekly anxiety symptom level change.

3.1. Predictors of youth-reported anxiety symptoms

Higher parent-reported credibility and expectancy was associated with larger pre-to post-intervention youth-reported anxiety symptom improvement (Table 2). No predictors of youth-reported anxiety symptom improvement from pre-intervention to 1-year follow-up were found.

3.2. Predictors of parent-reported youth anxiety symptoms

Higher parent-reported youth impairment from anxiety and higher parent-reported credibility and expectancy were associated with a larger pre-to post-intervention parent-reported youth anxiety symptom improvement, whereas higher caregiver strain was associated with less symptom improvement (Table 3). No predictors for parent-reported

Table 3
Predictors of parent-reported changes in youth anxiety symptoms in a latent growth curve model.

Anxiety symptoms (parent)	Pre to Post-intervention			Post to 1 year follow-up		
	B	SE (B)	p	B	SE (B)	p
	S1, S2 (intercept)	-8.12	0.66	<0.001	-2.74	0.68
Youth factors						
SCAS-c	-0.04	0.05	0.465	-0.14	0.07	0.038
SMFQ-c	0.24	0.13	0.056	0.12	0.14	0.399
CALIS-c	0.03	0.19	0.895	0.17	0.18	0.356
Bullying	0.02	0.49	0.968	-1.54	0.85	0.069
Parental factors						
SMFQ-p	-0.07	0.12	0.550	-0.20	0.14	0.138
CALIS-p	-0.76	0.15	< 0.001	-0.01	0.18	0.970
DASS	-0.08	0.04	0.053	0.04	0.06	0.555
CGSQ	0.20	0.07	0.002	-0.03	0.08	0.702
Credibility Scale						
CES-c	0.14	0.11	0.204	-0.08	0.16	0.618
CES-p	-0.44	0.13	0.001	0.13	0.16	0.422

Note. S = slope; SCAS = Spence Children’s Anxiety Scale; SMFQ = Short Mood and Feelings Questionnaire; CALIS = Child Anxiety Life Interference Scale; DASS = Depression, Anxiety and Stress Scales; CGSQ = Caregiver Strain Questionnaire; CES = Credibility Expectancy Scale; c = child; p = parent. B values indicate the effect of the predictor variable on weekly anxiety symptom level change.

anxiety symptom improvement from pre-intervention to 1-year follow-up emerged.

3.3. Predictors of youth-reported depressive symptoms

Higher parent-reported credibility and expectancy was associated with a larger pre-to post-intervention youth-reported depressive symptom improvement (Table 4). No predictors for youth-reported depressive symptom improvement from pre-intervention to 1-year follow-up were found.

3.4. Predictors of parent-reported depressive symptoms

Higher parent-reported youth impairment from anxiety was associated with a larger pre-to post-intervention parent-reported youth depressive symptom improvement (Table 5). Parent-reported credibility and expectancy approached significance ($p = .006$). Also, higher caregiver strain was associated with a lesser symptom improvement. No predictors for parent-reported depressive symptom improvement from pre-intervention to 1-year follow-up emerged.

3.5. Moderators of outcomes

Pre-intervention level of symptoms (youth and parent-reported anxiety and depressive symptoms, and clinician rated severity of anxiety) did not moderate the outcome of brief or standard-length CBT at post-intervention or at 1-year follow-up (Supplementary materials S1a-S5b).

3.6. Supplementary analyses

As reported above, parent rated youth impairment from anxiety was a significant predictor of symptom improvement (i.e., higher pre-intervention symptom level predicted larger change). Still, youth with high pre-intervention parent rated impairment had higher impairment at post-intervention compared to youth with low pre-intervention impairment (M difference = 12.4, $t(27) = -5.1, p < .001$), and higher anxiety symptom levels (M difference = 16.2, $t(20) = -4.3, p < .001$), and impairment (M difference = 15.2, $t(20) = -4.7, p < .001$) at 1-year follow-up.

Table 4
Predictors of youth-reported changes in depressive symptoms in a latent growth curve model.

Depressive symptoms (youth)	Pre to Post-treatment			Post to 1 year follow-up		
	B	SE (B)	p	B	SE (B)	p
	S1, S2 (intercept)	-1.41	0.47	0.002	-0.29	0.52
Youth factors						
SCAS-c	-0.02	0.04	0.612	0.06	0.04	0.119
CALIS-c	-0.17	0.09	0.064	-0.21	0.11	0.070
Bullying	-0.17	0.54	0.753	-0.50	0.72	0.482
Parental factors						
SCAS-p	0.10	0.04	0.023	-0.08	0.05	0.103
SMFQ-p	-0.10	0.06	0.118	0.08	0.08	0.340
CALIS-p	-0.19	0.11	0.101	0.11	0.13	0.381
DASS	-0.01	0.03	0.674	0.00	0.02	0.961
CGSQ	0.06	0.05	0.270	-0.02	0.07	0.745
Credibility Scale						
CES-c	-0.07	0.066	0.305	0.01	0.08	0.886
CES-p	-0.14	0.072	0.004	0.26	0.10	0.022

Note. S = slope; SCAS = Spence Children’s Anxiety Scale; SMFQ = Short Mood and Feelings Questionnaire; CALIS = Child Anxiety Life Interference Scale; DASS = Depression, Anxiety and Stress Scales; CGSQ = Caregiver Strain Questionnaire; CES = Credibility Expectancy Scale; c = child; p = parent. B values indicate the effect of the predictor variable on weekly depressive symptom level change.

Table 5

Predictors of parent-reported changes in youth depressive symptoms in a latent growth curve model.

Depressive symptoms (parent)	Pre to Post-treatment			Post to 1 year follow-up		
	B	SE (B)	p	B	SE (B)	p
	S1, S2 (intercept)	-4.92	0.47	<0.001	-0.65	0.41
Youth factors						
SCAS-c	0.03	0.04	0.422	-0.04	0.04	0.316
SMFQ-c	-0.02	0.08	0.765	0.02	0.07	0.831
CALIS-c	0.07	0.09	0.483	0.04	0.08	0.602
Bullying	0.11	0.46	0.820	-1.18	0.53	0.035
Parental factors						
SCAS-p	-0.04	0.04	0.351	-0.04	0.04	0.301
CALIS-p	-0.31	0.08	<0.001	0.01	0.08	0.914
DASS	-0.01	0.02	0.588	-0.01	0.03	0.895
CGSQ	0.10	0.05	0.003	-0.02	0.05	0.606
Credibility Scale						
CES-c	-0.01	0.06	0.830	0.067	0.07	0.353
CES-p	-0.15	0.07	0.006	0.114	0.07	0.113

Note. S = slope; SCAS = Spence Children's Anxiety Scale; SMFQ = Short Mood and Feelings Questionnaire; CALIS = Child Anxiety Life Interference Scale; DASS = Depression, Anxiety and Stress Scales; CGSQ = Caregiver Strain Questionnaire; CES = Credibility Expectancy Scale; c = child; p = parent. B values indicate the effect of the predictor variable on weekly depressive symptom level change.

All predictor analyses were repeated using only intervention completers. In these analyses, the significant predictors found in the intention-to-treat group were replicated, except for the analysis of youth and parent-reported anxiety symptom improvement from pre-intervention to follow-up where the pre-intervention anxiety symptom level no longer predicted outcome (data not shown).

4. Discussion

The present study examined youth, parental, and intervention factors as predictors of outcome in school-based low-intensity CBT for youth with anxiety symptoms. The study also examined whether pre-intervention level of anxiety and depressive symptoms and clinician rated severity of anxiety moderated the outcomes of brief and standard CBT. We found a small number of predictors across different informants, focusing on youth and parent reported youth anxiety and depressive symptoms as outcomes. The most consistent findings were that higher parent-reported credibility and expectancy of the intervention and higher parent-reported youth impairment from anxiety predicted greater symptom improvement, whereas higher caregiver strain was associated with less symptom improvement at post-intervention. At 1-year follow-up, we found no significant predictors. Response across the outcomes were not moderated by pre-intervention symptom levels or clinician rated severity, indicating no individual difference in outcome to brief and standard-length interventions.

The finding that credibility and expectations of the intervention were predictors of outcome was found only for parent-report but was reflected across three out of four outcomes. Parents who, at the start of the intervention, expected the intervention to be effective for their youth and who reported higher ratings in how believable, logical, and convincing the intervention was, reported larger improvement in youth anxiety and depressive symptoms post-intervention compared to those reporting lower expectations and credibility of the intervention. Previously, a positive relationship between expectancy and outcomes has been reported for youth seeking treatment for OCD (Lewin et al., 2011), for anxiety (Norris et al., 2019), as well as for level of treatment adherence (Lee et al., 2019; Wergeland et al., 2015) across different informants. However, other studies of clinical samples have found that parent and child expectancy were not related to anxiety treatment outcome (Compton et al., 2014). Albeit parent and youth-reported

credibility and expectancy were correlated in the present study, only parent rated credibility and expectancy was associated with outcomes. Both brief and standard-length intervention included limited parental participation. However, parents are often those who initiate mental health interventions for youth and may also impact the decision to terminate interventions. Furthermore, it might be that parents perceived the intervention relevant to the youth's problem. It is therefore not surprising that parental beliefs are associated with outcomes. Previous research has shown that different informants commonly provide discrepant reports of youth's symptoms and service needs, and that these discrepant reports are related to service outcome for youth with internalizing disorders (De Los Reyes et al., 2022). Our findings highlight the need for examining parental perceived credibility and expectancy at the start of the intervention. To enhance outcomes, parental assumptions about the intervention may be addressed during the initial assessment and the psychoeducational part of CBT programs. This may be particularly relevant in low-intensity school-based CBT for anxiety where both parents and youth need to understand and carry out demanding exposure tasks considered important for progress and outcome, as there is limited in-session parental participation. Youth often need parental support and help to do between-session exposure tasks, and this may be more challenging in families where parents perceive the program to have limited credibility and expectancy. Concerning the null findings regarding youth credibility and expectancy, this may be because youth have limited experiences of what the intervention entails, and do not have the experience to evaluate credibility and expectancy after having received a thorough description of the CBT intervention (Lewin et al., 2011).

Higher parent-reported impairment from anxiety in youth was associated with higher post-intervention parent-reported youth anxiety and depressive symptom change. Functional impairment has been evaluated as a severity marker in youth anxiety (Compton et al., 2014). Our finding may be attributed to the greater room for improvement for those with higher pre-intervention symptom levels. Still, youth with higher levels of impairment and symptoms must achieve a larger decrease in symptoms to reach a subthreshold level of impairment, and they may still end intervention with higher severity levels indicating a need for further services. It may also be related to that parents experiencing their youth as having more severe symptoms may be more relieved and motivated, and positively responding to their youth receiving an intervention and, thus, report a greater change (Kunas et al., 2021). Our findings are in line with previous studies finding symptom severity as a predictor of greater response on anxiety symptoms during CBT (Liber et al., 2010; Wergeland et al., 2016).

Higher caregiver strain was related to less parent-reported youth anxiety and depressive symptom improvement at post-intervention. Caregiver strain refers to negative thoughts and feelings including consequences parents experience when caring for a child with emotional difficulties (Montgomery et al., 1985). There was limited parental participation in the interventions, however, parents were invited to participate in selected sessions. The parents received psychoeducation on anxiety, verbal and written information on helpful parenting and ways to support their anxious youth for example with exposure exercises. It may be that high levels of family stressors interfere with the caregivers' capacity to positively engage with their youth, and their ability to support the youth during the intervention. Similar associations have been reported in a previous treatment study on anxiety using the same measure of caregiver strain (Compton et al., 2014). However, the relationship between caregiver strain and intervention outcome is likely complex and involve multiple factors such as family functioning and parental psychopathology (Ginsburg et al., 2004; Schleider et al., 2015). For example, one study found that reductions in caregiver strain and improvement in family function jointly explained relations between parent-reported psychological distress and posttreatment anxiety symptom reduction (Schleider et al., 2015). As findings suggest that caregiver strain is related to youth anxiety symptom reduction,

assessing, and targeting these factors within families could be important to enhance outcome from low-intensity CBT. Furthermore, the identification of high levels of caregiver strain could indicate a more complex service need (Schleider et al., 2015). Regarding the potential predictors parental internalizing symptoms, self-reported bullying, or level of youth depressive symptoms, neither of these were related to outcome.

Contrary to expectations we did not find that pre-intervention level of youth and parent-reported anxiety and depressive symptoms, or clinician rated severity of anxiety moderated the outcome of brief or standard-length CBT, neither at post-assessment nor at 1-year follow-up. The findings indicated that youth improved across outcome measures regardless of the pre-intervention symptom level in both intervention groups. However, the brief intervention was not non-inferior to the standard intervention (Haugland et al., 2020). An examination of moderating effects on outcomes may be particularly relevant when comparing brief versus standard length CBT, as it is possible that certain youths may benefit from a brief intervention whereas others need a standard-length intervention. It has been suggested that programs containing a greater number of sessions may increase effectiveness (Johnstone et al., 2018). A meta-analysis of universal school-based prevention program for anxiety and depression in children reported number of sessions within a program to moderate outcome at long term follow-up (Johnstone et al., 2018). However, another meta-analysis found no such relationship (Fisak et al., 2011). It should be noted that pre-intervention symptom severity was not examined as a moderator in these meta-analyses. By understanding specific differences between youth who responds to an intervention and not and by identification of possible moderators, optimal treatment selection could be facilitated, and more well-founded use of professional and economic resources provided (Dow et al., 2007). In our study we did not identify specific youth characteristics that could guide intervention selection between a brief and a standard intervention. Additional research is needed to examine under what circumstances brief and standard CBT are optimal for specific youth with anxiety.

Adolescence is a developmental period vulnerable for anxiety, making it an ideal time for early intervention. Internalizing symptoms tend to persist or increase throughout adolescence, thus, youth with heightened anxiety may be at risk of developing an anxiety disorder (Prinzie et al., 2014). Only a small proportion of youth experiencing these challenges are identified and receive services (Alonso et al., 2018). Schools are well positioned to promote and implement indicated interventions aimed at youths with subclinical symptoms of anxiety, and such interventions could help overcome the access gap by making effective interventions available (Werner-Seidler et al., 2021). Furthermore, schools can provide interventions in an environment that involves common anxiety provoking situations, and exposure tasks can more easily be conducted through collaboration with teachers and fellow students, and thereby facilitate skills acquisition (McLoone & Rapee, 2012). Also, common treatment barriers such as travel time, convenience of location, transportation, and cost can be reduced and alleviated (Reardon et al., 2017). Low-intensity CBT fit well with the school health system and circumvent these barriers, by making the programs more accessible and available in the youths' everyday life.

The study's design provided an opportunity to examine pre-intervention factors predictive of outcome from indicated school-based CBT for youth with anxiety, and to help identify whether pre-intervention symptom levels moderated brief and standard CBT outcome. The results should be viewed in the context of some limitations. First, our study was not primarily designed to examine predictors, and as such the predictor and moderator analyses should be considered within a hypothesis-generating context. In addition, the identification of predictors and moderators of outcome was limited by the selected variables on which data were collected. This model specification and potential misspecification has consequences for the statistical power for the main- and interaction effects. There may be other pre-intervention variables of potential predictive and moderative influence in relation

to outcome in indicated school-based CBT not included (e.g., characteristics of school environment, school connectedness, school attendance). There may also be variables, measured early during the intervention, that could be relevant predictors to examine. Ideally, the measure of credibility and expectancy should have been completed at the same session for youth and parent but was completed at the first session for youth and at the first parent session, respectively, when the rationale for treatment had been explained. The first parent session was commonly held at week two across the two interventions. Even if not strictly assessed pre-intervention as the other predictors, we believe credibility and expectancy contribute with important information when examined as a predictor. Also, except for clinician rated clinical global impression-severity scale, only measures of self-reported or parent-reported symptoms were included. The use of self-report measures may impact the validity of the outcomes due to demand effects. However, to conduct diagnostic assessments by an independent evaluator within a school-based study were considered not feasible although it would have strengthened the study. Finally, the dropout rate was high over time, with 33% at one year follow-up. Although missing values were accounted for in the estimated models under MAR assumption, we do not know if missing over time was at random. This difference is not empirically testable and can only be analyzed with sensitivity analyses with missingness included in the joint statistical models, for example the Diggle-Kenward and pattern-mixture models (Enders, 2010). However, these models assume strict statistical assumptions and we decided not to explore these models.

In conclusion, the results of the present study identified a small number of variables which were related to CBT outcomes in youth with anxiety receiving low-intensity school-based CBT. In view of the increasing interest in brief forms of CBT, the current study did not find pre-intervention variables that could inform the choice of length of CBT. Therapists should be aware of the importance of parents' perception of credibility and expectancy of the intervention as well as level of caregiver strain. These factors should be and examined and targeted to optimize school-based CBT outcomes.

CRediT authorship contribution statement

Gro Janne H. Wergeland: Concept or design of the study, Acquisition of data, Analysis of data, Data interpretation, wrote the first draft of the introduction, methods, results, and discussion. **Åshild T. Haaland:** Concept or design of the study, Acquisition of data. **Krister W. Fjermestad:** Concept or design of the study, Acquisition of data, Data interpretation. **Lars-Göran Öst:** Concept or design of the study, Data interpretation. **Rolf Gjestad:** Analysis of data, Data interpretation. **Jon F. Bjaastad:** Concept or design of the study, Acquisition of data. **Asle Hoffart:** Concept or design of the study, Acquisition of data. **Elisabeth Husabo:** Acquisition of data. **Solfrid Raknes:** Concept or design of the study, Acquisition of data. **Bente S.M. Haugland:** Concept or design of the study, Acquisition of data, Data interpretation. All authors have reviewed and approved the final manuscript.

Declaration of competing interest

Dr. Raknes has received royalties from sales for the self-help material in the Vaag program (the Psychological First Aid kit). No potential conflict of interest is reported for any of the other authors.

Data availability

Data will be made available on request.

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Appendix A. Supplementary data

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