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Targeting Internalizing Symptoms in Children: What is the Impact on School Functioning?

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ABSTRACT

Internalizing problems may be associated with poor academic performance and school absenteeism among youth. This study investigated the impact of the EMOTION: “Coping Kids” Managing Anxiety and Depression Program on academic achievement and school adaptation in children. Data were collected in a national cluster-randomized controlled trial at three time points in Norway. Children ($N = 688$, 8–12 years), who had elevated levels of anxiety or depressive symptoms from 36 schools participated. There were no significant differences between the intervention and control groups post-intervention or at 12-month follow-up regarding academic achievement and school adaptation. Likewise, no significant intervention effects were identified for school-related variables in the anxiety-only, depression-only, or combined (anxiety and depression) groups. The intervention did not have an impact on school functioning. Thus, focusing on school-related challenges and enhanced collaboration with teachers, possibly through a tailored version of the EMOTION program, could be an interesting adaptation of the intervention.

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Introduction

Good school functioning is important to promote children’s social functioning and mental health and prevent absenteeism in primary school and possible dropouts from upper-secondary school (Durlak et al., 2011; Gustafsson et al., 2010; Ingul et al., 2012; O’Connor et al., 2018; Sagatun et al., 2014). Children with healthy cognitive and socio-behavioral development who can cope with new situations and peers tend to adapt well to school (Haynes et al., 2003; Tetzchner, 2012). School functioning refers to a wide range of aspects, including school attendance, learning capacity, academic achievement, attitudes, behaviors, and social relationships (Gustafsson et al., 2010).

Studies have shown a bidirectional association between children’s mental health and school functioning, with problems in one domain affecting the other (Bru et al., 2016; Gustafsson et al., 2010; Ogden & Hagen, 2014; Weidman et al., 2015). For children, internalizing problems (e.g., anxiety and depression) and living with various risk factors may lead to academic difficulties,

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and academic difficulties could lead to internalizing problems later in life (Deighton et al., 2018; Grover et al., 2007; Masten et al., 2005; McCarty et al., 2008). Despite the potential negative impact on different life domains, including school functioning, children with internalizing problems are less likely to receive help than children with externalizing problems (Heiervang et al., 2007; Stallard et al., 2008). Interventions that address internalizing problems, especially depression in younger children (i.e., prior to middle school; (Arora et al., 2019)) are rare. A study on available mental health services for children across Europe showed that there is a substantial unmet need for mental health care (Kovess-Masfety et al., 2017). This circumstance involves costs and represents serious problems not only for individuals but also for the society, and it has consequences for public health (Reneflot et al., 2018).

School interventions targeting internalizing problems are often based on principles from cognitive behavioral therapy (CBT) (Paulus et al., 2016). An overview of systematic reviews and meta-analyses on school based mental health interventions, including anxiety and/or depression as an outcome variable, showed that school interventions can have a positive preventive effect on anxiety and depression (Skogen et al., 2018). In addition, most of these studies revealed that the interventions had small positive effects in the reduction of anxiety and/or depression. However, these effects were only statistically significant for up to 12 months after the intervention (Hetrick et al., 2016; Moreno-Peral et al., 2017; Stockings et al., 2016; Werner-Seidler et al., 2017).

School-based interventions may reach children of all ages with internalizing problems (Cheung et al., 2007; Mifsud & Rapee, 2005), potentially improving their school functioning and providing opportunities for collaboration between mental health professionals and school personnel. Although schools are considered a suitable arena for prevention, there is a lack of knowledge on how best to implement interventions in these settings (Hugh-Jones et al., 2021). Prevention programs can be universal (targeting all children), selective (targeting risk groups; e.g., children of parents with psychopathology), or indicated (targeting high scorers for predefined problems) (Greenberg, 2010; Mrazek & Haggerty, 1994). Selective and indicated programs aimed at preventing anxiety or depression in children and adolescents have shown to be more promising than universal ones, according to several reviews and meta-analyses (Fisak et al., 2011; Hetrick et al., 2016; Horowitz & Garber, 2006; Hugh-Jones et al., 2021; Merry et al., 2012; Stice et al., 2009). In contrast, a recent review revealed that there is a lack of evidence to support any one type of intervention as being effective in preventing depression in universal or targeted settings; in addition, to reduce anxiety symptoms, universal settings that included mindfulness and relaxation techniques achieved better results (Caldwell et al., 2019). Furthermore, several studies have argued that there is insufficient evidence to support the implementation of prevention programs for depression (Arora et al., 2019; Hetrick et al., 2016).

Research on intervention effects has mainly focused on symptom reduction as the primary outcome measure; however, Swan and Kendall (2016) highlighted the importance of examining changes in school functioning in addition to in other domains. A review of over 100 studies on universal, selective, and indicated school-based interventions for depression, revealed that few interventions focused on academic outcomes, especially for pre-adolescents (Arora et al., 2019). Earlier meta-analyses have pointed out that only a minority of studies included academic outcomes (mostly academic scores and school attendance) (Hoagwood et al., 2007; Sanchez et al., 2018). The majority of studies focused on externalizing problems (prevention of behavioral problems) and adopted universal approaches, having modest effects on academic outcomes that were not sustainable over time. The lack of inclusion of academic outcomes in mental health interventions is somewhat surprising given the extensive research on the associations and bidirectional associations between mental health and academic achievement.

Previous studies suggested that universal programs that promote individual well-being, social interaction, and coping skills may influence a wider range of outcomes, such as the atmosphere and daily life in school and academic achievement (Adi et al., 2007; Durlak et al., 2011; Holen et al., 2013). However, due to a lack of research on long-term, school-related outcomes, the benefits of school-based programs over time are somewhat unclear (Durlak et al., 2011). In addition,

Durlak's (2011) meta-analysis did not include children with preexisting emotional or academic problems, and only 15% of the included studies reported academic outcomes. One study, including academic outcomes, reported no effect on academic performance after participating in a universal FRIENDS-program (Skryabina et al., 2016). Results were based on standardized tests in reading, writing, and math at 12 months post-intervention, without assessment of other outcomes, such as adaptation, attendance, or attitudes toward school. Another study with children aged 12–13 years from low socioeconomic backgrounds showed that even the indicated version of the FRIENDS for life had no impact on school adjustment, according to self- and teacher-report measures (Rodgers & Dunsmuir, 2015). The program has CBT components (e.g., coping step plans or relaxation) that could be tailored to target specific anxiety symptoms associated with school functioning, and that specifically adjusting to academic settings could have produced a different result. In contrast, a meta-analysis of anxiety-focused CBT for children and adolescents from clinical samples reported results limited not only to symptom reduction but also showing functional improvement in several areas, including school, family, and peer interactions. At follow-up, these gains appeared to be maintained or even improved (Kreuze et al., 2018). Other studies that investigated the impact of anxiety reduction on academic achievement after participation in CBT-based interventions, have found improved achievement in children aged 6–13 years (Suveg et al., 2009; Wood, 2006), improved overall school functioning in children aged 7–17 years (completing assignments, concentrating on work, doing homework, getting good grades, giving oral reports, taking tests/exams, writing in class) (Nail et al., 2015), and improved grade point averages (GPA) in children aged 13–16 years (Weems et al., 2009). However, all these studies were performed on clinical samples, and except for one, academic performance was rated by parents.

As described above, interventions targeting anxiety and depressive symptoms vary with respect to their effects on school functioning; some report improvements, while others do not. Furthermore, most studies have included children in the clinical range or been conducted on adolescents. In addition, most of the evaluated school-based programs were universal, aiming at behavioral problems. School outcomes of mental health interventions are scarce, and if present, they tend to be based on grades, standardized performance scores, or parent-rated school-performance. Few studies have investigated whether an indicated, preventive intervention targeting both anxiety and depressive symptoms has the potential to improve school functioning in children. In the current study, we examined the effectiveness of the Norwegian version of the transdiagnostic EMOTION: “Coping Kids” Managing Anxiety and Depression Program (Martinsen et al., 2014), on academic achievement and school adaptation, measured as secondary outcomes. Academic achievement is understood as a child's academic performance in different subjects, and school adaptation is defined as adaptive functioning at school (e.g., effort, behavior, learning, mood) compared to other children of the same age. Previous findings indicated that the children participating in this study had significantly reduced anxiety and depressive symptoms (Martinsen et al., 2019), increased emotional regulation skills (Loevaas et al., 2019), and increased self-reported quality of life and self-esteem after participating in the EMOTION intervention (Martinsen et al., 2021). Further, at 12-month follow-up, participating children and parents reported a small, but significant, reduction in anxiety symptoms, while parents reported a significant reduction in depressive symptoms (Løvaas et al., 2020). Considering these findings, we aimed to examine whether the positive effects of the intervention also extended to improved academic achievement and school adaptation, as assessed by the children's teachers. Thus, we investigated the following research questions:

1. Does the EMOTION intervention, which targets anxiety and depression among 8- to 12-year-old children, improve academic achievement and school adaptation post-intervention and at 12-month follow-up?
2. Are there any differences in the intervention effects when the children are divided into three subgroups based on baseline symptom levels: (i) anxiety symptoms only, (ii) depressive symptoms only, or (iii) combined symptoms of anxiety and depression?

Materials and Methods

Procedure

The study was based on a cluster randomized controlled trial (cRCT) investigating the effects of the indicated EMOTION intervention for children, delivered in a school setting. The trial was approved by the Data Inspectorate and the Regional Committee for Medical and Health Research Ethics of Norway (REC), Region South and East Norway, and is registered at www.clinicaltrials.gov (Identifier: NCT02340637, June 2014).

Thirty-six public schools from rural, urban, and suburban areas in Northern, Middle, and South-East Norway participated in the study. Cluster randomization was performed at the school level in the first semester of data collection. The 36 schools were matched for size and geographic location and randomly assigned to either the control or intervention condition, with 18 schools in each condition. Due to feasibility and to avoid contamination between participants within the same school, the conditions were maintained throughout the waves.

Power calculations, accounting for the multi-level nature of the sample, were performed prior to the main study. A sample comprising a total of 560 children from 23 schools was deemed sufficient, based on an anticipated effect size on anxiety and depression of 0.35, and an intraclass correlation coefficient of 0.05. For more details, see the study protocol (Patras et al., 2016). The intervention ran from 2014 until 2016, with new children entering every semester. Data were collected electronically pre-intervention (T1), directly post-intervention (T2), and at 12-month follow-up (T3) in 2017. Teachers answered questionnaires about each child at all three time points. Participants could withdraw from the study at any time. For more details regarding the effectiveness study, see Patras et al. (2016).

Participants

Children between the ages of 8–12 years ($N = 7,322$) who considered themselves to be more sad or anxious than their peers were invited to participate in the screening phase. Children who returned an informed consent form ($N = 1,692$) were assessed for self-reported anxiety and depressive symptoms. Children who reported one standard deviation (SD) or more above the population mean on anxiety and/or depression were invited to participate in the study ($N = 873$). Population means were based on results from national and international studies for the relevant age groups (Angold et al., 2002; Ólason et al., 2004; Rhew et al., 2010).

Seven children who, for different reasons, were not expected to benefit from the intervention (e.g., developmental delays, autism, severe behavioral disturbance), were excluded. Due to lack of sufficient number of group leaders to implement the intervention, 71 children were excluded from the intervention condition; 74 children (67 intervention and 7 control) withdrew before the intervention started. In total, 688 children, for whom corresponding teacher-reports were also available, were enrolled in the current study (57.9% girls); 269 received the intervention and 419 constituted the control group. Both the control and intervention schools were given half-day seminars, during their working hours, designed to increase knowledge of internalizing symptoms in children and how teachers could support these children.

Grade level was used as a proxy for age; third to sixth grade represented 8–12 years of age. Approximately 4.4% of the participating children were in the third grade, 38.2% in the fourth grade, 45.6% in the fifth grade, and 11.8% in the sixth grade. Most of the children lived with both of their parents (71%). The majority of families had average to above-average income levels (82%) (Statistics-Norway, 2019b) and reported higher education levels than the national average in Norway (i.e., 67% with a college or university education). Comparatively, the corresponding education level in the general Norwegian population is approximately 33% (Statistics-Norway, 2019a).

Intervention

The EMOTION: “Coping Kids” Managing Anxiety and Depression intervention is an indicated prevention program developed to reduce anxiety and depressive symptoms (transdiagnostic) in children and is implemented in groups in a school setting. The program is manual-based and integrates core components of empirically supported treatments for anxiety (the Coping Cat program; (Kendall et al., 2006)) and depression (Action; (Stark et al., 2007)) in children.

The intervention is CBT-based, includes 20 group meetings, and focuses on teaching children coping skills and strategies to deal with difficult thoughts, feelings, and situations. The first ten sessions focus on psychoeducation, including strategies to regulate mood, problem-solving skills, and understanding feelings and bodily reactions. The next ten sessions focus on building a positive self-schema, cognitive restructuring, working with behavioral activation targeting depressive symptoms (e.g., making activity plans, talking with peers), and graded exposure to fear-inducing situations for anxious children. Additionally, parents meet in groups seven times, four of which are together with their child. The corresponding parent meetings are intended to increased support for their children. Individual aims related to the child’s daily life, at school, at home, and during leisure activities, are decided for each child in the first joint meeting and continually revised together with parents and children.

In the present study, two trained group leaders from primary or secondary health services delivered the EMOTION program in groups of three to seven children, twice a week for ten weeks (45–60 min each session). The same group leaders also led the parent groups. Group leaders participated in a three-day training seminar, covering basic CBT principles and the EMOTION manual. Additionally, trained CBT therapists provided weekly supervision to the group leaders during the intervention period. Of the total number of sessions, 20% were randomly chosen to be videorecorded, due to both organizational reasons and security reasons. Fidelity to the intervention was assessed by scoring 239 observations, which corresponded to 17% of the sessions, using the Competence and Adherence Scale for Cognitive Behavioral Therapy (CAS-CBT); (Bjaastad et al., 2015), and was found to be good overall (Rasmussen et al., 2021). The remaining 3% of videorecords could not be rated due to the limited quality of the recordings (e.g., sound problems, zoom not correct, or incomplete recording).

Measures

Teachers rated *academic achievement* and *school adaptation* on an adapted version of two factors from the Teacher’s Report Form (TRF). The TRF is a component of the Achenbach System of Empirically Based Assessment – ASEBA (Achenbach & Rescorla, 2001), investigating students’ problem areas, academic performance, and adaptive functioning at school. Norwegian elementary school students (8–12 years old) do not have exams or grades. Evaluating and following-up on students is part of teachers’ regular work; therefore, teachers’ subjective evaluations, as assessed by the TRF, were used.

Academic achievement was thus assessed by teachers’ evaluation of children’s performance in Norwegian, English, Mathematics, and Social Studies rated on a scale from 1 (*far below mean*) to 5 (*far above mean*), as compared to children of the same age. A mean item score was calculated based on the teachers’ answers for all four subjects, representing the academic achievement scale.

School adaptation was evaluated by teachers assessing the children’s work effort, behavior, learning skills, and mood on a scale from 1 (*far below mean*) to 5 (*far above mean*). A mean score was calculated based on the teachers’ answers for all four characteristics, representing the school adaptation scale.

The ASEBA system has shown good psychometric properties and has been supported by research for decades (Achenbach & Rescorla, 2001; Rescorla et al., 2007). Previous studies on the Norwegian version of the TRF have shown good to excellent internal consistency; however, test-

retest reliability and inter-rater reliability have not been documented (Kornør & Drugli, 2011). In the present study, internal consistency at baseline was excellent for the academic achievement scale (Cronbach's alpha = 0.90) and satisfactory for the school adaptation scale (Cronbach's alpha = 0.72).

Anxiety symptoms were assessed using the Multidimensional Anxiety Scale for Children – MASC-C (March et al., 1997), a 39-item self-report scale designed for children and adolescents between 8 and 19 years old. Children rated each question on a scale ranging from 0 to 3 (0 = *never true*, 1 = *rarely true*, 2 = *sometimes true*, 3 = *often true*), based on their experiences in the past two weeks. A total sum score was calculated and used in the present study.

The MASC-C has shown high retest reliability (March et al., 1997, 1999) and favorable psychometric properties in a Norwegian sample (Villabø et al., 2012). The internal consistency of self-reported anxiety symptoms at baseline in the present study was good (Cronbach's alpha = 0.84).

Depressive symptoms were assessed by the children, using the Mood and Feelings Questionnaire-short version – SMFQ (Angold et al., 1995), which comprises 13 items and assesses cognitive, affective, and behavioral symptoms of depression during the last two weeks in children 8–18 years old. Symptoms are rated on a scale ranging from 0 to 2 (0 = *not true*, 1 = *sometimes true*, 2 = *true*). A total sum score was calculated and used in the present study.

Previous studies indicated good psychometric properties for the Norwegian-version SMFQ (Larsson et al., 2016; Richter & Sund, 2013). In the current study, internal consistency of self-reported depressive symptoms at baseline was good (Cronbach's alpha = 0.80).

Statistical Analysis

We compared the intervention and control groups at baseline regarding teacher-reported academic achievement and school adaptation and child-rated symptoms of anxiety and/or depression. The children were also grouped based on symptom presentation: anxiety symptoms only, depressive symptoms only, or combined symptoms (anxiety and depression). Possible differences based on grade level (age) and gender were examined using Student's *t*-test, linear-by-linear test for association, or Pearson's chi-squared test, as appropriate.

We used linear mixed model analyses with academic achievement and school adaptation as dependent variables. We included child as a random factor, and intervention group, time, and their interaction as fixed factors, adjusting for gender and grade level. The three timepoints were baseline (T1), post-intervention (T2), and 12-month follow-up (T3). We also conducted the analyses separately for the subgroups defined by the symptom profile: anxiety symptoms only, depressive symptoms only, and combined symptoms.

Statistical significance was set at $p < 0.05$, and 95% confidence intervals (CI) were reported where relevant. Statistical analyses were conducted using SPSS v26.

Results

The baseline characteristics of the total sample and the intervention and control groups are presented in Table 1, and for the subgroups in Table 2. At baseline, the intervention group scored significantly higher than the control group on anxiety and depressive symptoms (Table 1). For the dependent variables (academic achievement and school adaptation), there were no group differences at baseline. When divided by subgroups, there were significant differences in school adaptation for the anxiety-only subgroup; the intervention group scored lower than the control group (Table 2). There were also significant differences for the depression-only subgroup; the intervention group scored higher than the control group on school adaptation.

Of the 688 cases included in the sample at baseline, 627 yielded data for academic achievement and school adaptation at one or more timepoints. Among those, 29 had data only at baseline and post-intervention, 6 had data only at baseline, and 26 had data only at baseline and the 12-month follow-up.

Table 1. Descriptive statistics for all participants at baseline.

	All (<i>N</i> = 688)	Intervention condition (<i>n</i> = 269)	Control condition (<i>n</i> = 419)	Differences between conditions; <i>p</i> -value
Academic achievement (T) ¹	2.96 (0.83)	2.997 (0.825)	2.968 (0.807)	0.649 ^{a)}
School adaptation (T) ¹	3.03 (0.62)	3.0362 (0.617)	3.051 (0.598)	0.760 ^{a)}
Anxiety symptoms (S) ²	63.60 (13.60)	65.67 (13.22)	62.37 (13.53)	0.002 ^{a)}
Depressive symptoms (S) ²	9.92 (4.89)	10.53 (5.29)	9.43 (4.56)	0.005 ^{a)}
Grade level (age)				
3rd	30 (4.36%)	12 (4.5%)	18 (4.3%)	0.554 ^{c)}
4th	263 (38.23%)	103 (38.3%)	160 (38.2%)	
5th	314 (45.64%)	116 (43.1%)	198 (47.3%)	
6th	81 (11.77%)	38 (14.1%)	43 (10.3%)	
Gender (female)	398 (57.85%)	170 (63.2%)	228 (54.4%)	0.023 ^{b)}

Note: Mean (SD) or *n* (%). *N* = 688. Academic achievement = TRF (Range 4–20); School adaptation = TRF (Range 5–20); Anxiety symptoms = MASC-C (Range 0–105); Depressive symptoms = SMFQ (Range 0–26); (T) = Teacher rated; (S) = Self-report; ¹ High value indicate good performance; ² Higher values indicate more problems or symptoms; ^{a)} Student's *t*-test; ^{b)} Pearson's chi-square test; ^{c)} Linear-by-linear association.

Table 2. Descriptive statistics for subgroups at baseline.

	Intervention condition	Control condition	Differences between conditions. <i>p</i> -value ^{a)}
<i>Anxiety symptoms only:</i>	<i>n</i> = 49	<i>n</i> = 94	
Academic achievement (T) ¹	2.98 (0.73)	3.22 (0.82)	0.092
School adaptation (T) ¹	3.00 (0.52)	3.24 (0.62)	0.024
<i>Depressive symptoms only:</i>	<i>n</i> = 67	<i>n</i> = 129	
Academic achievement (T) ¹	3.09 (0.84)	2.88 (0.77)	0.076
School adaptation (T) ¹	3.20 (0.67)	3.0 (0.56)	0.024
<i>Combined symptoms:</i>	<i>n</i> = 153	<i>n</i> = 196	
Academic achievement (T) ¹	2.96 (0.85)	2.91 (0.81)	0.548
School adaptation (T) ¹	2.98 (0.60)	3.0 (0.60)	0.736

Note: Mean (SD). Academic achievement = TRF (Range 4–20); School adaptation = TRF (Range 5–20); (T) = Teacher rated; ¹ High value indicate good performance; ^{a)} Student's *t*-test.

Table 3 show changes in academic achievement and school adaptation. There were no significant differences in changes from baseline to post-intervention between the intervention and control groups for academic achievement, difference $\Delta = -0.027$, 95% CI (-0.102 to 0.047), $p = 0.469$, or from baseline to 12-month follow-up, $\Delta = -0.074$, 95% CI (-0.148 to 0.0002), $p = 0.051$. There were no significant differences in changes from baseline to post-intervention between the intervention and control groups for school adaptation, difference $\Delta = 0.0499$, 95% CI (-0.0194 to 0.1193), $p = 0.158$, or from baseline to 12-month follow-up, $\Delta = 0.039$, 95% CI (-0.029 to 0.10287), $p = 0.266$.

Table 3. Mixed model analyses, with child as a random factor, and intervention group, time, and their interaction as fixed factors, adjusted for gender and grade level.

Time	Dependent variable	Intervention condition		Control condition		Difference from T1 (interaction between group and time)		<i>p</i> - value
		<i>n</i>	Mean* (SE)	<i>n</i>	Mean* (SE)	Estimate (95% CI)		
Baseline (T1)	Academic achievement	269	2.989 0.050	419	2.968 0.040			
	School adaptation	269	3.015 0.036	419	3.064 0.029			
Post-intervention (T2)	Academic achievement	260	3.004 0.050	396	3.015 0.040	-0.027 (-0.102 to 0.047)	0.469	
	School adaptation	260	3.068 0.037	396	3.067 0.029	0.0499 (-0.0194 to 0.1193)	0.158	
Follow-up at 12 months (T3)	Academic achievement	263	3.007 0.050	390	3.065 0.040	-0.074 (-0.148 to 0.0002)	0.051	
	School adaptation	263	3.115 0.037	390	3.125 0.030	0.039 (-0.0290 to 0.1087)	0.266	

Note: *Estimated marginal means and standard errors. Academic achievement and school adaptation – Teacher's Report Form (TRF).

Table 4. Anxiety-only subgroup ($n = 143$): Mixed model analyses, with child as a random factor, and intervention group, time, and their interaction as fixed factors, adjusted for gender and grade level.

Time	Dependent variable	Intervention condition $n = 49$			Control condition $n = 94$			Difference from T1 (interaction between group and time) Estimate (95% CI)	p - value
		n	Mean*	(SE)	n	Mean*	(SE)		
Baseline (T1)	Academic achievement	49	2.949	0.114	94	3.228	0.082		
	School adaptation	49	2.956	0.079	94	3.259	0.057		
Post-intervention (T2)	Academic achievement		2.952	0.114		3.232	0.083	-0.001365 (-0.158381 to 0.155650)	0.986
	School adaptation		3.048	0.080		3.275	0.058	0.071719 (-0.075212 to 0.228570)	0.321
Follow-up at 12 months (T3)	Academic achievement		2.891	0.114		3.259	0.082	-0.089379 (-0.245922 to 0.067165)	0.262
	School adaptation		3.075	0.080		3.307	0.058	0.071719 (-0.079724 to 0.223163)	0.352

Note: *Estimated marginal means and standard errors. Academic achievement and school adaptation – Teacher's Report Form (TRF).

Table 5. Depression-only subgroup ($n = 196$): Mixed model analyses, with child as a random factor, and intervention group, time, and their interaction as fixed factors, adjusted for gender and grade level.

Time	Dependent variable	Intervention condition $n = 67$			Control condition $n = 129$			Difference from T1 (interaction between group and time) Estimate (95% CI)	p - value
		n	Mean*	(SE)	n	Mean*	(SE)		
Baseline (T1)	Academic achievement	67	3.091	0.097	129	2.883	0.070		
	School adaptation	67	3.184	0.073	129	3.004	0.053		
Post-intervention (T2)	Academic achievement		3.103	0.098		2.988	0.071	-0.092647 (-0.246887 to 0.061594)	0.238
	School adaptation		3.204	0.074		3.040	0.053	-0.016693 (-0.156224 to 0.122839)	0.814
Follow-up at 12 months (T3)	Academic achievement		3.007	0.098		3.057	0.071	-0.257625 (-0.413412 to -0.101839)	0.001
	School adaptation		3.183	0.074		3.076	0.054	-0.074395 (-0.215295 to 0.066506)	0.300

Note: *Estimated marginal means and standard errors. Academic achievement and school adaptation – Teacher's Report Form (TRF).

Table 6. Combined subgroup ($n = 349$): Mixed model analyses, with child as a random factor, and intervention group, time, and their interaction as fixed factors, adjusted for gender and grade level.

Time	Dependent variable	Intervention condition $n = 153$			Control condition $n = 196$			Difference from T1 (interaction between group and time) Estimate (95% CI)	p - value
		n	Mean*	(SE)	n	Mean*	(SE)		
Baseline (T1)	Academic achievement	153	2.956	0.067	196	2.909	0.059		
	School adaptation	153	2.960	0.048	196	3.008	0.043		
Post-intervention (T2)	Academic achievement		2.975	0.067		2.931	0.059	-0.001463 (-0.101603 to 0.098676)	0.977
	School adaptation		3.015	0.049		2.984	0.043	0.078359 (-0.016495 to 0.173213)	0.105
Follow-up at 12 months (T3)	Academic achievement		3.041	0.067		2.978	0.059	0.016079 (-0.083696 to 0.115855)	0.752
	School adaptation		3.099	0.048		3.068	0.043	0.078369 (-0.016148 to 0.172887)	0.104

Note: *Estimated marginal means and standard errors. Academic achievement and school adaptation – Teacher's Report Form (TRF).

Tables 4–6 show the separate analyses for the subgroups defined by symptom profile: anxiety-only ($n = 143$), depression-only ($n = 196$), and combined ($n = 349$). There were no significant differences regarding academic achievement and school adaptation, from baseline to post-intervention or baseline to 12-month follow-up, between the intervention and control groups for the anxiety-only (Table 4) and combined subgroups (Table 6). For the depression-only subgroup, there were no significant differences from baseline to post-intervention for either academic achievement or school adaptation. However, the depression-only subgroup did show significant improvement for academic achievement in the control group from baseline to 12-month follow-up, difference $\Delta = -0.258$, 95% CI (-0.413 to -0.102), $p = 0.001$ (Table 5). There were no long-term significant differences for school adaptation.

Discussion

The main results indicated no significant positive effects on academic achievement or school adaptation after participating in the EMOTION intervention. Furthermore, when looking closer at the different subgroups (anxiety-only, depression-only, and combined), results showed no significant improvements in academic achievement or school adaptation post-intervention or at 12-month follow-up.

The children participating in the present study had higher levels of self-reported anxiety than those in studies with a comparable age range, both in a Norwegian clinical sample (Villabø et al., 2013) and a sample referred to clinics for anxiety (Villabø et al., 2012). Furthermore, children in the present study reported higher depressive symptoms than those in a large national population-based pooled sample of children aged 10–19 years (Larsson et al., 2016). Previous studies used the same anxiety or depression measures as in the current study (Angold et al., 1995; March et al., 1997). Hence, children in the present study represented an at-risk sample, exhibiting elevated levels of internalizing symptoms.

Nevertheless, since the participating children scored higher for anxiety and depression symptoms than the general population, one might expect correspondingly lower scores on academic achievement and school adaptation, as shown in previous studies (Bru et al., 2016; Gustafsson et al., 2010; Ogden & Hagen, 2014). However, the children's mean academic achievement score in the total sample was slightly lower than in a national population-based study of children aged 6–13 years (Larsson & Drugli, 2011), both assessed using the TRF (Achenbach & Rescorla, 2001). School adaptation indicated the same pattern (Larsson & Drugli, 2011). This suggests that even at these symptom levels, the children in our sample managed to uphold a certain academic standard. Although it was not accounted for in the current analyses, families in the present study had a high education level and above-average income, which could influence academic achievement (Statistics-Norway, 2019a, 2019b). Socioeconomic background is a strong predictor for successful learning and academic achievement (Backe-Hansen et al., 2014). Thus, resourceful and supportive families, often with higher education as in our sample, may buffer the otherwise negative effects of internalizing symptoms on school functioning.

Somewhat surprisingly, results from the current study showed no significant differences between the EMOTION and control groups on academic achievement or school adaptation from baseline to post-intervention or from baseline to 12-month follow-up. The lack of effect on school functioning in the current study contrasts with Kreuze et al.'s (2018) meta-analysis reporting that anxiety-focused CBT improved both short- and long-term general functioning, including school outcomes. Other studies have also demonstrated improvement in school performance post-intervention (Keogh et al., 2006; Nail et al., 2015; Weems et al., 2009). However, these interventions targeted older children or clinical samples. The lack of improvement reported in the present study might be due to the participating children's young age. Norwegian children do not receive grades or have annual standardized tests at school until they are 13–14 years of age; therefore, the demands from school might be lower compared to other countries. Norwegian schools have high levels of

autonomy in implementing curricula and assessments (Borgonovi et al., 2018); however, the national government plays a central role in ensuring minimum quality standards are met, including norms for academic achievement in all subjects. This means that children are compared to other children of the same age group across the country. Additionally, the Norwegian school system generally includes all children; therefore, the teachers aim to provide education adapted to meet the needs of each child (Overland, 2015). Norwegian teachers may be less attuned to academic achievement and school adaptation than they are to other potential challenges (e.g., children's well-being and social competence).

Results from the current study also showed that, when divided into subgroups, a small but significant long-term improvement was identified in the depression-only subgroup on academic achievement in the control group; children with only depressive symptoms in the control group showed improved academic achievement at 12-month follow-up as compared to the those who participated in the EMOTION intervention. This was an unexpected finding which is difficult to explain. The teachers' assessments of the children could have been influenced by being aware that these children were included in the study. At the control schools, the teachers might have made extra efforts and facilitated the school day for them. However, previous analysis in the EMOTION study including the same children as the current study, contradicts these findings (Pedersen et al., 2019). Teachers scored the participating children low on internalizing problems despite knowing they were included in the study based on their internalizing symptoms. Consequently, there was a strong association between teacher ratings of internalizing problems and children's school functioning. Thus, when teachers reported that children had emotional symptoms, they were also more likely to report that these children struggled at school (Pedersen et al., 2019).

As mentioned previously, the children who participated in the EMOTION intervention also reported reduced anxiety and depressive symptoms (Martinsen et al., 2019) and improved emotional regulation skills (Loevaas et al., 2019), quality of life, and self-esteem (Martinsen et al., 2021) compared to non-participating children. However, although the differences were significant, they were small. Hence, it may be less likely to expect changes in other secondary outcome measures, such as school functioning. This is supported by other studies indicating that small reductions in anxiety have no effect on academic performance (Skryabina et al., 2016). Nevertheless, reduced anxiety and depressive symptoms are still important to facilitating school functioning (Bos et al., 2006; Jozefiak et al., 2009; Thaulow & Jozefiak, 2012); thus, the intervention may have the potential to facilitate academic achievement and school adaptation over time.

To improve effectiveness for school outcomes, the EMOTION intervention might be tailored more toward components in anxiety or depressive symptoms specifically related to school functioning. Rodgers & Dunsmuir (2015) suggested that CBT interventions have several relevant components (e.g., coping and problem-solving strategies). One approach could be to focus specifically on school-related challenges using the components of the EMOTION intervention, such as handling difficult academic tasks to build problem-solving skills, addressing perceived school pressure when teaching children how to think realistically, offering more frequent feedback on children's coping skills, and helping children conduct class presentations. The inclusion of competence skills such as positive mental health in interventions for children with internalizing problems may also promote their learning potential (O'Connor et al., 2018).

A systematic review of mental health promotion and prevention in schools, indicated that effective interventions included characteristics such as teaching skills, linking mental health work with academic learning, and focusing on positive health (Weare & Nind, 2011). According to the findings in the review, integrating mental health issues in the school curriculum seemed to have a greater impact compared with focusing on specific issues. It was also more efficient with a robust targeted component for high-risk children. The EMOTION intervention conducted as part of this study did not directly include the teachers in the program; however, implementing this intervention within schools provided opportunities for closer collaboration between group leaders and teachers. Furthermore, including teachers more frequently during intervention implementation and showing

them how to support affected children and participate in exposure exercises, may help teachers reinforce the effects in a school setting.

Clinical studies including children with anxiety symptoms have shown parent-reported improvement in academic performance (Nail et al., 2015; Suveg et al., 2009; Wood, 2006). This suggests that our results may have been different if parents were included as informants for school functioning. Furthermore, one might assume that the children's perceived increased self-esteem could have a positive effect on their self-perception of academic achievement and school adaptation; thus, using the children as informants might have shown different results for school functioning. Self-perceived academic competence is important because it has been shown to be predictive of school dropouts (Quiroga et al., 2013). Nevertheless, a lack of improvement in teacher-rated school functioning is particularly notable, given that the children and their parents reported intervention effects in several other domains (Loevaas et al., 2019; Martinsen et al., 2019, 2021).

While previous studies have shown positive results for academic achievement, they were primarily conducted with adolescents whose problems might have reached a clinical range, with academic tasks that were likely more demanding compared to those experienced by the present sample. Adolescents are also more at risk for school absenteeism or missing important curricula due to internalizing problems (e.g., avoidance, reduced energy, decreased motivation). As the children in the present sample grow older, promoting well-being and coping skills may have a positive influence on a wider range of outcomes, including school functioning (Adi et al., 2007; Durlak et al., 2011).

Strengths and Limitations

The present study was part of a multi-site effectiveness study. The cRCT design and large, heterogeneous sample size, and the diversity among schools from rural, urban, and suburban communities were strengths of the study. Other strengths were the use of well-established measures to assess school functioning and internalizing symptoms and including teacher reports in an intervention study targeting both anxiety and depressive symptoms. The response rates from both children and teachers were also high.

However, there are some limitations. The self-selective nature of the indicated sample implies that it was not representative for the targeted child population. Thus, there might be children relevant for this study that were not included because they did not enroll. This may have led to a skewed socioeconomic level, due to parents' higher education and income compared to the general population.

Children aged 8–12 years do not take exams or receive grades in Norway, which could have provided a more objective assessment of academic achievement. Thus, since only teachers' subjective evaluations were available, academic tests administered by the research team would have allowed for a more objective assessment of the children's academic performance. Using additional school-related surveys or gathering information on school functioning from multiple informants, including children and parents, could have added important information and yielded different results. Furthermore, there were relatively few questions regarding academic achievement and school adaptation; thus, the TRF scales might not have been sensitive enough to detect small changes.

It was recommended that group sessions be planned with teachers to avoid children missing too many lessons; afterschool group sessions were recommended if possible. Unfortunately, there are no records of lessons missed. If too many school lessons were missed, academic achievement may have been negatively affected.

Another limitation was that there were no restrictions on what treatment, if any, the children in the control group received during the intervention period. Both parents and teachers were informed of the screening results and encouraged to seek help if they considered it necessary.

Ideally, more than 17% of the sessions should have been observed to ensure fidelity. However, due to practical reasons, this was not possible. Together with checklists that were completed for

each session by the group leaders and the standardized written materials that were provided, we still believe that the level of treatment integrity was satisfactory for a study conducted in municipal services (Perepletchikova et al., 2007).

Conclusion and Future Directions

Based on the current findings, the EMOTION intervention does not appear to impact academic achievement and school adaptation, as reported by teachers. The intervention, however, still provides children with different skills and strategies to deal with depressive or anxious feelings, which are useful in several life domains.

To increase children's school functioning, one approach could be to facilitate the use of the EMOTION intervention to address school-related challenges and goals more specifically. A separate module for teachers could also be designed and included in the intervention. For instance, teachers could be included through weekly teacher meetings or asked to participate as one of the two group leaders who run the intervention, to facilitate a greater focus on school-related tasks. Thus, more extensive collaboration with teachers with tailored and more comprehensive school measures and support when implementing the intervention could potentially produce a different outcome regarding school functioning.

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Author KM receives royalties from sales of the EMOTION manual. The other authors declare no competing interests.

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