

STUDY PROTOCOL

Open Access



Evaluation of a school-based depression prevention approach among adolescents with elevated depressive symptoms attending special education: study protocol of a cluster randomized controlled trial

Wendy C. H. Rongen^{1,2*}, Daan H. M. Creemers^{1,2}, Jan Spijker^{1,3}, Ad A. Vermulst² and Sanne P. A. Rasing^{1,2}

Abstract

Background Adolescents are at risk of developing depressive symptoms and suicidality. Those attending special education, because of cognitive, physical, behavioral, emotional or learning disabilities, form a particularly vulnerable subgroup concerning the development of depressive disorders. Despite the fact that school-based prevention programs effectively reduce the risk of developing a depressive disorder in adolescents, approximately 7% of Dutch adolescents attend special education and remain unreached. There is also a lack of knowledge about effectiveness of depression and suicide prevention in this group. This study aims to evaluate the effectiveness of the adapted indicated prevention program 'At Full Force – Special Needs Education' for adolescents attending special education presenting elevated depressive symptoms.

Methods We will perform a cluster randomized controlled trial (RCT) to test the effectiveness of an indicated prevention program 'At Full Force – Special Needs Education'. Participating schools will randomly be assigned to the intervention or control condition. A safety net consisting of gatekeepers will be realized at every school. Adolescents will be screened for depressive symptoms. Those with heightened levels of depressive symptoms can participate in the RCT. Participants in the intervention condition will receive a CBT-based prevention group training during school hours, comprising eight meetings of 45 min each. The training is a modified version of a previously studied training in general education called At Full Force (in Dutch: Op Volle Kracht). The control condition consists of care as usual. All participants and their parents will complete assessments at baseline, post-intervention and 6- and 12 months follow-up. At all times, adolescents will be guided to mental health care if necessary. The primary outcome will be depressive symptoms. Secondary outcomes will be suicidality, anxiety and somatic symptoms. Additional exploratory analyzes will be conducted.

Discussion Adolescents in special education usually encounter numerous challenges. Adolescents participating in the preventive training are expected to show lower levels of depressive symptoms at follow-up compared to the control condition. Depression prevention can favorably impact pre-existing psychopathology trajectories and can avert additional life challenges associated with depression.

*Correspondence:

Wendy C. H. Rongen
wendy.rongen@ru.nl

Full list of author information is available at the end of the article



© The Author(s) 2025. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

Trial registration Clinicaltrials.gov NCT06203899 on January 2nd 2024.

Protocol Version: May 6th 2025 (v2.1).

Keywords Prevention, Depression, Adolescents, School-based, Special Needs Education

Background

Depression is a major health concern among adolescents worldwide [1]. In the Netherlands, the life-time prevalence of mood disorders is 15.5% at the age of 19 [2]. Depressive disorders tend to show high recurrence and chronicity [3]. Moreover, 17–21% of Dutch adolescents aged 16 to 25 report subclinical depressive symptoms [4]. Depressive symptomatology is associated with consequences such as difficulties in school and with peers, negative outcomes in family functioning, comorbid psychiatric disorders and a higher rate of self-harm and suicidality [5–7]. Depressive symptoms often stay unrecognized and thus untreated [8]. It is difficult for supporting adults to recognize depressive symptoms, let alone to address them in a conversation [9]. It is also difficult for adolescents to seek help due to limited mental health knowledge, stigma, and perception of professional help [10]. Of those with a diagnosable depression, only 15–36% receives treatment (i.e. had sought help) [11]. Evidently, prevention programs for adolescents are needed.

The majority of depression prevention programs for adolescents are school-based, while most of the adolescents can be reached at school. In most initiatives however, special education is left out [12, 13]. Special education admits adolescents who need additional help during education due to various reasons, such as cognitive, physical, behavioral, emotional or learning disabilities which make it impossible for them to benefit from the general educational system. In Europe, 0.1 to 5.8% of all children and adolescents attend special schools [90], with substantial variations between countries due to variation in policies. In the Netherlands, 3.9% of all adolescents attends special secondary education (in Dutch: Voortgezet Speciaal Onderwijs; VSO), which encompasses having a physical, cognitive, behavioral or emotional condition (however it is not mandatory to have a set diagnosis). Another 3.1% of Dutch adolescents attends a specific type of vocational education (practical prevocational education with learning support, in Dutch: Praktijkonderwijs; PrO), which has inclusion criteria on intelligence (TIQ 55–80) and learning disability (≥ 3 years delay). In the current study, we will speak of adolescents in special education while referring to students of VSO and PrO.

Adolescents attending special education are more vulnerable for developing depressive symptoms [14, 15]. A

possible explanation can be found in the diathesis-stress model. Whether an individual develops depressive symptoms depends on a complex combination of vulnerability (diathesis) and current life-stressors. Factors such as genetics, neurological functioning, psychiatric disorders, dysfunctional coping-styles and interpersonal factors define ones vulnerability [16]. Based on this model, adolescents attending special schools form a particularly exposed subgroup.

First, many adolescents attending special education have (symptoms of) psychiatric disorders [17]. There is a strong relationship between developmental or psychiatric disorders (i.e. autism, ADHD or CD/ODD) and a higher risk for depressive symptoms, depressive disorders and suicidality [18–25]. Second, children attending special education report more adverse childhood experiences (ACEs) [26, 27], which is a strong risk factor for depression as well [28]. Third, adolescents in special or practical education often have intellectual disabilities (ID). Among ID-adolescents, the prevalence of comorbid psychological problems is higher [29], worrisome risk factors such as ACEs or living in stressful circumstances are more common [30], and self-esteem, problem solving skills and a positive outlook on the future are low because adolescents experience many failures and disappointments in life [31, 32]. Unfortunately, prevalence studies on depressive symptoms in adolescents with ID are scarce [33]. Fourth, adolescents attending special needs education commonly feel different from peers, experience stigmatization and develop negative cognitive styles [15, 34]. They are more likely to get victimized and bullied in comparison to peers [35]. Among Dutch adolescents who died by suicide, a subgroup that got transferred to special education prior to their suicide is detected, according to findings of a psychological autopsy study [36]. This again indicates the vulnerability of adolescents in or transferred towards special education.

In this group, depressive symptoms can often go unnoticed. Adolescents in general are often hesitant to ask for help, as mentioned above [11] and adolescents in special education might be even more reluctant to discuss depressive symptoms, since they already feel stigmatized, overwhelmed or burdened [15, 32]. The next difficulty is the overlap in symptomatology of certain disorders and depressive symptomatology, resulting in diagnostic overshadowing (e.g. ADHD behavior tends to overshadow internalizing problems [37], or autism shows a

more atypical presentation of (depressive) feelings [38]). Depressive symptoms in adolescents often are expressed as somatic symptoms [39, 40]. Besides, having a developmental disorder hinders verbalizing depressive symptoms [37] and questionnaires are not always useable [41].

In order to help detect depressive symptoms and to prevent increase of symptoms in adolescents, school-based prevention is a good means. Multimodal approaches show the strongest results [12]. Most effective and most frequently used indicated strategies in prevention are school-based trainings based on therapies, such as Cognitive Behavioral Therapy (CBT) or Interpersonal Therapy [12, 42]. In the Netherlands, researchers have developed a school-based prevention approach, Strong Teens and Resilient Minds (STORM), which combines prevention components to form a multimodal program. It encompasses a gatekeeper training in which teachers gain knowledge and skill to identify and respond to adolescents with depressive symptoms or suicidality [9, 43]; universal early detection to identify adolescents at high-risk and to effectively refer them to mental health care [44, 45]; and an intervention that prevent deterioration of depressive symptoms. In the STORM program, Op Volle Kracht (OVK), which translates to 'At Full Force', is a CBT-based group training for schools modelled after the Penn Resiliency Program [46] and adapted for a Dutch context. The program appeared ineffective in universal and selective settings [47, 48], but it was effective in samples with elevated depressive symptoms [49, 50].

When developing prevention for adolescents in special education, alterations are needed. Looking at examples of modifications in the therapeutic field on depressive disorders in patients with special needs, research shows that modifying CBT—by simplifying language, reducing meta-cognitive techniques, increasing repetition, and adding more sessions—yields significant therapeutic effects [51–57]. Up to date, also several depression prevention programs have been developed specifically for ADHD populations (e.g. BEAMS [58] or MBCT [59]), autism populations (e.g. CBT-DAY [60] or RAP-A-ASD [61]), and ID populations (e.g. OVK-ID [34]). These programs provided tailored didactics, (e.g. repetition and visualization) and specified content (e.g. focus on social belongingness, recognition and regulation of emotions, and normalization of neurodiversity). Most programs differ in target populations and treatment-type, from multi model programs with individualized CBT and parent- and teacher sessions (e.g. RAP-ASD), to outpatient CBT-based group trainings for adolescents (e.g. CBT-DAY) or behavior and emotion regulation training for adolescents (e.g. BEAMS). Settings varied between school-based, in- and outpatient settings. Some prevention programs show modest effects on lowering depression symptomatology

(BEAMS, CBT-DAY, RAP-A-ASD). Others showed no significant effects on depressive symptoms (MBCT, OVK-ID). The programs without significant effects are both selective prevention programs, whereas those with moderate effects are indicated prevention programs.

The current study will evaluate the effectiveness of the indicated depression prevention program Op Volle Kracht (OVK), which has been modified for adolescents attending special needs education [At Full Force – Special Needs Education]. A cluster randomized controlled trial will be conducted with allocation at school-level. A gatekeepers' network is composed on each participating school and adolescents will be screened on depressive symptomatology and suicidality. In schools allocated in the intervention condition, adolescents with elevated depressive symptomatology will follow the indicated prevention program. This intervention is expected to be effective in reducing depressive symptoms in the intervention condition. It is expected to reduce suicidality, anxiety and somatic symptoms in the intervention condition as well. Additional exploratory analyzes will be conducted to find out whether adolescents with various psychopathologies benefit differently from the intervention, since effectiveness may vary due to the heterogeneity of the sample.

Methods

The study methods and results are reported in accordance with the SPIRIT 2013 statement for reporting study protocols on randomized trials [62]. The medical ethics committee METC Oost Nederland in The Netherlands approved this study (NL83816.091.23). The study is registered at Clinicaltrials.gov (NCT06203899) on January 2nd 2024. We expect to finish recruitment in April 2026.

Design

The study will be a cluster-randomized controlled trial with two conditions (intervention and control) to evaluate the effectiveness of an indicated prevention program for adolescents in special education. It is aimed at adolescents with elevated depressive symptoms. A safety network of gatekeepers will be implemented at each site. The control condition will consist of care as usual at school (e.g. monitoring talks with the teacher). Adolescents are offered to follow the program after finalizing the study, when it is proven to be effective. The intervention condition will consist of a CBT-based prevention program. Prior randomization will be conducted at school level, which minimizes a contamination effect among the participants and intervention trainers. An independent statistician will randomly assign the schools to a condition. The randomization will be stratified for school type. Schools with students with learning or intellectual

disabilities (VSO cluster 3), severe behavioral or psychiatric disabilities (VSO cluster 4), and learning delay and mild intellectual disabilities (PrO practical prevocational education with learning support) will participate. The study procedure is visualized in Fig. 1.

Participants' eligibility

Adolescents with elevated depressive symptoms are eligible for this study. Inclusion criteria are an elevated level of depressive symptoms on a screening measure (≥ 14 in the Children's Depression Inventory-2 [63]); being in their second or third year of special secondary education

or reaching the age of 14 or 15 in the current academic year (the latter only when a school does not use grade levels); and sufficient knowledge of the Dutch language. Exclusion criteria are the absence of parental permission; already undergoing a treatment for mood problems; the presence of active suicidal ideation, plans or gestures, or a clinical depression. Exclusion based on ongoing or required treatment for mood problems is assessed during a recruitment phone call with parents, prior to inclusion. Clinical depression is further evaluated during the baseline assessment using the ADIS-C clinical interview. When indicated, based on clinical depressive outcomes

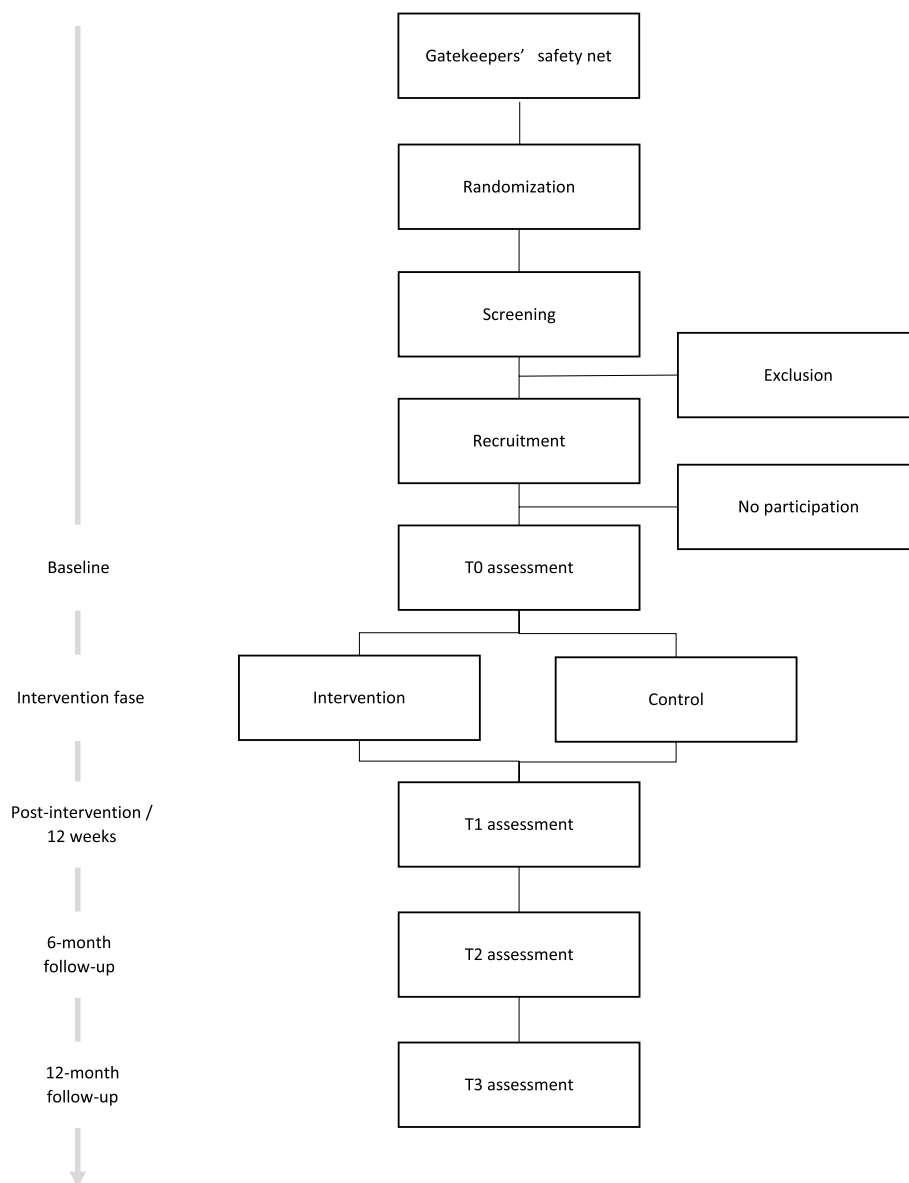


Fig. 1 Study procedure

stated by the adolescent, appropriate referral to mental health services is facilitated.

Recruitment

Adolescents will receive verbal and written information about the screening assessment from a research employee and the teacher, which is done in small groups during school hours. Parents will also receive verbal and written information at parent information sessions. After receiving digital consent, the adolescents will be screened for depressive symptoms. Adolescents who meet the inclusion criteria, and their parents, will receive verbal and written information about the study: Adolescents will be individually recruited at school by a research employee. Parents will be telephoned after they have received a letter about the study, to talk through any questions and/or hesitations. Digital informed consent will be obtained.

Sample size

To answer the main question on whether the reduction of depressive symptoms is stronger in the experimental versus the control group, Latent Growth Curve analysis will be used (LGCA). Prospective sample size calculations for LGCA were done with a Monte Carlo study [64], assuming type I error of 0.05, power of 0.80, and a medium effect size (the latter based on Wijnhoven, Creemers [49], de Jonge-Heesen, Rasing [50]). A latent growth curve model was defined with four time points, group membership as covariate, and missing values estimated at 0% at baseline, 10% at post-measurement, 10% at 6-month follow-up and 10% at 12-month follow-up, based on Wijnhoven, Creemers [49]. This resulted in a minimum sample size of 170 participants. Then, potential loss of power because of data clustering was dealt with, considering that the intervention will take place in small groups of $n=3$ and an ICC of 0.07 based on Wijnhoven, Creemers [49]. This resulted in a Variance Inflation Factor (VIF [65]) equaled 1.21, indicating that the sample size had to be increased to $1.21 * 170 = 206$. We lastly increased the sample size by 15% to compensate for potential loss of power due to drop-out, resulting in 236 participants (118 in each condition). To be able to reach 236 participants, we need to screen 1400 adolescents: an estimated 25% of all adolescents are possibly experiencing depressive symptoms (4) and, however participation rates reached over 85% in prior school-based depression prevention studies, we will consider a more conservative participation rate of 70% [49, 66, 67].

The intervention

The intervention in this study, At Full Force – Special Needs Educational, is altered for adolescents in special needs education, based on the eponymous program for

adolescents attending general education [50]. The intervention is based on cognitive behavioral therapy (CBT) and consists of 8 lessons of 45 min each, plus one short follow-up contact each week. It will take place at school during school hours and groups consist of 3–5 adolescents. A trained psychologist of the school staff will facilitate the training together with a trained psychologist of the research team. Each lesson has a set structure and a specific content, which is shown in Table 1. Each lesson and follow-up contact includes filling in a mood chart, which enables participants to reflect on mood as a changeable thing. To conclude, lessons include one or two homework assignments, in which they are challenged to engage in positive activities, to write down a situation in which they experience a negative feeling that week, or to formulate compliments for each group member. In cases where fewer than three participants are present, sessions will proceed with two members. Groups within each site will not be merged, as doing so may compromise participants' sense of safety and introduce excessive change. Intervention fidelity will be monitored through a fidelity log completed after each session, with notes documenting any adaptations. Despite the fact that the active component of peer learning may be reduced to some extent, trainers consistently integrate relevant examples of negative and positive thinking. Moreover, a significant part of the intervention relies on knowledge dissemination and repetition.

As mentioned, alterations were made to an existing intervention. This was done after expert interviews and focus groups, following the steps of Intervention Mapping [68]. Alterations were made on didactic levels (e.g. group size, simplified instructions, visual aids and repetition) and on content level (e.g. less focus on meta-cognition, and more time spent on recognizing emotions, how to formulate positive thoughts in real life, and learning through experience). Cultural sensitivity was considered important, particularly for schools with a higher proportion of students from immigrant backgrounds. Intervention materials were adapted accordingly—for example, by incorporating racial diversity—to ensure relevance, especially for students with cognitive impairments or autism who may struggle to relate to abstract or culturally distant examples. Language adaptations focused primarily on simplifying content to accommodate the target subgroup. As all participants are proficient in Dutch and enrolled in Dutch-language education, no translation was necessary.

Gatekeeper training

At each site, teachers, school psychologists and school support workers will be educated on how to recognize depressive symptoms and suicidality in adolescents.

Table 1 Lesson content of Op Volle Kracht

No	Content
1	- Participants get acquainted with each other - Learn about the training set-up and about depressive feelings
2	- Learn about emotions and how to recognize them
3	- Relationship between activating events, beliefs and emotional consequences - Optimistic and pessimistic beliefs and their role in emotional consequences - Recognizing pessimistic beliefs
4	- Investigate thoughts - Find evidence to substantiate and refute thoughts - Swiftly formulate optimistic thoughts in real life (game)
5	- Find evidence to substantiate and refute thoughts - Swiftly formulate optimistic thoughts in real life (game)
6	- Investigate thoughts by asking 'Whats next?' and fantasizing the worst case scenarios of thoughts - Learn to make an action plan to prevent that worst case from happening - Swiftly formulate optimistic thoughts in real life (game)
7	- Learn how to change behavior to receive an (unexpected) positive result - Learn that therefore, pessimistic thoughts are not always true
8	- Summarize Op Volle Kracht - Quiz and certificate
a	- After 1 month: Summarize and reflect on Op Volle Kracht
b	- Each week: Follow-up contact to work on mood chart and the 'homework' assignment(s)

In this so called gatekeeper training [69], they learn and practice how to address difficult topics in a conversation, especially suicidality (suicidal thoughts, ideations, plans, previous attempts). This creates a safety network around adolescents. Besides, it enables and supports redirection to mental health care when deemed necessary. The training will be facilitated by experienced psychologists.

Assessments

For an overview of all outcome measures, see Table 2. Assessments will be done at screening, baseline, post-intervention, 6-months follow-up and 12 months follow-up. Assessments are completed during school hours and are done by a trained research employee. The capabilities of each adolescent will be accounted for. At T2 and T3 adolescents receive a small monetary reward. Assessments by parents will be completed online. Adolescents who report suicidality during any assessment, are spoken

Table 2 Overview of study outcome measures

Variable	Instrument	SCR	T0	T1	T2	T3
Depression	Childrens Depression Inventory – Self report (CDI-2)	X	X	X	X	X
	Childrens Depression Inventory – Parent report (CDI-2-P)		X	X	X	X
Suicidality	Vragenlijst over Zelfdoding en Zelfbeschadiging –screening (VOZZ-screen)	X	X	X	X	X
Clinical depression	Anxiety Disorder Interview Schedule-Children (depression section)		X		X	
Anxiety	Revised Child Anxiety and Depression Scale-25 (RCADS-25) (items on anxiety)		X	X	X	X
	RCADS-25-Parent (RCADS-25-P) (items on anxiety)		X	X	X	X
Somatic	Somatic Complaint List (SCL)		X	X	X	X
Demo-graphic	Age	X	X			
	Sex	X				
	Marital status parents	X				
	Previous or current psychological help	X	X			X
	Educational history	X				
	Reason for special education and/or diagnosis	X				
	Intelligence level	X				

SCR Screening, T0 Baseline, T1 After intervention/after 12 weeks, T2 Six months after T1, T3 Twelve months after T1

to within 48 h by a trained psychologist. Symptom severity will be evaluated and parents will be informed in all instances. When suicidality is acute and treatment is needed (e.g. active suicidal plans), adolescents and their parents will be referred towards mental health care and will be excluded from participation in this study. A data management plan is available. There is an insurance covering possible harm.

Screening measures

Depressive symptoms and suicidality will be screened to assess eligibility. Depressive symptoms will be measured using the Children's Depression Inventory 2 (CDI-2; [63, 70]). Suicidality will be measured with the Vragenlijst over Zelfdoding en Zelfbeschadiging – screen (VOZZ-Screen; [71]). Participants are asked about demographics, parental marital status and whether they currently receive mental health care. Schools are asked to report each participant's reason for attending special education (diagnosis and/or other problems), their time in special education, and the total IQ-score (if available).

Primary outcome measure

Depressive symptoms in adolescents will be measured with the CDI-2 (63, 70). The CDI-2 contains 28 items, each consisting of three statements graded in severity from 0 to 2. This instrument has good internal consistency, test–retest reliability and construct and discriminant validity [72]. One question concerns suicidality. The use of the CDI-2 for screening purposes is in accordance with the Dutch multidisciplinary guidelines for depression among youth [73].

Secondary outcome measures

The presence of a clinical depression will be measured by a semi-structured interview, the Anxiety Disorder Interview Schedule-Children (ADIS-C; [74]). We will only use the section of affective disorders. The purpose is to examine whether adolescents meet the criteria of a depression. If so, the severity of the depression will be determined. Those with moderate–severe depression will be excluded from the study and advised towards mental health care. The ADIS-C has good test–retest reliability [75].

Suicidality will be measured with the VOZZ-Screen [71]. This questionnaire contains 10 questions regarding thoughts and actions about life, self-harm and suicide. Items are rated on a 5-point scale. Internal consistency and test–retest reliability are high, and construct and discriminant validity are good [76].

Parent-reported depressive symptoms are measured with the CDI-2 parent-report questionnaire consisting of 17 items. The presence of each symptom in the past two weeks is indicated on a 4-point-scale [63, 70]. The

questionnaire has good internal consistency and construct validity, as well as a moderate positive correlation between the parent and child scale indicating good convergent validity [72].

Anxiety symptoms are measured by using the Revised Child Anxiety and Depression Scale (RCADS-25) self-report questionnaire and the RCADS-25-P parent questionnaire [77]. It is used in children 8 to 18 years old. Items are rated on an 4-point scale concerning prevalence. Only items concerning anxiety will be used; both parent and child anxiety scales have good internal consistency and test–retest reliability, construct and discriminant validity are good [78, 79].

Somatic symptoms will be measured via the Somatic Complaint List (SCL), which consists of 11 items about physical health. Items are rated on a 3-point scale including never, sometimes or often. It is validated for participants 8 years and older and internal consistency, test–retest reliability and construct validity are good [80].

Data analysis

The study variables are variables from well-known validated and reliable measuring instruments and can be considered as interval or continuous variables. Parametric statistical analysis techniques will be used for this type of data.

After screening, a number of participants with depressive symptoms will not participate in the study for several reasons. This attrition at screening through baseline will be analyzed with logistic regression analysis. Predictors are gender and depressive symptoms at screening, dependent variable is enrollment (the final group participating in this study). Attrition will also be analyzed with logistic regression for participants who drop out the study after start of the intervention, with dropout (yes, no) as dependent variable and condition (intervention or control), gender, school-type as predictors. For the latent growth curve analyses of primary and secondary outcome variables, missing data (dropout and incidental or intermittent missings) will be handled using the Full Information Maximum Likelihood estimator using all available information in the data [81, 82]. Prerequisite is that missing values are Missing At Random (MAR). There are no tests for MAR, but if Little's Missing Completely At Random (MCAR) test supports MCAR, then MAR is also supported [83].

Participants are nested within schools implicating that the data are to a certain degree dependent of schools. To correct for this dependency the procedure COMPLEX with the robust Maximum Likelihood estimator in Mplus will be used. It is possible that the number of schools turns out to be too small to apply the COMPLEX procedure. In that case effects of schools on the data will be

corrected by using dummy variables for schools as covariates [84].

Evaluation of outcomes

The data will be analyzed according to the intention-to-treat principle. The primary and secondary outcome variables will be analyzed with a Latent Growth Curve Analysis (LGCA) [85, 86]. Under the assumption of linearity between time and outcome variable two parameters of the growth model will be estimated: intercept i (estimated level of depressive symptoms at baseline) and slope s (change over time of depressive symptoms) using the statistical program Mplus version 7.2 [87]. The assumption of linearity has been supported by similar school-based studies [50], but will also be tested in this sample. Differences in growth parameters between the two groups will be tested by including condition (0=control, 1=intervention) as predictor of intercept and slope. The randomization was stratified per school-type, meaning we will have controlled for the presence of either intellectual disabilities (VSO-3), psychopathology or behavior- and emotional difficulties (VSO-4), or mild intellectual disabilities and learning delay (PrO). Therefore, each school type is represented equally in the intervention and the control group.

Additional exploratory analyzes are conducted to find out whether adolescents with different psychopathologies benefit differently from the intervention. The primary reason why adolescents are admitted to special education (i.e. diagnosis or other reason) will be used as predictor of the individual slopes. This variable is a nominal variable and will be recoded to dummy variables. Stratification based on specific diagnoses was deemed overly complex, as students in special education often belong to multiple diagnostic subgroups, resulting in subgroups too small for meaningful statistical analysis if all their diagnoses are taken into account.

Discussion

The present study protocol gives an overview of an RCT on the effectiveness of the indicated prevention program 'At Full Force – Special Needs Education' on depressive symptoms in adolescents in special education. Adolescents of special and practical education form a particularly vulnerable subgroup concerning the development of depressive disorders. They will usually experience (a combination of) developmental, educational, emotional or behavioral disorders, delays or problems. In the Netherlands, about 7% of all adolescents attends special education or practical education.

A cluster randomized controlled trial will be conducted with allocation at school-level. On each participating school, a network of gatekeepers is composed among

teachers, and adolescents will be screened on depressive symptomatology and suicidality. In schools allocated in the intervention condition, adolescents with elevated depressive symptomatology will follow the indicated prevention program, which has been modified for implementation in special schools. The primary aim is to investigate whether indicated prevention results in a significantly greater reduction in depressive symptoms and with that reduces the development of more serious depressive disorders 12 months after the intervention, compared to the control condition. The second aim is to evaluate the effectiveness of the program on suicidality, anxiety and somatic symptoms. Additional exploratory analyzes might clarify whether specific groups of adolescents benefit differently. Besides, the prevalence of depressive symptoms among adolescents in special education is rarely published. The current study offers an opportunity to present an overview of its prevalence in the Netherlands.

Strengths and limitations

One of the strengths of the study is that we target an evidently vulnerable group of adolescents for whom depressive symptoms easily remain unrecognized, are therefore withheld from prevention and are often not included in effectiveness trials. Second, we follow the line of previous effective school-based prevention programs, which show that indicated programs for adolescents with elevated depressive symptoms are most effective. Another strength is the between-school design, which minimizes contamination effects. Next, the multi-informant assessments (self-report, parent-report and interview) strengthen the design. Lastly, the indication of clinical depression via an interview at baseline not only facilitates adequate redirection to mental health care, but also ensures the RCT investigates the intervention effect in the desired population (before onset of depression).

Certain limitations of the study may be noted. The randomization is clustered at school-level and done before recruitment starts. This might lead to a participation bias. Second, the RCT will recruit adolescents with elevated depressive symptoms which might lead to stigmatization. However, it is expected that many adolescents in special education already receive some sort of support and feel less hindered to participate in an in-school program. Yet another important limitation of the study lies in the fact that the population of adolescents in special needs education is quite heterogeneous, meaning that their personal and psychiatric characteristics elicit different needs which perhaps cannot always be met in a (small-) group intervention. Although overarching challenging themes and didactic needs are addressed (themes: marginalization or exclusion [36], coping with (psychiatric)

difficulties [34], social belongingness and neurodivergence [60], and emotional difficulties [36, 38, 55, 57, 88, 89]; didactic needs: repetition, concrete instructions, visualization, processing time, focus on automatizing skill [34, 55, 58, 60, 61, 88]), outcomes on the entire subgroup should be interpreted with great caution. Exploratory analyses with the primary reason for special education placement and with the total number of disorders/reasons, will enrich the interpretation of the findings. Lastly, variation in training implementation across trainers and centers may introduce bias in outcomes. To mitigate this, all trainers have a university-level degree in (child) psychology, they complete a multi-day course on the intervention and maintain fidelity logs throughout the training. Furthermore, each training session will be co-facilitated by one of the three project trainers, helping to standardize delivery across sites. While schools may offer additional activities related to social-emotional development—an uncontrollable variable due to its integration in the standard curriculum—curriculum insights will be collected for each school. Also, statistical control procedures will be done to look into school differences.

Implications for practice

If the indicated prevention program effectively reduces depressive symptoms among adolescents in special education, it will positively affect the lives of these adolescents. Adolescents in special education usually encounter plenty of challenges in life. Preventing a depressive episode, might favorably affect the long-term trajectory of the adolescents' psychopathology. With schools being able to recognize depressive symptoms and suicidality and having an effective program for those with elevated depressive symptoms, implementation can be done on a larger scale. Hence, many adolescents in special education will be reached.

Abbreviations

ADIS-C	Anxiety disorders interview schedule for children
CBT	Cognitive behavioral therapy
CDI-2	Children's depression inventory 2
OVK	Op Volle Kracht
RCADS	Revised Children's Anxiety and Depression Scale
RCT	Randomized controlled trial
SCL	Somatic complaints list
VOZZ-screen	Vragenlijst over Zelfdoding en Zelfbeschadiging – screener

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12888-025-06955-5>.

Supplementary Material 1.

Acknowledgements

We would like to acknowledge Rian van den Boogaart (project manager at GGZ Oost Brabant) for her suggestion on practicability and realization of the study, Dewi Heijs (research assistant at GGZ Oost Brabant) for her assistance in the project, and Kim van Ettehoven (responsible for the previous development of Op Volle Kracht) for her insightful input on developing the intervention for the special educational sector. We are also grateful to the collaborating schools (Aventurijn Nijmegen, De Berkenschutse Heeze, De Hilt Helmond, De Korenaer Eindhoven, Helmond and Stevensbeek, Fioretti College Veghel, Het Brederocollege Breda, Het Hooghuis de Singel Oss, Het Aventurijncollege Bergen op Zoom, HUB Noord Brabant Oss and Veghel, Kentalis Kompas College Oss, Park Neerbosch, Nijmegen, PRO College Bemmel, Boxmeer, Nijmegen and Wijchen, Sonnewijser, Tiel and Oss, Sprongcollege Deurne).

Authors' contributions

WR is responsible for data collection, data analysis and for reporting the study results. AV supports in the data analysis. SR is grant applicant. SR, DC and JS are supervisors, read the manuscript and provide suggestions for improvement. All authors read and approved the final manuscript.

Funding

The scientific research on altering the STORM-approach to fit the special educational sector, including this RCT, is funded by the municipalities of Bernheze, Boekel, Land van Cuijk, Maashorst, Meierijstad and Oss, and by GGZ Oost Brabant.

Data availability

The dataset generated during the current study will not publicly be available due to the containing information that could compromise research participant privacy, but they are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

The medical ethics committee METC Oost-Nederland in the Netherlands (NL83816.091.23) and the Approval Committee of Scientific Research (Commissie Wetenschappelijk Onderzoek) at the Centre of Excellence for Youth Depression (CEYD) GGZ Oost Brabant approved this study. Written informed consent from adolescents and parents will be obtained.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

¹Behavioural Science Institute, Radboud University, Nijmegen, The Netherlands. ²Centre of Excellence for Youth Depression (CEYD) at GGZ Oost Brabant, Mental Health Care Institution, Oss, The Netherlands. ³Depression Expertise Center Pro, Persona Mental Health Care, Nijmegen, The Netherlands.

Received: 17 February 2025 Accepted: 9 May 2025

Published online: 22 May 2025

References

- Shorey S, Ng ED, Wong CHJ. Global prevalence of depression and elevated depressive symptoms among adolescents: A systematic review and meta-analysis. *Br J Clin Psychol*. 2022;61(2):287–305.
- Ormel J, Raven D, van Oort F, Hartman C, Reijneveld S, Veenstra R, et al. Mental health in Dutch adolescents: a TRAILS report on prevalence, severity, age of onset, continuity and co-morbidity of DSM disorders. *Psychol Med*. 2015;45(2):345–60.
- Johnson D, Dupuis G, Piche J, Clayborne Z, Colman I. Adult mental health outcomes of adolescent depression: A systematic review. *Depress Anxiety*. 2018;35(8):700–16.

4. Smit F, Vlasveld M, Beekman A, Cuijpers P, Schoevers R, Ruiter M, et al. *Depressiepreventie. Stand van zaken, nieuwe richtingen*. Utrecht: Trimbos Instituut, 2013 [Available from: [trimbos.nl/wp-content/uploads/sites/31/2021/09/af1258-depressiepreventie.pdf](https://www.trimbos.nl/wp-content/uploads/sites/31/2021/09/af1258-depressiepreventie.pdf)]
5. Carrellas NW, Biederman J, Uchida M. How prevalent and morbid are sub-threshold manifestations of major depression in adolescents? A literature review. *J Affect Disord*. 2017;210:166–73.
6. Bodden D, Stikkelbroek Y, Dirksen C. Societal burden of adolescent depression, an overview and cost-of-illness study. *J Affect Disord*. 2018;241:256–62.
7. Giletta M, Scholte RH, Engels RC, Ciairano S, Prinstein MJ. Adolescent non-suicidal self-injury: A cross-national study of community samples from Italy, the Netherlands and the United States. *Psychiatry Res*. 2012;197(1–2):66–72.
8. Beirão D, Monte H, Amaral M, Longras A, Matos C, Villas-Boas F. Depression in adolescence: a review. *Middle East current psychiatry*. 2020;27(1):50.
9. Terpstra S, Beekman A, Abbing J, Jaken S, Steendam M, Gilissen R. Suicide prevention gatekeeper training in the Netherlands improves gatekeepers' knowledge of suicide prevention and their confidence to discuss suicidality, an observational study. *BMC Public Health*. 2018;18(1):1–8.
10. Radez J, Reardon T, Creswell C, Lawrence PJ, Evdoka-Burton G, Waite P. Why do children and adolescents (not) seek and access professional help for their mental health problems? A systematic review of quantitative and qualitative studies. *Eur Child Adolesc Psychiatry*. 2021;30(2):183–211.
11. Eigenhuis E, Waumans RC, Muntingh ADT, Westerman MJ, van Meijel M, Batelaan NM, et al. Facilitating factors and barriers in help-seeking behaviour in adolescents and young adults with depressive symptoms: A qualitative study. *PLoS ONE*. 2021;16(3):e0247516.
12. Werner-Seidler A, Spanos S, Calear AL, Perry Y, Torok M, O'Dea B, et al. School-based depression and anxiety prevention programs: An updated systematic review and meta-analysis. *Clin Psychol Rev*. 2021;89:102079.
13. Werner-Seidler A, Perry Y, Calear AL, Newby JM, Christensen H. School-based depression and anxiety prevention programs for young people: A systematic review and meta-analysis. *Clin Psychol Rev*. 2017;51:30–47.
14. Girli A. An examination of the relationships between the social skill levels, self concepts and aggressive behavior of students with special needs in the process of inclusion education. *Cukurova University Faculty of Education Journal*. 2013;42(1):23–38.
15. Johnston L. Do Enrollment in Special Education and Having a Learning Disability Influence Symptoms of Depression in Young Adulthood? University of Hawaii; 2019 [thesis] [Available from: <http://hdl.handle.net/10125/63266>].
16. Hankin BL, Abela JR. Depression from childhood through adolescence and adulthood: a developmental vulnerability and stress perspective. In Hankin BL, Abela JR. (ed.). *Development of psychopathology: A vulnerability-stress perspective*. California: Sage publications, Inc. 2005 p. 245–288.
17. Hallahan DP, Pullen PC, Kauffman JM, Badar J. Exceptional learners. In Zhang L (Ed.), *Oxford Research Encyclopedia of Education*, New York, NY: Oxford University Press; 2020.
18. Hudson CC, Hall L, Harkness KL. Prevalence of depressive disorders in individuals with autism spectrum disorder: A meta-analysis. *J Abnorm Child Psychol*. 2019;47(1):165–75.
19. Hossain MM, Khan N, Sultana A, Ma P, McKyer ELJ, Ahmed HU, et al. Prevalence of comorbid psychiatric disorders among people with autism spectrum disorder: An umbrella review of systematic reviews and meta-analyses. *Psychiatry Res*. 2020;287:112922.
20. Wijnhoven LA, Creemers DH, Vermulst AA, Granic I. Prevalence and risk factors of anxiety in a clinical Dutch sample of children with an autism spectrum disorder. *Front Psych*. 2018;9:50.
21. Chen M-H, Pan T-L, Lan W-H, Hsu J-W, Huang K-L, Su T-P, et al. Risk of suicide attempts among adolescents and young adults with autism spectrum disorder: A nationwide longitudinal follow-up study. *J Clin Psychiatry*. 2017;78(9):1709.
22. Mitchell JT, Benson JW, Knouse LE, Kimbrel NA, Anastopoulos AD. Are negative automatic thoughts associated with ADHD in adulthood? *Cogn Ther Res*. 2013;37:851–9.
23. Meinzer MC, Pettit JW, Viswesvaran C. The co-occurrence of attention-deficit/hyperactivity disorder and unipolar depression in children and adolescents: a meta-analytic review. *Clin Psychol Rev*. 2014;34(8):595–607.
24. Simmons JA, Antshel KM, editors. *Bullying and depression in youth with ADHD: a systematic review*. Child & Youth Care Forum. 2021;50:379–414.
25. Burke JD, Romano-Verthelyi AM. *Oppositional defiant disorder. Developmental Pathways to Disruptive, Impulse-Control and Conduct Disorders*: Elsevier; 2018. p. 21–52.
26. de Berk A, Nelen W, Wassink-de Stigter R, Offerman E, Asselman M, Kooijmans R, et al. Ingrijpende Gebeurtenissen in het Onderwijs: Prevalentie van ACEs en PTSS-symptomen bij leerlingen in regulier basisonderwijs en (voortgezet) speciaal onderwijs. *Tijdschrift voor Orthopedagogiek*. 2021;4:49–56.
27. Offerman EC, Asselman MW, Bolling F, Helmond P, Stams G-JJ, Lindauer RJ. Prevalence of adverse childhood experiences in students with emotional and behavioral disorders in special education schools from a multi-informant perspective. *International journal of environmental research and public health*. 2022;19(6):3411.
28. Vink R, Pal S, Eekhout I, Pannebakker F, Mulder T. Ik heb al veel meegemaakt: Ingrijpende jeugdervaringen (ACE) bij leerlingen in groep 7/8 van het regulier basisonderwijs. 2016 [Available from: publications.tno.nl/publication/34622407/s2R4Uj/TNO-2016-R11157.pdf]
29. van den Bogaard M, Boven S, Berg M, van den Blokenhoeve J, Drost J. Cognitieve gedragstherapie bij jeugdigen met een licht verstandelijke beperking en een psychische stoornis [Cognitive Behavioral Therapy for adolescents with a mild intellectual disability and psychological disorder]. *Academische Werkplaats Kajak*; 2020 [Available from: kenniscentrumlvb.nl/product/handreiking-cognitieve-gedragstherapie-bij-jeugdigen-met-een-licht-verstandelijke-beperking-en-een-psychische-stoornis-2/]
30. Wigham S, Emerson E. Trauma and life events in adults with intellectual disability. *Curr Dev Disord Rep*. 2015;2(2):93–9.
31. Kenniscentrum KJP. *Suicidepreventie bij jongeren 2022* [Available from: <https://www.kenniscentrum-kjp.nl/professionals/dossiers/suicidepreventie-jongeren/>].
32. Mollison E, Chaplin E, Underwood L, McCarthy J. A review of risk factors associated with suicide in adults with intellectual disability. *Advances in Mental Health and Intellectual Disabilities*. 2014;8(5):302–8.
33. van den Hazel T, Didden R, Nijman H, de Beurs D. Suicide bij mensen met een lichte verstandelijke beperking. *Tijdschr Psychiatr*. 2020;62(12):1022–9.
34. Weeland MM, Nijhof KS. Cognitieve gedragstherapie voor depressieve klachten bij jongeren in residentiële zorg met een LVB in vergelijking met normaal begaafde jongeren: Een verkennende studie naar 'Op Volle Kracht'. *Pedagogiek*. 2019;39(2):225–46.
35. Saylor CF, Leach JB. Perceived bullying and social support in students accessing special inclusion programming. *J Dev Phys Disabil*. 2009;21(1):69–80.
36. Mérelle S, Van Bergen D, Looijmans M, Balt E, Rasing S, van Domburgh L, et al. A multi-method psychological autopsy study on youth suicides in the Netherlands in 2017: Feasibility, main outcomes, and recommendations. *PLoS ONE*. 2020;15(8):e0238031.
37. Fraser A, Cooper M, Agha SS, Collishaw S, Rice F, Thapar A, et al. The presentation of depression symptoms in attention-deficit/hyperactivity disorder: comparing child and parent reports. *Child Adolesc Mental Health*. 2018;23(3):243–50.
38. Magnuson KM, Constantino JN. Characterization of depression in children with autism spectrum disorders. *Journal of developmental and behavioral pediatrics*. JDBP. 2011;32(4):332.
39. Grigorian K, Östberg V, Raninen J, Ählén J, Läftman SB. Prospective associations between psychosomatic complaints in adolescence and depression and anxiety symptoms in young adulthood: a Swedish national cohort study. *SSM-Population Health*. 2023;24:101509.
40. Bekhuis E, Boschloo L, Rosmalen JG, Schoevers RA. Differential associations of specific depressive and anxiety disorders with somatic symptoms. *J Psychosom Res*. 2015;78(2):116–22.
41. Ludi E, Ballard ED, Greenbaum R, Pao M, Bridge J, Reynolds W, et al. Suicide risk in youth with intellectual disability: The challenges of screening. *Journal of developmental and behavioral pediatrics*. JDBP. 2012;33(5):431.
42. Hetrick SE, Cox GR, Witt KG, Bir JJ, Merry SN. Cognitive behavioural therapy (CBT), third-wave CBT and interpersonal therapy (IPT) based

- interventions for preventing depression in children and adolescents. Cochrane database of systematic reviews. 2016;8:CD003380.
43. Litteken C, Sale E. Long-term effectiveness of the question, persuade, refer (QPR) suicide prevention gatekeeper training program: Lessons from Missouri. *Community Ment Health J*. 2018;54:282–92.
 44. Beck A, LeBlanc JC, Morissette K, Hamel C, Skidmore B, Colquhoun H, et al. Screening for depression in children and adolescents: a protocol for a systematic review update. *Syst Rev*. 2021;10(1):1–13.
 45. Robinson J, Yuen HP, Martin C, Hughes A, Baksheev GN, Dodd S, et al. Does screening high school students for psychological distress, deliberate self-harm, or suicidal ideation cause distress—and is it acceptable? *Crisis*. 2011;32(5).
 46. Gillham JE, Reivich KJ, Freres DR, Chaplin TM, Shatté AJ, Samuels B, et al. School-based prevention of depressive symptoms: A randomized controlled study of the effectiveness and specificity of the Penn Resiliency Program. *J Consult Clin Psychol*. 2007;75(1):9.
 47. Kindt K, Kleinjan M, Janssens JM, Scholte RH. Evaluation of a school-based depression prevention program among adolescents from low-income areas: A randomized controlled effectiveness trial. *Int J Environ Res Public Health*. 2014;11(5):5273–93.
 48. Tak YR, Lichtwarck-Aschoff A, Gillham JE, Van Zundert RM, Engels RC. Universal school-based depression prevention 'Op Volle Kracht': A longitudinal cluster randomized controlled trial. *J Abnorm Child Psychol*. 2016;44:949–61.
 49. Wijnhoven LA, Creemers DH, Vermulst AA, Scholte RH, Engels RC. Randomized controlled trial testing the effectiveness of a depression prevention program ('Op Volle Kracht') among adolescent girls with elevated depressive symptoms. *J Abnorm Child Psychol*. 2014;42(2):217–28.
 50. de Jonge-Heesen KW, Rasing S, Vermulst AA, Scholte RH, van Ettehoven KM, Engels RC, et al. Randomized control trial testing the effectiveness of implemented depression prevention in high-risk adolescents. *BMC Med*. 2020;18(1):1–13.
 51. Unwin G, Tsimopoulou I, Kroese BS, Azmi S. Effectiveness of cognitive behavioural therapy (CBT) programmes for anxiety or depression in adults with intellectual disabilities: A review of the literature. *Res Dev Disabil*. 2016;51:60–75.
 52. Bakken TL. Psychosocial treatment of major depression in people with intellectual disabilities. Improvements within the last four decades: points of view. *International Journal of Developmental Disabilities*. 2021;67(5):366–70.
 53. Graser J, Göken J, Lyons N, Ostermann T, Michalak J. Cognitive-behavioral therapy for adults with intellectual disabilities: A meta-analysis. *Clinical Psychology: Science and Practice*. 2022;29(3):227–42.
 54. Menezes M, Harkins C, Robinson MF, Mazurek MO. Treatment of depression in individuals with autism spectrum disorder: A systematic review. *Research in Autism Spectrum Disorders*. 2020;78:101639.
 55. McGillivray JA, Evert HT. Group cognitive behavioural therapy program shows potential in reducing symptoms of depression and stress among young people with ASD. *J Autism Dev Disord*. 2014;44:2041–51.
 56. Carrick O, Tunick R. ADHD and Depression. In: Schonwald A, editor. *ADHD in adolescents: A comprehensive guide*. Switzerland: Springer Nature; 2020. p. 125–139.
 57. Shirk SR, DePrince AP, Cristosomo PS, Labus J. Cognitive behavioral therapy for depressed adolescents exposed to interpersonal trauma: An initial effectiveness trial. *Psychotherapy*. 2014;51(1):167.
 58. Meinzer MC, Schwartz KT, Tiece P, Horn SR, Chronis-Tuscano A. From the clinic to schools: iterative development of a depression prevention program for adolescents with ADHD within an urban school system. *Cogn Behav Pract*. 2023;30(1):116–32.
 59. Gu Y, Xu G, Zhu Y. A randomized controlled trial of mindfulness-based cognitive therapy for college students with ADHD. *J Atten Disord*. 2018;22(4):388–99.
 60. Schwartzman JM, Roth MC, Paterson AV, Jacobs AX, Williams ZJ. Community-guided, autism-adapted group cognitive behavioral therapy for depression in autistic youth (CBT-DAY): Preliminary feasibility, acceptability, and efficacy. *Autism*. 2024;28(8):1902–18.
 61. Shochet IM, Saggars BR, Carrington SB, Orr JA, Wurfl AM, Kelly RL, et al. A school-based approach to building resilience and mental health among adolescents on the autism spectrum: a longitudinal mixed methods study. *Sch Ment Heal*. 2022;14(3):753–75.
 62. Chan A-W, Tetzlaff JM, Gøtzsche PC, Altman DG, Mann H, Berlin JA, SPIRIT, et al. explanation and elaboration: guidance for protocols of clinical trials. *BMJ*. 2013;2013:346.
 63. Bodden D, Braet C, Stikkelbroek Y. *Children's depression inventory-2*. Amsterdam: hogrefe; 2016.
 64. Muthén LK, Muthén BO. How to use a Monte Carlo study to decide on sample size and determine power. *Struct Equ Model*. 2002;9(4):599–620.
 65. Campbell MK, Thomson S, Ramsay CR, MacLennan GS, Grimshaw JM. Sample size calculator for cluster randomized trials. *Comput Biol Med*. 2004;34(2):113–25.
 66. Kleinjan M, Pieper I, Stevens G, Van de Klundert N, Rombouts M, Boer M, et al. Geluk onder druk?: Onderzoek naar het mentaal welbevinden van jongeren in Nederland. Unicef, 2020 [Available from: unicef.nl/files/Rapport_Geluk%20onder%20druk_DEF_interactief.pdf]
 67. Rasing SP, Creemers DH, Vermulst AA, Janssens JM, Engels RC, Scholte RH. Outcomes of a randomized controlled trial on the effectiveness of depression and anxiety prevention for adolescents with a high familial risk. *Int J Environ Res Public Health*. 2018;15(7):1457.
 68. Eldredge LKB, Markham CM, Ruiter RA, Fernández ME, Kok G, Parcel GS. *Planning health promotion programs: an intervention mapping approach*. 4th ed. San Francisco: Jossey-Bass; 2016.
 69. Steendam M. Gatekeepers in gesprek met suïcidale jongeren. *JGZ Tijdschrift voor jeugdgezondheidszorg*. 2015;47:117–.
 70. Kovacs M, MHS Staff. *Children's Depression Inventory 2nd edition (CDI 2): Technical manual*. Toronto, Canada: Multi-Health Systems; 2011.
 71. Kerkhof A, Huisman F. *Vragenlijst over Zelfdoding en Zelfbeschadiging (VOZZ)*. Signalering en bespreking van suïcidaleit bij jongeren. Handleiding. Houten: Bohn, Stafleu en van Loghum. 2017.
 72. Bae Y. *Test review: children's depression inventory 2 (CDI 2)*. Los Angeles, CA: Sage Publications Sage CA; 2012.
 73. *Richtlijnen jeugdhulp en jeugdbescherming. Richtlijn stemmingsproblemen*. 2023. [Available from: richtlijnenjeugdhulp.nl/stemmingsproblemen].
 74. Silverman WK, Albano AM. *Anxiety disorders interview schedule for DSM-IV: Child version*. Graywind, New York: Oxford University Press; 1996.
 75. Silverman WK, Saavedra LM, Pina AA. Test-retest reliability of anxiety symptoms and diagnoses with the Anxiety Disorders Interview Schedule for DSM-IV: child and parent versions. *J Am Acad Child Adolesc Psychiatry*. 2001;40(8):937–44.
 76. Huisman A, Smits N, Kerkhof A. *Signaleren van suïcidaleit bij jongeren met de VOZZ-vragenlijst*. JGZ Tijdschrift voor jeugdgezondheidszorg. 2015;47:118–20.
 77. Chorpita BF, Yim L, Moffitt C, Umemoto LA, Francis SE. Assessment of symptoms of DSM-IV anxiety and depression in children: A revised child anxiety and depression scale. *Behav Res Ther*. 2000;38(8):835–55.
 78. Klaufus L, Verlinden E, Van Der Wal M, Kösters M, Cuijpers P, Chinapaw M. Psychometric evaluation of two short versions of the Revised Child Anxiety and Depression Scale. *BMC Psychiatry*. 2020;20(1):1–12.
 79. Ebesutani C, Korathu-Larson P, Nakamura BJ, Higa-McMillan C, Chorpita B. The revised child anxiety and depression scale 25–parent version: scale development and validation in a school-based and clinical sample. *Assessment*. 2017;24(6):712–28.
 80. Jellesma FC, Rieffe C, Terwogt MM. The somatic complaint list: validation of a self-report questionnaire assessing somatic complaints in children. *J Psychosom Res*. 2007;63(4):399–401.
 81. Enders CK. *Applied missing data analysis*. New York: Guilford Press; 2010.
 82. Johnson DR, Young R. Toward best practices in analyzing datasets with missing data: Comparisons and recommendations. *J Marriage Fam*. 2011;73(5):926–45.
 83. Little RJ. A test of missing completely at random for multivariate data with missing values. *J Am Stat Assoc*. 1988;83(404):1198–202.
 84. Cohen J. A power primer. *Psychol Bull*. 1992;112(1):155.
 85. Curran PJ, Muthén BO. The application of latent curve analysis to testing developmental theories in intervention research. *Am J Community Psychol*. 1999;27(4):567–95.
 86. Grimm KJ, Ram N, Estabrook R. *Growth modeling: Structural equation and multilevel modeling approaches*. New York: Guilford Publications; 2016.
 87. Muthén LK, Muthén BO. *Mplus User's Guide*. 8th ed. Los Angeles, CA: Muthén & Muthén; 1998–2017 [Available from: statmodel.com/download/usersguide/MplusUserGuideVer_8.pdf]

88. McGillivray J, Kershaw M. Do we need both cognitive and behavioural components in interventions for depressed mood in people with mild intellectual disability? *J Intellect Disabil Res.* 2015;59(2):105–15.
89. Seymour KE, Miller L. ADHD and depression: the role of poor frustration tolerance. *Curr Dev Disord Rep.* 2017;4:14–8.
90. Riddell S. Education and disability / Special needs: Policies and practices in education, training and employment for students with disabilities and special educational needs in the EU. Network of Experts in Social Sciences and Education Training; 2012. [Available from www.nesse.fr/nesse/activities/reports].

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.