Effectiveness of Psychosocial School Interventions in Finnish Schools for Refugee and Immigrant Children, “Refugees Well School” in Finland (RWS-FI): A Protocol for a Cluster Randomized Controlled Trial

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Abstract

Background

Schools are considered as natural environments to enhance students' social-emotional skills in general and mental health and affiliation among students with refugee and immigrant background. A layered or tiered provision of services are recommended as they can be effective to meet the needs of war-affected adolescents' who variably show posttraumatic stress disorder (PTSD). The current study tests the effectiveness of multi-layered interventions integrating targeted cognitive-behavioral treatment-based TRT (Teaching Recovery Techniques), a class-room focused preventive intervention PIER (Peer Integration and Enhancement Resources), and a whole school psychoeducative teacher-led intervention INSETT (In Service Teacher Training) in enhancing the wellbeing of children in their school environments. We analyze first, whether the interventions are effective in decreasing symptoms of PTSD and psychological distress and increasing positive resources i.e. prosocial behavior and resilience among refugees and immigrant students. Second, we analyze which student-, school- and parent-related factors mediate the possible beneficial changes, and third, we look at which groups benefit the interventions most.

Methods

A three-arm cluster RCT with parallel assignment, with approximately 1:1 allocation ratio, is applied among 16 schools that agreed to participate in the Refugees Well School interventions and effectiveness study. Schools were randomized to three conditions of two active interventions and a waiting-list control condition. Students, their parents, and teachers in intervention and control schools participate at baseline before the interventions, after the interventions, and at 6 to 12 months after the interventions. The primary effectiveness criterion variables are psychological distress (SDQ) symptoms, resilience (CYRM-12), executive functioning (AEFI) and prosocial behavior (SDQ). PTSD (CRIES-8) symptoms are used as outcome variable in one of the interventions (TRT).

Discussion

The current study provides a recommended universal approach of layered interventions aiming to reduce psychological distress and increase resilience among migrated students. Combination of promotive, preventive and targeted interventions may offer a holistic, ecological intervention package for schools to better address the needs of the whole group.

Trial registration:

ISRCTN, identifier: ISRCTN64245549. Registered 10. June 2020. Retrospectively registered, <http://www.isrctn.com/ISRCTN64245549>

Administrative Information

Note: the numbers in curly brackets in this protocol refer to SPIRIT checklist item numbers. The order of the items has been modified to group similar items (see <http://www.equator-network.org/reporting-guidelines/spirit-2013-statement-defining-standard-protocol-items-for-clinical-trials/>).

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Background

Research shows heightened levels of mental health problems including posttraumatic stress (PTSD), depressive, dissociative and aggressive symptoms among refugee children and adolescents(1-3). Yet, children and adolescents have a remarkable capacity for adaptation and resilience, and positive resources are also commonly observed among refugee and immigrant adolescents(4-6). Augmenting research is available about effective ways to promote refugee and immigrant children’s positive adaptation in a new country and prevent risks of mental health and developmental problems(7-9).

Schools are natural environments to provide psychosocial support for minors(10-13). Nevertheless, targeted school-based interventions have been criticized for their inability to cover the full range of multifaceted problems refugee youth face in their everyday life(14-17). Multi-layered or triad intervention models may match more accurately with the needs of adolescents exposed to traumatic war experiences and refugee-related stress(18-20). Accordingly, the present study analyses effectiveness of a three multi layered intervention model to prevent mental health problems and promote resilience among refugee and immigrant adolescents. It further examines underlying student-, school- and home-related mechanisms and determinants of potential change, and analyses preconditions for successful psychosocial school interventions.

Effectiveness of Multi-Layered and Targeted Psychosocial Interventions among Refugee Youth

Multilayered intervention models, also known as public health approach, typically involve promotive universal psychosocial support interventions, preventive interventions provided to whole schools or classrooms, and targeted cognitive-behavioral therapies (CBT) and other treatments to those adolescents who show clinically significant symptoms of PTSD or depression(19, 21). Although this approach is increasingly recommended, only few studies have assessed effectiveness of multi-layered interventions(22-24). The results seem promising but are rather inconsistent, and lack statistical power.

First study(22) presented a practice-driven evaluation of a multi-layered community-based care package in four war-affected countries. Client satisfaction was high and post-treatment reduction of mental health problems were moderate. Yet, service providers reported significant levels of distress related to service delivery. Second study(23) assessed effectiveness of a school-based mental health program for traumatized immigrant children and adolescents. All students were provided with an array of clinical services including CBT, supportive therapy and coordinating services. A trauma-focused (TF) CBT was implemented with a subset of students. Greater quantities of CBT and supportive therapy increased psychosocial functioning, while greater quantities of coordinating services decreased PTSD symptoms. TF-CBT was associated with both improved functioning and decreased PTSD symptoms. Results thus suggest that the comprehensive school-based model was effective and that different service components resulted in specific outcomes. Third one(24) examined the effectiveness of four-tiered program for young Somali refugees, including community resilience building, school-based universal early intervention, and targeted treatment for students suffering from severe psychological distress. Yet, they reported decrease in PTSD and depressive symptoms of single interventions but did not compare different intervention or report the multi-layered results.

School- or classroom-based promotive and preventive interventions are often delivered through teachers' education. Enhancing teachers' cultural competences and knowledge on pedagogic impact of trauma is based on the ecological systems developmental theories(25). Teachers have pivotal role in promoting the mental health of refugee and migrant students(26-30). The promoting intervention in the current study is In Service Teachers' Training (INSETT) which aims at enhancing teachers' cultural competence and self-efficacy through training.

Reviews on focused psychosocial school interventions among trauma-affected refugee and immigrant children show generally beneficial impacts, indicated by decrease in PTSD, depressive, and anxiety symptoms, and functional and peer problem(20, 31-33). Yet, effect sizes vary greatly, ranging between moderate and very high, and null results emerge, too(34-36). Commonly implemented targeted psychosocial interventions are cognitive behavioral treatments with trauma-focus (TF-CBT), involving therapeutic elements of verbally or multimodally processing past traumatic events, various creative techniques, such as drama, music and drawing, and classroom shared activities. Encouraging children to construct a new narrative from their shattered experiences in a safe environment, interaction with peers and expression of painful emotions are common elements to these interventions(37). Teaching Recovery Techniques (TRT), the targeted intervention used in the current study represents TF-CBT-based approach.

Further systematic reviews confirmed that school-based interventions for refugee and immigrant children and adolescents can attune anxiety and depression and reduce PTSD symptoms(32, 38). Interventions using methods based on CBT have been found to be especially effective generally with trauma-affected children(39), but also interventions with creative elements of writing, drawing or drama are found to decrease immigrant children's and adolescents' mental health problems(38), and increasing resources, such as effective coping and hope(40). Peer Integration and Enhancement Resources (PIER) classroom intervention further provides group-process-based tools to encourage, enrich and evoke multicultural friendship and atmosphere where adolescents can process their traumatic experiences in safe environment.

Mediating and Moderating Analyses of Psychosocial Interventions

In a review of reviews, researchers(41) found strong empirical evidence for four mechanisms of change associated with psychosocial interventions improving wellbeing, mental health and resilience among children affected by war. The first mechanism was family and caregiver capacity building involving support to families, caregivers and practitioners to enable them to enhance child wellbeing through psychoeducation, dialogue, and self-care, and, second, strengthening of family and caregiver relationship with children facing traumatic stress. Strengthening relationships was especially important in collectivist cultures where family relationships form a core resource. The third mechanism related to children's own capacities, especially improving active problem solving, effective coping and mastery of traumatic experiences. The fourth mechanism was therapeutic rapport in targeted interventions, indicated by trusting therapeutic relationship and a safe environment for disclosure of traumatic experiences. It is noteworthy that research evidence for TF-CBT-based mechanisms, such as trauma processing through reconstructing harmful cognitions, enriched narratives and playing, or effective regulation of painful emotions had only moderate evidence. Also, interventions focusing on strengthening community and cultural resources, values and rituals did not gain high-quality support among war-affected children.

A study based on ecological resilience framework found that increased social support mediated the intervention impact on PTSD symptoms, while hypothesized change in attitudes of hope or coping strategies did not(42). Using metadata, one study(43) found only psychosocial functioning (in

personality, social and academic domains) to mediate intervention impact on mental health among children in low-resource humanitarian settings. Instead the hypothesized effective coping strategies, social support or positive attitudes of hope were not significant mediators of intervention impacts.

Concerning the social relations, we could not find intervention studies examining peer-relations or peer/social support as mediators for mental health or wellbeing outcomes on refugee or migrant youth.

Objectives

The first aim of research project is to test whether two school-based psychosocial intervention arms, (a) the combined In-Service Teacher Training (INSETT) and Teaching Recovery Techniques (TRT) and/or (b) the Peer Integration and Enhancement Resource (PIER), are effective in improving the mental health among refugee, migrant, and Finnish native adolescents. The criteria for intervention effectiveness are reducing psychological distress (internalizing and externalizing symptoms) and increasing prosocial behavior and resilience compared to adolescents in control schools. The second aim is to examine which adolescent- and/or school-related factors could explain the effectiveness of these two arms of school-based psychosocial interventions (Mediation analysis). Third, we analyze whether the adolescent- and family-related preconditions differ in the effectiveness of these two intervention arms (Moderation analysis).

The research hypotheses are:

1. Do the psychosocial school interventions have a positive effect on the mental health of immigrant adolescents? In more detail, the aim is to compare the impact of INSETT+TRT and PIER to waiting-list control group on internalizing and externalizing symptoms and prosocial behavior and resilience.

1.1 We hypothesize that internalizing and externalizing symptoms will decrease statistically significantly only among adolescents participating in the INSETT+TRT and PIER interventions and not in the control group from baseline (T1) through six-month (T2) and twelve-month (T3) follow-ups.

1.2 We hypothesize that prosocial behavior and resilience will increase only among adolescents participating in the two arms of interventions and not in the control group.

2. Do different adolescent- and school-related factors explain (mediate) the effects of the INSETT and PIER interventions on adolescent mental health?

2.1. Concerning INSETT, we hypothesize that participation of teachers increases their multicultural awareness, sense of self-efficacy and work engagement, and decreases their work stress, which in turn is associated with the decreased internalizing and externalizing symptoms and increased prosocial behavior and resilience among the adolescents.

2.2. We hypothesize that adolescents' participation in PIER intervention is associated with their increased social support, feeling of belongingness, number of inter-ethnic friendships, and satisfaction on friendships, which in turn is associated with the decrease of internalizing and externalizing symptoms and the increase of prosocial behavior and resilience.

2.3. We hypothesize that adolescents' participation in TRT intervention is associated with decreased PTSD symptoms of intrusion, avoidance and hyperarousal, which in turn is associated with decreased internalizing and externalizing symptoms and increased prosocial behavior and resilience.

3. How do parent- and adolescent-related factors moderate the effectiveness of the two arms of school-based psychosocial interventions of INSET+TRT and PIER?

3.1 We hypothesize that good parental mental health and parents' high sense of competence and confidence in parenting are associated with statistically significant positive intervention-induced change in adolescents' mental health (i.e., decrease in internalizing and externalizing symptoms and increase in prosocial behavior and resilience).

3.2 We hypothesize that adolescents who report low severity of daily stressors and low perceived discrimination show more statistically significant positive intervention-induced change in their mental health (i.e., decreased internalizing and externalizing symptoms, and increased prosocial behavior and resilience).

Trial design

The study is a three-arm clustered parallel assignment, multi-center, exploratory randomized, controlled trial (RCT) comparing INSETT+TRT and PIER to waiting list conditions located in 16 schools in Finland. Primary unit of analysis is the school. The schools were block-randomized(44) in a parallel-group condition with varying block sizes and an allocation ratio of 1:1. The voluntary schools with (intensive) immigrant student population were randomly allocated to different intervention and control conditions. Blinding of participants, intervention providers, outcome assessors or data analysts was not possible due to explicit nature of interventions and small number of research staff. The control schools will receive the INSETT intervention toolkit after the research part of the project has ended. Trial aims to follow SPIRIT guidelines in reporting. The table 1 below is designed as comparable to the SPIRIT figure and the checklist can be found as an attachment.

Study setting and participants

Our aim was to have 15 schools that have altogether 250 immigrant and 250 native secondary school pupils (age 13–15 years) to participate in each of the two intervention conditions. We focused on immigrant youth who have resided in Finland for less than 6 years. In addition, a control group of 250 immigrant and 250 native youths would be gathered from 15 comparable schools. The EU-research group has made the power analyses that serve as motivation for the sample sizes. Figure 1. presents the flowchart of recruitment. 16 schools expressed their interest in participating the study. According to the

randomization eight schools were allocated into INSETT+TRT intervention, three schools were allocated into PIER and five schools serve as waiting-list controls. Also, Figure 1. reports the numbers of students, teachers and parents who answered the survey in the first round of data collection.

Recruitment and Sampling

The recruitment of schools was based on three aspects. First, voluntariness i.e., their (headmasters and teachers’) self-defined need for intervention, knowledge and training on psychosocial skills implemented in teaching refugee and immigrant adolescent students. For that purpose, the first recruitment was through advertisement in the national teachers’ magazine (Opettaja) and through email lists to school administration in every municipality in Finland. Second, the recruited and voluntary schools should have a considerable share of refugee and immigrant background pupils in secondary school classes, estimated as 30–50 percent (%) in each class. Third, the schools accepted the possibility of serving as a waiting-list school until the next school year when they would be provided the INSETT intervention in electronic form. This primary recruitment was complemented with about 100 phone calls to headmasters of schools residing close to the asylum seekers’ centers in numerous towns and municipalities in Finland. In addition, phone calls and e-mail communication were established to invite schools from metropolitan area due to their large share of adolescents with refugee and immigrant background. As a whole, 16 schools participated, and most extra work to reach schools near asylum-seeker centers and metropolitan area was not successful as schools informed that they already had a number of general interventions (such as anti-bullied whole-school programs) or trauma and refugee focusing programs (such as cultural coaching programs).

Table 1. presents the timeline for implementing interventions, collecting data (T1, T2, T3) and providing the intervention for waiting-list control schools. Baseline data was collected before the interventions, INSETT+TRT and PIER interventions were implemented between August 2019 and January 2020, post-intervention data collection happened around February 2020 and the follow-up data will be collected August 2020. INSETT will be provided to waiting-list control schools October 2020.

Table 1

Timeline of Data Collection and Intervention Participation according to School Randomization (comparable to SPIRIT Figure 1)

Eligibility criteria

The unit of recruitment was schools. As both the INSETT+TRT and PIER interventions aim at enhancing school belonging, high peer quality, interethnic friendships and understanding and protecting cultural diversity, we included both native-Finnish and refugee-immigrant adolescents to the interventions and effectiveness study. The only exclusion criterion for schools is not to have other similar psychosocial interventions running at the same time. For students there were not exclusion criteria and all signing the informed consent could participate. The 16 schools locate across the country of Finland and represent mainly refugee and immigrant dense urban areas. One school is from the South, (the metropolitan area), two locate in the East, three in the Middle, two in the Western and three in the Northern Finland. Whether a participant would not want to continue participating the study, s/he may do so simply informing the researchers and the given participant data will be deleted from the system. If the participation in an intervention causes harm to a participant, then s/he will be advised to appropriate services. Reported experiences of caused harm will be stored anonymously and described in results.

The Interventions

In-service Teacher Training (INSETT) is delivered by lower secondary school teachers and counsellors in introductory-, preparatory-, or ordinary classes. The INSETT aims at enhancing teachers' competence and self-efficacy in three key areas: (1) Promoting and supporting mental health and well-being among trauma-affected students with refugee and migration backgrounds. (2) Encouraging positive interethnic relationships in linguistically and culturally diverse school settings. (3) Fostering relationships with parents/caregivers to promote co-operation and involvement with schoolwork. The teachers' training and

awareness building is expected to benefit wellbeing and sense of belonging of refugee- and immigrant students directly and their caregivers indirectly.

Practically the intervention involves a combination of two seminar days with lectures, discussions, exercises, and exchange of ideas and experiences between participating teachers, and an online training course to be completed by the teachers individually. The INSETT manual provides seminar topics, materials and literature to prepare thematic sessions, and slides(45) and the online training course "*Providing support to refugee minors*" by the Augeo Foundation in the Netherlands(46) extensive local-language material to schools in Finland, Norway and Sweden.

Peer Integration and Enhancement Resource (PIER) is delivered by lower and upper secondary school teachers, counsellors, and special teachers in school classes including both native and refugee- and immigrant students. The PIER aims at supporting safe and positive peer interactions and social relationships in multi-ethnic schools by strengthening sense of belonging, empathy, role-taking and learning from each other and get and give more social support through group exercises. The manualized intervention consists of eight sessions ranging between 45 to 90 minutes, with structured welcoming and ending-rituals, multimodal group activities such as cartoon drawing, role-play, movies, drama, and ways of reflecting various identities, migration and racism.

The school staff delivering the PIER participated in a two-day training. The first included practicing each intervention session and going through the resource material and the second sharing of experiences and providing the RWS trainers (researchers) with valuable ideas to improve the intervention.

Teaching Recovery Techniques (TRT) is a manualized group treatment developed by the Children and War foundation(47), based on TF-CBT. The aims are to reduce PTSD symptoms of intrusion, avoidance and hypervigilance, increase resilience, stabilize trauma reactions, and provide practical techniques and strategies to deal with traumatic memories, physical and behavioral arousal and withdrawal. Treatment elements include psychoeducation (in playful and multimodal ways), normalizing reactions to trauma, working with nightmares, framing techniques to master intrusive memories and trauma reminders and scaling techniques to deal with avoidance and arousals. Homework such as sleep hygiene or reflective observation of trauma reminders are an essential part of the TRT.

The TRT consists of five sessions of 90 to 120 minutes including skills training, rehearsal and homework, and the handbook provides each session with several tools, techniques and procedures. The core aim is to create a sense of safety, increase feelings of competence and shared hope. The two parent/caregiver sessions include information about various responses to traumatic events and effective coping strategies. School personnel delivering the TRT participate in two-day intensive training provided by a licensed trainer from Children and War Foundation or from Finland. Qualified trauma psychologists offer TRT providers work-counselling during the intervention.

Data collection and management

Survey data is collected fully online from students and teachers and informed consent is collected both on paper and online in the beginning of the survey. Foreign-speaking parents receive both online and paper survey access together with the informed consent form both on paper and online. Online survey is managed using a secure online survey tool(48) and all identifiable information will be stored separately from the research data. Researcher team will collect informed consents first in schools and later via mail. In order to avoid attrition participants will receive a personal invitation via e-mail and two reminders to answer the post-intervention (T2) and follow-up (T3) surveys. RWS-consortium will manage and store the research data and will have a common data management plan available online.

Measures

Table 2 presents the measurements taken at each three assessment points before, during and after the interventions. Model form of the informed consent and detailed description of questionnaires is available from the first author upon request.

Table 2 Study Constructs, Measures and Questionnaires of Students, Parents and Teachers

	Construct	Measure	Assessment tool
STUDENTS	Youth mental health	PTSD symptoms	Children's Revised Impact of Events Scale (CRIES-8)
		Internalizing and externalizing problems and prosocial behaviour	Strengths and Difficulties Questionnaire (SDQ)
		Positive development and resilience	Child and Youth Resilience measure (CYRM-12)
	Associated factors of Youth Mental Wellbeing	Academic achievement / Executive functions	The Amsterdam Executive Function Inventory (AEFI)
		Wellbeing	Item developed for this study
		Experience of the number of stressors in daily life	Daily Stressors questionnaire (DSSYR; Vervliet, Derluyn, & Broekaert, unpublished)
		Social Support	Multidimensional Scale of Perceived Social Support (MSPSS)
		Existence of interethnic friendships and Satisfaction on friendships	Items developed for this study
		Discrimination	The Perceived Ethnic Discrimination Questionnaire Community Version (PEDQ-CV)
		School Belonging	The psychological sense of school membership among adolescents (PSSM)
	Sociodemographic factors	gender, age, country of birth, migration status, time in host country and family composition	
PARENTS	Parental health	Self-reported health	One item of the SF-36
		Mental health	General health questionnaire (GHQ-12)
		PTSD symptoms	PTSD-8 questionnaire
	Home-school relations	Teacher-Parent collaboration	Trust Scale
	Parent experiences of inclusion	Experience of discrimination	Brief Perceived Ethnic Discrimination Questionnaire – Community version (PEDQ-CV)
		Social support	Enriched Social Support Instrument (ESSI)

	Family relations	Parenting	Me as a Parent (MaaP)
		Parent-rated strengths and difficulties of the child	Strengths and Difficulties Questionnaire - parent rated (SDQ-25 with impact supplement)
	Sociodemographic factors	sex, age, marital status, number of children in a household, employment situation, education, income, time in host country, migration status, reason for migration, separation of family members during migration	
TEACHERS	Cultural competence	Multicultural awareness and understanding	Teacher Multicultural Attitude Scale (TMAS)
	Self-efficacy	Teachers' self-efficacy	Teachers' Sense of Efficacy Scale (TSES)
	Stress and work engagement	Stress symptoms	Single item stress index (SISI)
		Work exhaustion/burnout	Bergen burnout inventory (BBI)
		Work engagement (vigor, dedication, absorption)	Utrecht work engagement scale (UWES)
	Home-school interrelations	Teacher-parent collaboration	Trust Scale
	Intervention	Classroom atmosphere	Items from a school intervention study
	Sociodemographic factors	sex, age, teaching background, number of students	

Primary measures

Psychological distress, i.e., internalizing and externalizing problems are measured with the self-report version of the Strengths and Difficulties Questionnaire (SDQ)(49) for 11–17-year-olds. SDQ is a screening questionnaire that measures 25 attributes divided into either two sub-scales of internalizing and externalizing problems, or five sub-scales: emotional symptoms, conduct problems, hyperactivity-inattention, peer problems, and prosocial behavior. All questions are asked on a scale 'not true', 'somewhat true', to 'certainly true'. 'Somewhat true' is always scored as 1, but the scoring of 'not true' and 'certainly true' varies with the item. For each of the five scales the score can range from 0 to 10 if all items are completed. Goodman(50) reports SDQ have an acceptable validity and reliability (lowest in peer problems α : .41 and highest in total difficulties α : .80). Although, research shows good validity for internalizing scales indicated by correspondence between children, parents and teacher reports, and clinical review(51).

Resilience is measured with an adapted, focus group-based Child and Youth Resilience Measure (CYRM-12)(52). CYRM was originally designed as a 28-items measure for youth aged 9 to 23 years old. A reduced resilience measure (CYRM-12) consists of 12 items, which are scaled as 5-point (1 'not at all' to 5 'a lot'). A total score is created by summing up the score of each item. CYRM is a questionnaire exploring the individual, relational, communal and cultural resources that may bolster the resilience of 9-23-year-old youth. The participant reports on a 5-point scale as to what extent he/she feels he/she has certain resources. Preliminary results show sufficient content validity of the CYRM-12 to merit its use as a screener for resilience processes in the lives of adolescents, and reliability was α : .84.

Executive functions are measured with The Amsterdam Executive Function Inventory (AEFI)(53) subscale called "planning and initiative". AEFI subscale has five items that are scored on a three-point scale (1 'not true', 2 'somewhat true', 3 'true'). Authors report AEFI has adequate construct validity, but moderate reliability (α : .60).

Overall wellbeing is measured with one question developed for this study. It asks person's overall wellbeing on a five-point scale (1 'very bad', 2 'bad', 3 'not good or bad', 4 'good', 5 'very good'). So far there is no evidence on the reliability or validity of this measure.

Post-traumatic stress symptoms (PTSD) are screened with Children's Impact of Events Scale (CRIES-8) (54-56). CRIES-8 has two sub-scales, named intrusion and avoidance, and it is designed to be used in children aged 8 and above. The eight items are scored on a four-point scale (0 'Not at all', 1 'Rarely', 3 'Sometimes', 5 'Often'). Total score is the sum of scores from the two sub-scales. The screening cut-off is on $17 \leq$ points. CRIES-8 has been applied and its factors proved as robust in a variety of cultures. It has good construct validity and quite stable factor structure, it correlates well with other indices of distress, and it has been used to screen very large samples of at-risk-children following a wide range of traumatic events(57). Another study(58) reported CRIES-8 to have good internal consistency (α : .86).

Other measures

School belonging is measured with the Psychological sense of school membership among adolescents (PSSM)(59). *Social support* is measured with Multidimensional scale of perceived social support (MSPSS)(60). *Interethnic friendships* are measured as the number of interethnic friendships and satisfaction with friendships, measures were developed for this study. *Daily Stressors* are measured with the Daily Stressors questionnaire (DSSYR; Verlievt, Derluyn, & Broekaert, unpublished). *Discrimination* is measured with the Perceived Ethnic Discrimination Questionnaire Community Version (PEDQ-CV)(61).

Teachers' multicultural skills are measured with the Teacher Multicultural Attitude Scale (TMAS) (62). *Teachers' self-efficacy* are measured with the Teachers' Sense of Efficacy Scale (TSES) (63). *Teachers' work engagement and stress* are measured with three measures: Utrecht work engagement scale (UWES)(64), single-item stress index (SISI)(65), and Bergen burnout inventory (BBI) (66).

Parents' general and mental health are measured with one item of the SF-36(67), General health questionnaire (GHQ-12)(68), and PTSD-8 questionnaire(69). *Parenting* is measured with the Measure as a Parent (MaP)(70), *parents' social support* is measured with the Enriched Social Support Instrument (ESSI)(71), and *parents' perceived discrimination* is measured with the same as with adolescents(61).

Background variables

Adolescents report gender, age, country of birth, and migrant students also migration status, time in host country and family composition. Teachers report sex, age, teaching background, and number of students. Parents report sex, age, marital status, number of children in a household, employment situation, education, income, and immigrant parents also time in host country, migration status, reason for migration, and separation of family members during migration.

Analytic Strategy

Due to the sampling procedure, our data will be clustered in two levels; pupils are nested in 134 classes, and classes in 16 schools. The data contains variables from individual, class and school levels, and the interventions are given at school level. All the indicators of outcome variables are measured at three time-points in individual level, T1 immediately before the intervention, T2 20 weeks, and T3 as a follow-up 52 weeks after the intervention. We expect the intervention to change the levels in outcomes from T1 to T2, and the new levels to remain the same through T3 follow-up.

The structure of the data requires the use of structural equation (SEM) methods combining longitudinal, multilevel, path analytic models with confirmatory factor analysis. The psychometric properties of the outcome variables, including measurement invariance between timepoints T1, T2, and T3, are tested before constructing summary scales using most reliable items. The scales are then specified as manifest variables in the models. Alternatively, latent constructs are used, depending on the complexity of the final model specifications. The core model in all our analyses will be a version of latent growth curve model(72, 73), that is also known as intervention model(74) due to the coding of the fixed parameters in the model, which are responsible for the shape of the constant growth trajectories at the individual level (the 1's in Figure 2). The latent growth parameters will be estimated with Mplus 8.0 software using robust maximum likelihood estimator (MLR), which allows non-normal continuous indicators to be reliably analyzed. Additionally, MLR is a full-information estimator allowing the use of missing data without any separate imputations. The validity of MAR assumption is scrutinized and, if needed, auxiliary variables predicting missingness will be added into the models. Demographic and baseline characteristics will be summarized using means and standard deviations for quantitative variables and percentages for categorical variables.

Explanations: **Primary outcomes:** Y_1 = SDQ (difficulties); Y_2 = SDQ (strengths); Y_3 = CYRM; Y_4 = AEFI (Executive Function); Y_5 = Overall wellbeing; **Intervention status:** I_0 = waiting-list control group; I_1 = INSETT+TRT; I_2 = PIER; **Possible moderators:** Z_1 = SF-36; Z_2 = GHQ-12; Z_3 = PTSD-8; Z_4 = MaP; Z_5 = PEDQ-CV (parent); Z_6 = PEDQ-CV (adolescent); Z_7 = DSSYR; Z_8 = (Daily Stressors); $Z_{8...n}$ = sociodemographics;

Possible mediators: INSETT Teachers (competence); Mb_1 = TMAS; Mb_2 = TSES; Mb_3 = SISI; Mb_4 = BBI; Mb_5 = UWES; Mb_6 = Trust; Mb_7 = Classroom atmosphere; **TRT** Adolescents (trauma) Ma_1 = CRIES-8; **PIER** Adolescents (social) Mc_1 = MSPSS; Mc_2 = PSSM; Mc_3 = PEDQ; Mc_4 = Interethnic friendships.

In the core model (Figure 2), there are two latent state variables, measuring true scores of PRE- and POST-intervention levels of the outcomes. The PRE-intervention state is indicated by the measured T1 variable without time-related measurement error because there is only one measurement point. In the case of POST-intervention state, there are two indicators, enabling the modeling of measurement error. The loadings of the indicators in the measurement part of the model are fixed to 1's, meaning that the trajectory from T1 to T3 has the same shape for every individual. Only the level of PRE-intervention state and the difference between PRE- and POST-intervention states are random, so that the means and variances of these variables within and between the clusters can be estimated. As predictors of the POST-intervention state, our model specifies the PRE-intervention state (path coefficient a , which is anticipated to be negative due to floor and ceiling effects), a dummy for intervention/control group membership (direct effect c), and potential mediating variables (path coefficient e , implying indirect effect $d \cdot e$ for intervention-control-group difference). The covariance between PRE-intervention state and the dummy for intervention/control group membership (parameter b) is supposed to be zero, indicating that the randomization was successful. Moderation mechanisms are investigated by estimating the model simultaneously in groups created according to categorized moderator variables (multi-group SEM). Finally, the simple estimates of total intervention effects are calculated from a model without mediators and moderators (parameter c' divided by the variance of POST-intervention latent variable, giving an equivalent to Cohen's d).

Discussion

Most psychosocial interventions are targeted to immigrant children generally or those who suffer from PTSD or other symptoms, while there is a lack of universal interventions embedded in classrooms with both immigrant and native peers together (9, 19, 38). Further, professionals recommend combining both preventive universal psychosocial elements and targeted clinical therapies, tailored according to the needs of immigrant children (18, 20, 32). Given the growing numbers of immigrant children with an increased risk for mental health problems, there is a call to extend the research to include also information about child-, school- and family-related factors explaining the success of school-based interventions (32, 38). Similarly, the knowledge of what works for whom, why and where would be of great importance when tailoring effective treatment for immigrant children. In trauma research the relevant questions are about the factors and processes (or mechanisms) that explain (statistically mediate) the impact of war trauma on children's and adolescents' mental health, and who are most vulnerable to negative trauma impacts, and why (75). Analogously in intervention studies it is critical to know what explains the potential change and to whom interventions work and why.

Dissemination

The results of this trial will be submitted for publication during 2021–2022 and publications will be made open access. The INSETT and PIER Finnish-language intervention manuals will be prepared open-access to schools. The data sets generated during the study will not be made open access but can be requested from the first author and according to the ethical approval.

Trial status

This is the first version of the study protocol (dated 1st July 2020). Recruitment began in January 2019 and completed in August 2019.

Abbreviations

AEFI: The Amsterdam Executive Function Inventory; BBI: Bergen burnout inventory; CBT: cognitive-behavioral therapy; GHQ-12: General health questionnaire; CRIES-8: Children's Impact of Events Scale; CYRM-12: Child and Youth Resilience Measure; DSSYR: Daily Stressors questionnaire; ESSI: Enriched Social Support Instrument; INSETT: In Service Teacher Training; MaaP: Me as a Parent; MAR: Missing at random; MLR: Robust Maximum Likelihood; MSPSS: Multidimensional scale of perceived social support; PEDQ-CV: Perceived Ethnic Discrimination Questionnaire Community Version; PIER: Peer Integration and Enhancement Resources; PSSM: Psychological sense of school membership among adolescents; PTSD: posttraumatic stress disorder; RCT: randomized control trial; SDQ: Strengths and Difficulties Questionnaire; SEM: Structural Equation Modeling; SISl: single-item stress index; TF-CBT: cognitive behavioral treatment with trauma-focus; TSES: Teachers' Sense of Efficacy Scale; TMAS: Teacher Multicultural Attitude Scale; TRT: Teaching Recovery Techniques; UWES: Utrecht work engagement scale.

Declarations

Ethics and consent to participate

Ethical Committee for Human Sciences of Universities in the Tampere reviewed and approved the study setting, recruitment, informed consents, and measurement (Code #9/3/2019) in addition to the Horizon-2020 Ethical review. The Horizon_2020 -research team prepared informed consent documents on 18 languages, which guaranteed that all students and parents were informed about the project and their participation rights, and possibly sign their participation willingness in their mother language. Informed consent was obtained from all study participants. The participants signed at T1 also for their participation at T2 and T3. The project complies with the Code of Ethics of the World Medical Association (1964 Declaration of Helsinki and its later amendments). In addition to the two Ethical Committee approvals, permission was applied to conduct the study in all municipalities where the data collection and school interventions were planned. Altogether ten municipalities and three large cities approved the project (the three cities gave combined permission for two schools in each). The study is registered in the ISRCTN registry (ISRCTN64245549), date assigned and last edited 10.6.2020.

Consent for publication

Model form of the informed consent and detailed description of questionnaires is available from the first author upon request.

Availability of data and materials

RWS-consortium will manage and store the research data and will have a common data management plan available online.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

All coauthors contributed to the design of the study protocol, RK taking the lead. AV, ID, RLP, SA, AA, PKH, ES and CW were responsible for study design and interventions. KP and RLP are the principal investigators and led on the application for funding. RLP, RK, SA, RL, MV, KP and RLP are researchers in the trial team and responsible for the acquisition of data. RK, MV, KP and RLP led on writing the manuscript and trial registration. All authors contributed to drafting and refining the study protocol and approved the manuscript.

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Figures

Figure 1

The flowchart of experimental vs. control situations in the study design

Figure 2

Latent growth curve theoretical model for analysis

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