

Improving the implementation of KiVa antibullying program with tailored support: Study protocol for a cluster randomized controlled trial

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ABSTRACT

Background: There are no evidence-based models to support the implementation of school-based bullying prevention programs. Our primary objective is to examine the impact of tailored support on the implementation of the KiVa antibullying program. Our second objective is to evaluate whether the offered support influences student outcomes (e.g., victimization, bullying perpetration). We also assess the cost-effectiveness of the provided support and conduct a process evaluation.

Methods: In a cluster randomized control trial (cRCT), we compare program fidelity between schools that receive implementation support and those that do not. Twenty-four ($N = 24$) schools in Finland were randomized to either the IMPRES condition (receiving support, $n = 12$) or the control group (KiVa as usual, $n = 12$). In the IMPRES condition, pre-assessment and staff training were organized, and a selected team of staff members received four mentoring sessions during one academic year.

Staff and students answer questionnaires at the end of school year 0, at post-intervention (year 1) and again at the 1-year follow-up (year 2). Our primary outcomes concern two main program components — universal and indicated actions — reflecting program fidelity. As secondary outcomes, we examine the level of bullying victimization and perpetration as well as students' perception of several program fidelity indicators. Finally, we assess several tertiary outcomes, collect resource data and conduct qualitative interviews to perform additional analyses.

Conclusion: This trial will inform us of whether implementation support can boost program fidelity and have a distal impact on bullying prevalence.

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1. Background

Bullying, defined as repeated negative actions directed at a physically or socially less powerful peer [1], is a pervasive global problem among students in schools; victimized children suffer from loneliness, anxiety, depression and various somatic symptoms [2–4]. To overcome this problem, many bullying prevention programs have been developed, and although they have been found to reduce bullying [5,6], their full potential is often at risk in real-life conditions. For example, the KiVa antibullying program reduced the prevalence of bullying victimization in an efficacy trial conducted in Finland [7,8], but after the nationwide

broad roll-out, the effects were weaker [9], and some schools have struggled to maintain high program fidelity [10,11]. Indeed, some studies state that implementation support is needed [12,13], but so far, no evidence-based support models exist.

In the IMPRES (IMplementation REsearch) project, we develop such a model and evaluate whether it has an impact on program fidelity, using KiVa antibullying program (see for more [14,15]) as a case example. KiVa has been designed for basic education (grades 1–9, children aged 7–15) and has been found effective in reducing bullying among students in Finnish primary education (grades 1–6, see [7,8]) with more modest results in secondary schools (grades 7–9, see [8]) and

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outside Finland [16,17]. The program has also been found to be cost-effective [18].

Previous studies – many concentrating on KiVa – have examined program fidelity (i.e., the degree to which a program has been implemented as intended), such as exposure or dosage (e.g., the number of preventive lessons delivered) [19,20] and adherence (e.g., following the program-recommended methods when addressing bullying cases) [21]. Qualitative studies have shed light on the facilitators and barriers to both implementing [22] and sustaining [23] bullying prevention programs. For example, the importance of organizational factors – such as human resource management, resources as well as commitment and motivation among staff members – has been emphasized [23]. Furthermore, high program fidelity during the first three years of implementation and effective school-level coordination have been found to predict program sustainment [10]. In addition, headmasters' support to anti-bullying work is linked to higher levels of program adherence [24]. However, previous studies have rarely investigated how to support schools. Schools implementing KiVa, for example, are offered newsletters, quality recommendations, technical support, training opportunities and monitoring tools. The role of these actions in enhancing program fidelity and sustainment has been contemplated in a case study [25] but not evaluated.

IMPRES implementation support model (i.e. IMPRES support) consists of three elements, which are 1) assessment and feedback, 2) staff training and 3) mentoring, referring to a mentor regularly meeting a group of school staff members to coach, consult and/or facilitate depending on the needs of the mentees. Thus, mentoring is an ongoing, non-evaluative and collaborative effort striving to convey organizational and individual changes that could improve program fidelity. Such changes can be related to improvements in the schools' functioning in terms of, for example, awareness, preparedness and competence in preventing and handling bullying (see discussion [26]) as well as in individual staff members' knowledge, skills, attitudes and self-efficacy, which may both explain program fidelity and influence student outcomes (e.g., bullying behaviors). Previous studies have documented that, for example, teachers' self-efficacy to prevent and intervene in bullying is associated with the likelihood of them intervening [27], confidence in implementing a program is connected to the delivery of a higher number of program components [28] and that generally, being part of bullying prevention has a positive impact on teachers' self-perceived competence to tackle bullying [29,30]. In addition, Saarento et al. (2015) [31] reported that prevalence of bullying perpetration was lower in classrooms where students reported that their teacher disapproved of bullying. Thus, we anticipate that implementation support increases program fidelity which consequently will influence student outcomes. This reasoning is supported by the Conceptual Model of Implementation research (CMI, [32,33]), which distinguishes between implementation strategies (e.g., methods used to enhance implementation), implementation outcomes (e.g., program fidelity and costs) and client outcomes (e.g., reductions in bullying victimization and perpetration).

1.1. Objectives

The primary aim is to evaluate the effectiveness of the IMPRES support in promoting program fidelity in schools that have utilized KiVa for several years. We examine the number and quality of KiVa lessons delivered as well as adherence to guidelines in handling acute bullying cases. Our second aim is to examine the impact of the IMPRES support on students' views on a) the prevalence of bullying victimization and perpetration, b) teachers' antibullying attitudes and behaviors, c) the quality of the KiVa lessons students received and d) how bullying cases are handled.

Finally, we a) investigate the mechanisms via which implementation support can lead to lower levels of victimization and bullying perpetration, b) identify key factors (other than implementation support)

influencing program fidelity, c) evaluate the cost-effectiveness of the implementation support and d) conduct a process evaluation exploring the implementation processes taking place in schools.

2. Methods

2.1. Design and timeline

The IMPRES study is an ongoing, prospectively registered, cluster-randomized controlled trial (cRCT) with two parallel arms comparing program fidelity between schools that receive IMPRES support and schools that deliver KiVa as usual (see Fig. 1). The trial runs for 24 months: a pre-intervention assessment at the end of academic year 0 assessing program fidelity during the past school year (T0), a post-intervention data collection at the end of the following academic year (T1) as well as a follow-up one year after post-intervention data collection (T2).

2.2. The KiVa antibullying program

KiVa includes several program components. The universal actions for primary schools consist of KiVa lessons recommended to be delivered specifically to grades 1 and 4 with separate, age-specific curricula. Additionally, awareness towards bullying is raised with KiVa symbols (e.g., posters and recess supervisors' vests). School staff is provided with materials for a kick-off event for students and for a staff meeting. Furthermore, KiVa provides infographics and newsletters for introducing the program to parents. To address acute bullying cases, a KiVa team is formed among school staff and detailed guidelines for handling bullying cases are provided. Finally, KiVa schools monitor their progress with feedback based on KiVa's annual student and staff surveys.

2.3. Recruitment and setting

In the first phase of recruitment in winter 2020–2021, we contacted registered KiVa schools ($n = 794$) dispensing education in Finnish via email. To be included in the study, the schools needed to offer basic education for grades 1–6 (aged 7–12 years), have at least 100 students and be currently registered as KiVa program users (e.g., paid small annual fee, had access to program materials). From the forty-three schools that contacted us, we excluded schools operating in two or more locations. Eighteen of the schools offered basic education for grades 1–9 or had several classes of specialized education and were therefore excluded. After verification, twenty-one schools fitted the criteria. However, because of the COVID–19 pandemic, we delayed the start of the project by one academic year, and eight schools withdrew.

The second wave of recruitment took place in the fall of 2021. As we had already recruited several schools from the Helsinki metropolitan area, we only sent recruitment invitations to schools outside this area (only 538 schools out of 794 were contacted again). Six schools answered the call and were included in the study. At this stage, contrary to our original criteria, we included two schools offering basic education to grades 1–9. Thereafter, our research coordinator directly contacted 20 schools that fit our inclusion criteria, and six of them agreed to participate. All recruited schools had been implementing KiVa for multiple years.

2.4. Ethical and safety consideration

The study went through an ethical review and was given approval by the Ethics Committee for Human Sciences at the University of Turku in October 2021. Permission for conducting the study was sought for each school from the education providers (i.e., the municipality) and headmasters. Some education providers required active parental consent ($n = 9$) while others opted for passive consent ($n = 15$). Therefore, the type of consent used within each school was decided according to the

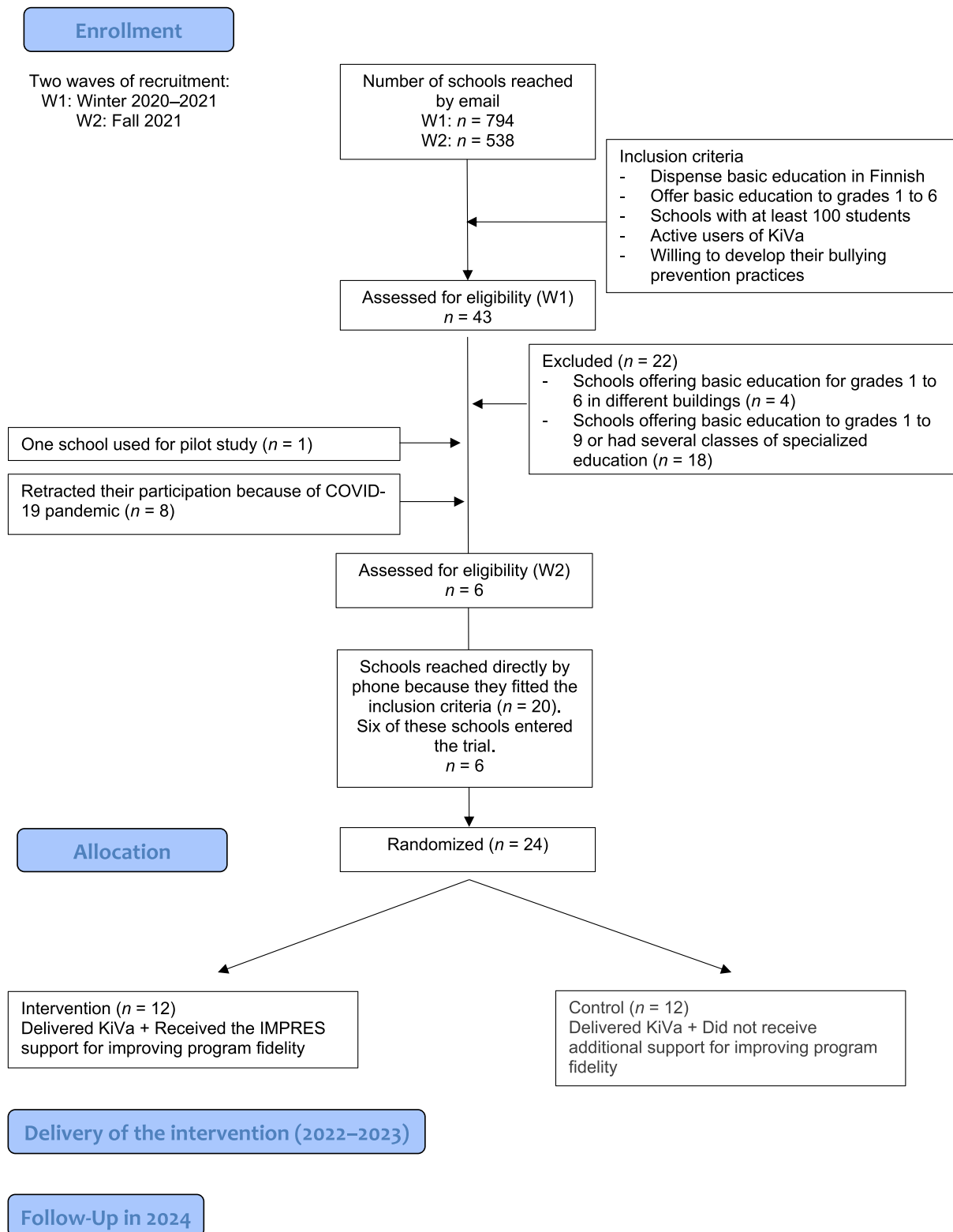


Fig. 1. CONSORT flow chart of the study design.

guidelines of their respective educational provider. All participating staff members and students give active consent to participate throughout the trial, and the legal guardians of the participating students are informed of the study.

2.5. Randomization and blinding

Schools were randomly assigned in a 1:1 ratio to either the IMPRES or the control (which delivered KiVa as usual) condition using the randomizeR package [34] on R software based on the computer-generated randomization sequence seed 241,999. The randomization was stratified by three blocks. The first block was the type of school

(primary [$n = 22$] or combined primary and secondary grade levels [$n = 22$]). The second was the number of students (>250 [$n = 12$] or <250 [$n = 12$]) and the type of parental consent utilized (active [$n = 9$] or passive [$n = 15$]). This study is an open-label trial, as the schools cannot be blinded to their condition. The second author, who was not involved in providing IMPRES schools with support, performed the randomization.

2.6. Data collection procedure and timeline

Table 1 presents all the constructs that will be assessed at the three waves. Both staff members and students are invited to participate. The recruitment of individual participants takes place at each wave (i.e., first graders as well as new students and staff members are recruited at each wave). Table 2 introduces the overall timeline of the IMPRES trial.

2.7. Experimental conditions

2.7.1. KiVa IMPRES (intervention condition)

The IMPRES support was delivered face-to-face over one academic year (2022–2023). It unfolded in three components:

- 1) Assessment: Survey for all staff members assessing the program fidelity at the end of the academic year and a detailed feedback report.
- 2) Training: At the beginning of next academic year, three hours of training to all staff members on effective bullying prevention. Targeted topics: 1) The KiVa program, 2) The importance of program fidelity, 3) Identification of core gaps in implementation based on the feedback report and 4) Suggestions for improvement. The training was provided by a pair of licensed KiVa trainers with research backgrounds. One of the trainers was also the mentor for the school.
- 3) Four meetings throughout the academic year: Creating a group of 4–6 voluntary staff members: a headmaster and members aware of the school's KiVa practices (e.g., KiVa team members or coordinators). The targeted topics: 1) Setting goals, 2) Creating an action plan, 3) Executing the plan (including a feedback survey) and 4) Reflection and planning the implementation ahead.

2.7.2. Control condition: KiVa as usual

The schools in the control condition implement KiVa as usual. At the end of the trial, they will receive a feedback report and a consultation of 1–2 h with an experienced KiVa trainer.

Table 1
Measurement timeline.

Target group	Measures			
	T0	Between T0 and T1	T1	T2
All school personnel	<ul style="list-style-type: none"> • Implementation capacity • Organizational features • Socio-demographic information 		<ul style="list-style-type: none"> • Implementation capacity • Organizational features 	<ul style="list-style-type: none"> • Implementation capacity • Organizational features
All teachers	<ul style="list-style-type: none"> • Fidelity of universal actions • Teachers' self-efficacy • Teachers' moral disengagement • Teachers' perception of bullying as a malleable problem 		<ul style="list-style-type: none"> • Fidelity of universal actions • Teachers' self-efficacy • Teachers' moral disengagement • Teachers' perception of bullying as a malleable problem 	<ul style="list-style-type: none"> • Fidelity of universal actions • Teachers' self-efficacy • Teachers' moral disengagement • Teachers' perception of bullying as a malleable problem
KiVa Team Headmasters	<ul style="list-style-type: none"> • Fidelity of indicated actions • School resources and socio-demographic information of the school 		<ul style="list-style-type: none"> • Fidelity of indicated actions • School resources and socio-demographic information of the school 	<ul style="list-style-type: none"> • Fidelity of indicated actions • School resources and socio-demographic information of the school
IMPRES Mentors		<ul style="list-style-type: none"> • Fidelity of IMPRES support 	<ul style="list-style-type: none"> • Fidelity of IMPRES support 	
IMPRES Mentees		<ul style="list-style-type: none"> • Fidelity of IMPRES support 	<ul style="list-style-type: none"> • Fidelity of IMPRES support 	
Students	<ul style="list-style-type: none"> • Bullying perpetration and victimization • Perception of teacher's antibullying attitudes and behaviors • Quality of the KiVa lesson delivered by the teacher • Socio-demographic information 		<ul style="list-style-type: none"> • Bullying perpetration and victimization • Perception of teacher's antibullying attitudes and behaviors • Quality of the KiVa lesson delivered by the teacher • Addressing acute bullying cases 	<ul style="list-style-type: none"> • Bullying perpetration and victimization • Perception of teacher's antibullying attitudes and behaviors • Quality of the KiVa lesson delivered by the teacher • Addressing acute bullying cases

2.8. Pilot study

IMPRES support was developed in collaboration with a primary school, which was chosen based on its location and size. Based on the pilot, the working methods (e.g., encouraging immediate action, setting goals) were fine-tuned, and the role of the mentees was clarified (e.g., promoting change in their organization, planning future KiVa activities between meetings).

3. Measures and analyses

3.1. Primary outcomes: program fidelity

3.1.1. Universal component – KiVa lessons

At each time point, the staff members who report delivering KiVa lessons indicate the extent to which each of the 10 KiVa lessons has been delivered to students. The scale has three anchors which are “1 = I have not delivered this lesson”, “2 = I have delivered this lesson partially” and “3 = I have delivered more than half of the is lesson”. A cumulative score will be calculated. Then, the respondents are asked to evaluate the quality of the delivered KiVa lessons by answering five items.

3.1.2. Indicated component – addressing bullying cases

KiVa team members answer ten questions on how consistently (1 = never, 2 = almost never, 3 = often, 4 = almost always, 5 = always) they have followed the recommended guidelines for handling bullying cases (only T1 and T2). Furthermore, the respondents indicate which intervention methods they have used when handling bullying cases (with the options being 1) confronting, 2) non-confronting, 3) either confronting or non-confronting depending on the case or 4) depending on the team member, 5) an adaptation or 6) not knowing which techniques were used [21]. In addition, they evaluate the KiVa team composition and functioning (only T1 and T2). Other staff members are asked whether the school has a KiVa team and whether they know its purpose (only T1 and T2).

3.2. Secondary outcomes: student outcomes

3.2.1. Bullying perpetration and victimization

At each measurement point, children report on their bullying involvement. For children aged seven through nine there is a single (global) item for bullying perpetration and another one for

Table 2
IMPRES spirit table.

TIMEPOINT	STUDY PERIOD						Close-out
	Enrolment	Allocation	Post-allocation				
	-1	0	Pre-intervention (t0)	Assessing the fidelity of IMPRES support (between t0-t1)	Post-intervention (t1)	Follow-up (t2)	
ENROLMENT:							
Eligibility of schools	X						
Permission from Education Providers	X						
Permission from headmasters	X						
Informed consent from staff members			X	X	X	X	
Informed consent from guardians			X				
Informed consent from students			X		X	X	
Allocation of schools		X					
INTERVENTION:							
KiVa as usual + Received the IMPRES support from T0 to T1	← IMPRES support →						
COMPARATOR:							
KiVa as usual	←						
ASSESSMENTS:							
Socio-demographic information (students and teachers) <i>* only asked once when answering the survey the first time</i>			X		X	X	
School resources and socio-demographic information			X		X	X	
Primary outcomes: - Fidelity			X		X	X	
Secondary outcomes: - Student			X		X	X	
Tertiary outcomes: - Teacher - Administrative - Organisational			X		X	X	
Fidelity of IMPRES support				X			
Focus group interview					X		
ECONOMIC DATA COLLECTION:							
Resource data			X	X	X	X	

victimization, whereas 10–12-year-olds answer six items on each type of involvement. The items are drawn from the revised Olweus Bully/Victim Questionnaire (OBVQ) [35].

3.2.2. Perception of teachers' antibullying attitudes and behaviors

Perception of teachers' antibullying attitudes and behaviors are measured using two (students aged 7–9) or nine items (students aged 10–12) developed for this study. We will assess the psychometric value of the measure before conducting further analysis (e.g., distribution of

each item, Cronbach alpha).

3.2.3. Quality of the KiVa lessons delivered by the teacher

The quality of the lessons is measured with two (students aged 7–9) or five items (students aged 10–12). The questionnaire was developed for this study, and we will assess its psychometric value before conducting further analysis.

3.2.4. Addressing acute bullying cases reported by the students

Older students (aged 10–12) who report meeting with the KiVa team because of their involvement in bullying answer five questions regarding the process, based on which we assess whether the KiVa team has followed the recommended guidelines (only T1 and T2). The child can answer either “yes”, “no” or “I don't know” to each item. A sum score will be computed only for students who provide at least three questions with a “yes” or a “no” answer (i.e., leaving out the answers of children who systematically answer that they do not know).

3.3. Tertiary outcomes

3.3.1. Teacher's cognitions and perceptions

Teachers' Self-efficacy to intervene in bullying is assessed with a 9-item questionnaire developed for another bullying prevention project [36], but which has not been validated yet. We will assess the scale's psychometric properties before conducting further analysis.

Teachers' Moral Disengagement is assessed with a 9-item questionnaire. The questionnaire was developed for this study, and we will assess its psychometric value before conducting further analysis.

Teachers' Perception of Bullying as a Malleable Problem is assessed with an 8-item questionnaire that aims to evaluate teachers' perception of agency concerning bullying among students [29].

3.3.2. Implementation capacity

We develop a questionnaire assessing the implementation capacity of schools and examine its psychometric properties. The preliminary version of the questionnaire has 46 questions forming eight scales. The subscales and example items can be found in Table 1 in the supplemental material. The capacity measure will be used to evaluate individual and organizational level readiness to implement the KiVa program.

3.3.3. Organizational features

Staff members evaluate monitoring, planning and informing at each measurement point. Monitoring is assessed with a 3-item questionnaire (e.g., to which extent school uses and shares the results of the KiVa survey with various stakeholders). Two additional questions are targeted specifically to KiVa team members. Planification of efficient program delivery is assessed using a 4-item questionnaire. Five additional questions are presented to KiVa team members. Finally, the extent to which information about the KiVa program is shared with various stakeholders is measured using a two-item questionnaire. One additional question is targeted to KiVa team members.

3.4. Potential confounders

Children report their age, gender and language spoken at home. Teachers report their age, gender and years of experience with KiVa and in teaching. At the school-level, headmasters indicate the number of students with special needs and of those who need support learning Finnish. We will also consider the region (urban vs rural) and its socio-demographic features as well as the type of consent (active vs passive) as potential confounders in our analysis.

3.5. Statistical analysis

3.5.1. Sample size

We conducted a power analysis to determine the number of schools necessary to reach 80% of power at a two-sided significance level of $\alpha = 5\%$ for our cluster-randomized trial [37]. Recall that schools are our randomization units. Using a well-known sample size calculator [38] we determined that 24 schools would allow detecting a small to medium effect size (i.e., Cohen's d of 0.4) of the intervention on the selected outcomes (i.e., program fidelity). More specifically, we based our calculation on the expected average number of respondents in each school – i.e., 20 staff members based on the estimate that an average

Finnish school has 200 pupils – with a coefficient of variation of school sizes of 0.25. The estimated ICC for the primary outcome was 0.05 and was estimated with the data from the annual KiVa survey answered by all schools implementing KiVa in Finland. We chose this ICC estimate over the one reported by Haataja et al. [19] relying on the initial evaluation of KiVa because our study targets schools that have been implementing KiVa for several years. We also included in our power analysis an adjustment for pre-intervention levels considering a correlation of 0.6 at the classroom-level and 0.7 at the school-level between pre- and post-intervention levels. Finally, our financial as well as organizational resources were also considered when determining the sample size, as mentoring is a resource-intensive working method.

3.5.2. Randomization check

We will compare the intervention and control groups on a wide range of school-, classroom- and student-level variables to test whether the randomization procedure was successful in yielding equivalent experimental groups. First, we will examine whether the level of program fidelity and bullying victimization was similar between our experimental conditions at T0 (i.e., pre-intervention). Then, we will examine whether specific covariates are distributed unequally between our experimental conditions. Specifically, we will examine covariates that are theoretically associated with program fidelity (i.e., primary outcomes) and bullying victimization and perpetration (i.e., secondary outcomes). If differences between experimental conditions are detected at $p < 0.10$, these variables will be statistically controlled for in subsequent analyses. We chose a p -value of 0.10, because meaningful differences of a small or medium amplitude might not raise significant results when comparing characteristics at the school level ($N = 24$).

3.5.3. Handling missing data

All participants with data from at least one wave will be included in our analyses. We will use full maximum likelihood estimates, because this procedure has been shown to yield unbiased coefficients regardless of whether data is missing at random or completely at random [39]. Nevertheless, participants with and without missing data will be compared to document the characteristics of the participants associated with the likelihood of having missing data.

3.5.4. Analytical strategy

Multilevel analysis will be conducted to test our hypotheses; these analyses have the advantages of estimating error terms while considering the nested nature of the data and allowing for missing data [39]. Following an intention-to-treat principle, analyses will thus include all participants (i.e., mentees, students, staff) who completed at least one assessment regardless of how many mentoring sessions the mentees attended (for the experimental groups). In supplementary analysis we will also test a dose-response hypothesis, where the moderating impact of the quantity and quality of the mentoring sessions will be examined on the primary outcomes.

3.5.4.1. Testing the effectiveness of the intervention on program fidelity.

We will use two-level models (i.e., level 1 = teachers or KiVa team members, level 2 = schools) to examine whether the IMPRES condition had higher levels of program fidelity at T1 (i.e., post-intervention). More specifically, we will investigate whether the number of universal lessons is higher in the IMPRES condition than in the control condition. We will also examine the quality of the KiVa lessons according to teachers' own evaluation and by aggregating students' evaluation at the classroom level (average of 20 students per classroom). We will adjust our regressions with the number of universal lessons implemented the previous year (i.e., pre-intervention levels) and the quality of these lessons to gain additional statistical power and focus on the change between pre- and post-intervention.

To examine the effectiveness of IMPRES support on indicated

actions, we will examine whether the KiVa team members report following the recommended guidelines when intervening in bullying cases more in IMPRES schools compared to schools that did not receive IMPRES support. We will conduct the same analysis while using students' reports of how the KiVa team handled their bullying situation. Finally, we will examine whether the KiVa teams in the IMPRES condition were more likely to utilize one of the recommended techniques when addressing bullying cases. To do so, we will first dichotomize the outcome (i.e., follow one of the two recommended techniques) and then use a multilevel model for binary outcome where we adjust for the use of the recommended techniques at T0.

3.5.4.2. Testing the impact of the intervention on student outcomes. We will use a three-level model, as students are nested in classrooms which are nested in schools. We will use student reported bullying victimization at T2 (i.e., 1-year follow-up), as we hypothesize that it may take time for the intervention to have an impact on student level. We will replicate our T1 analysis and discuss the similarity (or lack thereof) of the findings. We will split our sample to perform the analysis on student outcomes, as children aged 7 to 9 have a shorter version of the questionnaire than children aged 10 to 12. Therefore, the number of schools will remain the same ($N = 24$), but the number of classrooms within each school will be restricted to grades 1 to 3 in one set of analysis and to grades 4 to 6 in another set. Pre-intervention levels of bullying victimization will be added as a covariate to isolate the impact of the program on children's reported outcomes.

3.5.4.3. Examining the persistence of the impact of IMPRES support. We will explore whether the associations between IMPRES support and the level of adherence to the universal and indicated actions are maintained at T2 (i.e., a year after providing the support). We will also explore with two-level models whether IMPRES support has an impact on the schools' administrative features (i.e., monitoring, planning and informing) while adjusting for pre-intervention levels of the respective outcome.

3.5.4.4. Examining the cost-effectiveness of the IMPRES support. We will conduct a cost-effectiveness analysis of the IMPRES support compared to KiVa as usual. We will conduct two sets of analyses: one based on student-reported victimization and the other on bullying perpetration experiences. The costs include KiVa and the extra costs resulting from IMPRES support. The time and resource use of the mentors and staff members are monitored. Time use will be monetarized using Finnish unit costs. To conduct an intention-to-treat-based analysis, we will use multiple imputation if needed [40]. We will conduct an incremental net monetary benefit analysis [41] of IMPRES support compared to KiVa as usual.

3.6. Process evaluation

First, a process evaluation will be conducted to explore how the implementation support process unfolded in each school and to identify possible contextual factors influencing it. For this purpose, at the end of each mentoring session, both mentor and mentees were invited to take a short online survey (see examples of items in Supplement Table S1). Descriptive statistics on the school level regarding the progression of the implementation support process will be investigated along with possible differences between mentees' and mentors' evaluations.

Second, focus group interviews were conducted as part of the last mentoring sessions. The interviews are audio recorded and transcribed. The qualitative data will be analyzed by the means of content analysis. The Normalization Process Theory (NPT) [42,43] will be utilized as a standpoint for the data collection and analysis.

Third, we will explore how the association between IMPRES support and the student outcomes at T2 could be explained by program fidelity indicators at T1 using multilevel structural equation modeling.

4. Discussion

In this study, we conduct a cluster-randomized trial to test whether the IMPRES support can improve program fidelity and consequently reduce bullying victimization and perpetration. Furthermore, we investigate the cost-effectiveness of the IMPRES support – as an increase in program fidelity in school context tends to increase costs [44] – and conduct a process evaluation. This trial is innovative, as few studies have investigated how implementation support could improve program fidelity and consequently contribute to a safer school environment (e.g., prevalence of bullying behaviors, teachers' attitude towards bullying).

4.1. Strengths and limitations

One of the main strengths of this trial is the broad spectrum of outcomes assessed at every hierarchical level (i.e., students, teachers, KiVa team members and headmasters). We also aim to examine the potential mechanisms of change, and we rely on a mixed method approach to understand the delivery of the IMPRES support.

However, this trial also has limitations. First, it is likely that only highly motivated schools enrolled in the study. Therefore, the results obtained may not be easily transferable to less motivated school environments. Second, the results of this trial might not transfer to an initial start with a bullying prevention program, since the IMPRES support has been developed to address challenges faced after several years of implementation. Third, we might encounter a floor effect, as the initial prevalence of bullying might have already been low in the participating schools. Additionally, a ceiling effect with respect to program fidelity is possible. Fourth, determining of sample size was influenced by our financial and organizational resources, and a larger number of schools would have allowed detecting small to medium effect sizes. Also, the ICC estimates utilized might be underrated as we recruited motivated schools and there might be considerable heterogeneity among schools taking the KiVa survey upon which we based our ICC estimates. Finally, the power analysis was conducted with the parameters for the universal outcomes (e.g., delivering preventive lessons) which are continuous variables and reported by all staff members delivering them. However, only few respondents reported about indicated actions (i.e., 4–6 members of the KiVa team), and therefore we will have limited power to analyse the impact of IMPRES on these outcomes.

5. Conclusion

The results of this study will provide evidence of the effectiveness of the IMPRES support at improving program fidelity and decreasing the prevalence of bullying in primary schools. By investigating the mechanisms of change, we will be able to identify significant challenges and provide guidelines for the improvement of existing and future bullying prevention programs.

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CRedit authorship contribution statement

Sanna Herkama: Conceptualization, Methodology, Writing – original draft, Project administration. **Marie-Pier Larose:**

Conceptualization, Methodology, Writing – original draft. **Inari Harjuniemi**: Conceptualization, Methodology, Writing – review & editing, Project administration. **Virpi Pöyhönen**: Conceptualization. **Takuya Yanagida**: Methodology, Writing – review & editing. **Eila Kankaanpää**: Methodology, Writing – review & editing. **Elisa Rissanen**: Methodology, Writing – review & editing. **Christina Salmivalli**: Conceptualization, Writing – review & editing, Funding acquisition.

Declaration of Competing Interest

Virpi Pöyhönen and Christina Salmivalli have been part of developing the KiVa antibullying program. Sanna Herkama, Inari Harjuniemi and Virpi Pöyhönen are certified KiVa trainers. They also developed the IMPRES support, and Sanna Herkama and Inari Harjuniemi participated in delivering it for this trial. Marie-Pier Larose, Takuya Yanagida, Eila Kankaanpää and Elisa Rissanen have no competing interests.

Data availability

No data was used for the research described in the article.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.cct.2023.107407>.

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