Implementing health-promoting activities in diverse primary school contexts in the Netherlands: practical lessons learnt

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Abstract

Purpose – To gain insight into factors enhancing or obstructing implementation in various school-settings, which is vital for widespread dissemination and sustainable integration of school-based health-promoting interventions.

Design/methodology/approach – A mixed methods multisite comparative case study to investigate (factors influencing) the implementation of health-promoting activities in twelve Dutch primary schools. Data were collected during three school years (2019–2022) through observations, questionnaires and interviews.

Findings – The project resulted in the implementation of small, incidental activities. Important reasons for the limited implementation were lack of commitment and bottom-up involvement. School directors and teachers were not involved early on in the project, which limited project support and commitment. On school level,

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directors largely carried project responsibility themselves, hindering project sustainability and integration. Coronavirus disease 2019 (COVID-19) made that schools had difficulties forming long-term visions and plans. Other observed barriers included limited perceived necessity to change, high workload and high staff turnover. Important facilitators were the presence of a process coordinator and sharing experiences from other schools.
Originality/value – This research provided valuable insights into (factors influencing) the implementation of health-promoting initiatives in diverse, real-world school contexts. More extensive support is needed to create commitment, bottom-up involvement and a project vision. Furthermore, empowering in-school champions and/or school-wide project groups is desirable to decrease schools' dependence on long-term external support. The findings can be used by various stakeholders throughout development, adoption and implementation and can facilitate widespread dissemination and sustainable integration of school-based health-promoting interventions.

Background

Schools have been identified as key environments for promoting healthy lifestyle behaviours (WHO, 1997, 2017), and over the years, many school-based health-promoting interventions have been implemented and found to effectively improve health outcomes (e.g. body mass index (BMI) and dietary and physical activity (PA) behaviours) (Khambalia *et al.*, 2012; Peterson and Fox, 2007; Sharma, 2006; Sobol-Goldberg *et al.*, 2013; Zenzen and Kridli, 2009). Despite their effectiveness, long-term implementation and/or wide dissemination of these interventions is often not achieved (Keshavarz *et al.*, 2010). This is partly due to a great diversity in school contexts. When implementing school-based health-promoting interventions, there is no "one size fits all" approach (Darlington *et al.*, 2018; Keshavarz *et al.*, 2010). Schools can be defined as complex systems with a unique context and dynamics influenced by various interacting elements from within and beyond the school-setting (Darlington *et al.*, 2018; Keshavarz *et al.*, 2010; Moore *et al.*, 2015). Health-promoting activities that work in one school might therefore not work in another school. In addition, although there are many studies investigating school-based health-promoting interventions' effects (Van Cauwenberghe *et al.*, 2010; Sharma, 2006; Sobol-Goldberg *et al.*, 2013), less research is available on factors influencing implementation, especially in a real-world setting (de Meij *et al.*, 2013; van Nassau *et al.*, 2016). This research gap contributes to a lack of hands-on, practical advice that can be used by schools and other stakeholders interested in implementing school-based health-promoting activities in their context. Gaining insight into factors enhancing or obstructing implementation can explain why an intervention does or does not work in a specific setting and is therefore vital to sustainably integrate health in more schools.

The "Healthy Primary School of the Future" (HPSF) is a previously implemented and evaluated Dutch primary school-based intervention. In two intervention schools, two changes were initiated: (1) daily provision of a free healthy school lunch and (2) daily structured PA sessions after lunch (Bartelink *et al.*, 2018; Willeboordse *et al.*, 2016). Effect evaluations showed significant positive intervention effects on various health outcomes (e.g. BMI z-score and dietary behaviours) (Bartelink *et al.*, 2019b, c; Willeboordse *et al.*, 2022). Following these positive effects, other Dutch primary schools expressed their interest in implementing HPSF-related activities, which created the opportunity to "scale-up" HPSF. Scale-up is "the process by which health-promoting interventions shown to be efficacious on a small scale and/or under controlled conditions are expanded under real-world conditions into broader policy or practice" (Milat *et al.*, 2015). In HPSF's case, this scaling-up meant working with a significantly lower budget than during the HPSF trial and dealing with various schools with complex and unique contexts (Keshavarz *et al.*, 2010). To evaluate the implementation and effectiveness of the HPSF initiative in a scaled-up, real-world setting, the present research project was initiated. In total 12 Dutch primary schools aiming to sustainably implement HPSF-related activities participated in this project. To reflect the real-world situation, participating schools were mainly responsible for the selection and implementation of

activities in their own context, in contrast to the schools participating in the HPSF trial that were subjected to a pre-defined intervention (Willeboordse *et al.*, 2016). This approach stimulated schools to implement health-promoting activities fitting their context, resulting in the implementation of pragmatic, real-world and school-specific activities.

The present study aimed to generate knowledge and experience on how health-promoting activities are implemented in complex and diverse school-contexts and to identify factors influencing this process. This knowledge can subsequently be used to formulate practical advice for schools and other stakeholders involved in the development and implementation of school-based health-promoting activities. Using a mixed methods approach, the present paper aimed to answer the following research questions:

(1) How and to what degree are activities promoting physical activity (PA) and healthy dietary habits implemented in twelve real-world school settings?

(2) Which factors are of influence on the implementation of activities promoting PA and healthy dietary habits in twelve real-world school settings?

Methods

Study design

This study is part of a research project investigating the scaling-up of the HPSF initiative in various school contexts using a non-randomised, non-controlled, observational study design. The project comprises 12 primary schools that are member of one educational board situated in the southern part of the Netherlands. In the present study, a mixed methods multisite comparative case study design was used to provide insight into project implementation in the various schools and to identify influential factors. Data were collected during three school years (2019–2022).

Setting

The educational board expressed its desire to implement HPSF-related activities in their schools. Their aim was that all schools would eventually implement a daily healthy school lunch and structured PA sessions after lunch, corresponding to the main intervention components allocated during the HPSF trial. However, there were various differences between the setup of the HPSF trial and the present project. In the HPSF trial, schools were subjected to a pre-defined intervention developed by a project team consisting of i.a., researchers, schools and municipalities. Also, prior to the start of the HPSF trial, there was large commitment for HPSF across various stakeholders (e.g. schools, local sports clubs and the Municipal Health Services) and extensive funding was provided by provincial authorities to aid implementation (Willeboordse *et al.*, 2016). Although provincial authorities also provided funding for the present project, this was considerably less than in the HPSF trial and was mainly meant for research purposes and the appointment of a process coordinator. Furthermore, there was less widespread commitment across stakeholders prior to the project's start, and schools were free to decide if, when and to what degree they would implement health-promoting activities instead of having to implement a pre-defined intervention. Activities that schools could implement had to fall in at least one of the following categories, formulated by board members and researchers: (1) healthy and sustainable nutrition, (2) sufficient PA, (3) sufficient rest and relaxation and (4) social involvement. Schools were mainly responsible for their own implementation process, but they were aided by a process coordinator. The process coordinator organised regular meetings with directors, managers, teachers and other stakeholders to support implementation and to provide stakeholders with inspiration for possible activities. Researchers played an observing role to gain insight into these processes in a real-world setting.

Data collection
Using a mixed methods approach, quantitative and qualitative data were simultaneously collected. To identify factors influencing implementation in the various schools, the framework by Fleuren *et al.* (2004) was used, a framework previously used in dissemination research in the school setting (de Meij *et al.*, 2013; van Nassau *et al.*, 2016). According to the framework, an innovation process is influenced by characteristics of the socio-political context (e.g. existing rules and regulations), the organisation (e.g. staff capacity, available time and resources), the innovation strategy (e.g. coordination and communication), the innovation's user(s) (e.g. beliefs and perceived support) and the innovation itself (e.g. compatibility and complexity) (Fleuren *et al.*, 2004). This framework and the corresponding Measurement Instrument for Determinants of Innovations (MIDI) served as an inspiration during development of the present study's data collection instruments (Fleuren *et al.*, 2004, 2014). Figure 1 provides an overview of the key outcome domains and components addressed in the present study.

Questionnaires. Two questionnaires were administered yearly in 2019–2022: a school scan questionnaire for school directors and a teacher questionnaire.

School scan questionnaire: Directors of the 12 schools annually filled out a digital questionnaire containing several close-ended questions assessing the presence of health-promoting elements within their school. These elements were divided into four themes: routine (e.g. energisers and parental involvement), policy (e.g. rules on snacks, lunch and sugar-sweetened beverages), education (e.g. amount and duration of physical education (PE) lessons, usage of classroom-based health-promoting programmes) and environment (e.g. presence of a school garden). Additionally, one open-ended question was included to identify other dominating organisational issues (e.g. merging of two schools) potentially influencing a school's project focus.

Teacher questionnaire: All teachers of the 12 schools (n = 114 at T0) were annually invited to fill out a digital questionnaire containing several open-ended questions to gain insight in their health-related practices (focussed on nutrition, PA and rest and relaxation). At T1 and T2, fourteen additional statements based on the MIDI were included (Fleuren *et al.*, 2014). Statements assessing organisational characteristics (n = 9) included questions regarding
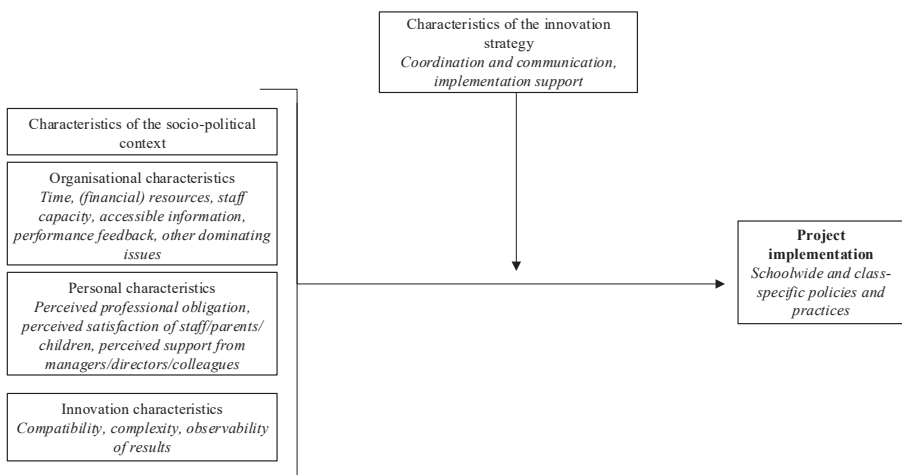

Figure 1.
Key outcome domains and components of the present study

Source(s): Author's own work adapted from Fleuren *et al.* (2014)

staff capacity, available time, financial and material resources, accessibility of project-related information and the presence of regular feedback moments regarding the project. Two statements assessing innovation characteristics were included to evaluate the project's compatibility with the school context and the observability of effects. Statements concerning personal characteristics (n = 3) assessed perceived professional obligation to work on the project, perceived project satisfaction of parents and children, and perceived support from colleagues and managers to work on the project. Response options for each statement ranged from 1 (totally disagree) to 5 (totally agree).

Interviews. In 2020–2022, semi-structured interviews were conducted by one researcher (MH) with the process coordinator and a purposive sample of staff members from each school until data saturation was achieved. The sample consisted of two childcare managers involved in the project, the directors from all schools and one teacher from each school. These teachers were selected based on recommendations by school directors, as they were aware of the degree of project involvement of specific teachers. Due to COVID-19, all interviews were conducted online. The semi-structured interview guides were based on the MIDI (Fleuren *et al.*, 2014). The interviews were used to get an in-depth insight into the schools' project operationalisation and any factors (related to the socio-political context, organisation, innovation strategy, adopting person(s) and/or innovation) influencing implementation. All interviews were held in Dutch and were audiotaped and transcribed verbatim.

Observations and minutes of meetings. MH observed and took notes during all project meetings with the educational board, school directors, working groups with parents and/or teachers and children's voice groups. These meetings and observations were partly on site and partly online due to COVID-19. The observations' aim was to learn about each school's dynamics and implementation and to see and hear factors influencing these processes. To create an open view, no observational checklist was used.

Analyses

Data from interviews, observations and minutes were coded and analysed deductively by MH using NVivo (version 12.0) (Braun and Clarke, 2006). A second researcher (SJ) independently coded and analysed a sample of 12 interview transcripts. MH and SJ discussed their findings and consensus was easily reached. Coding was guided by the five categories from Fleuren *et al.*'s framework (socio-political context, organisation, innovation strategy, adopting person(s) and innovation) and subcategories were created if necessary (Fleuren *et al.*, 2004). During analysis, categories were reviewed continuously and findings were discussed regularly within the research team. Quantitative questionnaire data were analysed using IBM SPSS Statistics for Windows (International Business Machines Corporation Statistical Package for the Social Sciences, version 25, IBM Corp, Armonk, New York, USA). Baseline descriptives from both questionnaires, combined with data from observations and minutes, were used to describe the schools' pre-existing contexts. T1 and T2 questionnaire data were combined with data from interviews, observations and minutes to describe the schools' implementation processes.

Results

Participants

In 2020–2022, 24 digital interviews were conducted that lasted between 30 and 60 min (see Supplementary Table S1 for participants' characteristics). The school scan questionnaire was filled out by all directors at T0-T2. The teacher questionnaire was filled out by 84 teachers (response rate (RR) = 73.7%) at T0, 79 teachers (RR = 69.9%) at T1 and 63 teachers (RR = 61.8%) at T2.

Pre-existing context
All participating schools were member of one educational board and were located in a rural municipality in the southern part of the Netherlands. During the project preparation phase, the educational board's director was replaced by a new director, who mainly focussed on other dominating issues, thereby limiting project development. At T0, this director had recently been replaced by another director who was still director at the end of data collection.

The number of students enrolled in the schools at T0 varied from 31–263. At T0, there were seven directors responsible for 12 schools (some directors were responsible for two schools). Two managers were responsible for the various childcare locations within the schools. Two schools were in a merging process at T0, two other schools were planning to move to a different building and a third school was designing a new school building. The T0 school scan questionnaire revealed that all schools had a nutrition policy, although not every school actively managed this policy. Usage of classroom-based health-promoting programmes was limited, and schools using specific programmes mostly worked with nutrition-related programmes. All schools implemented energisers during the day and all classes engaged in at least one PE lesson per week (although these lessons were not always supervised by a qualified PE teacher). All schools had access to a (more or less) active schoolyard, and one school used a school garden during the school day.

In the T0 teacher questionnaire, the majority of teachers reported to already pay attention to nutrition, PA and/or rest and relaxation in class. These efforts were mainly unstructured; most teachers mentioned paying attention to the subject when it naturally came up during the day (e.g. by discussing students' lunches). Teachers who paid no attention to nutrition, PA and/or rest and relaxation mentioned time constraints, other (education-related) priorities and/or no perceived necessity as main reasons for this lack of attention.

Implementation
The educational board's ambition was that all schools would eventually implement a school lunch and structured PA sessions after lunch. However, due to frequent staff turnover in the board, this ambition was not communicated to school directors, managers and teachers. They received general project information right before the project's start instead of being actively involved during project development. In the first meetings with the process coordinator, various stakeholders therefore felt overwhelmed and were hesitant to implement the school lunch and structured PA sessions. With the process coordinator's help, school-specific plans were formed in late 2019. Most schools wanted to integrate small activities (e.g. the provision of a daily fruit and/or vegetable (FV) item), although some schools had more extensive ambitions (e.g. incorporating cooking lessons in their regular curriculum). Project implementation had just started when the COVID-19 pandemic developed in early 2020. Schools had to deal with forced school closures, high absenteeism and various health- and safety measures, making it impossible to implement all aspired plans and activities. Parents and other volunteers were not allowed within schools for the majority of project duration, which made it difficult to involve these stakeholders and to ensure enough capacity to implement the various plans. Several schools decided to postpone working on the project, whilst others continued implementing activities taking into account the various limitations. Towards the project's end, COVID-19's impact decreased and schools had more capacity to work on the project. Several schools started preparing "bigger" plans and activities. Furthermore, the educational board initiated the formation of a "PA team." The ambition was that this team would be responsible for the provision of PE-lessons and for all other health-related activities in the schools, thereby taking over the process coordinator's role after external project funding ceased. Efforts to further shape the PA team's role were still ongoing at the end of data collection. Table 1 describes the implemented activities at the end of data collection (three years after the project's start).

School	Healthy and sustainable nutrition	Sufficient PA	Sufficient rest and relaxation	Social involvement
1	Daily provision of FV item	(Limited) usage of PA floor for toddlers and pre-schoolers	Incidental yoga lessons provided by pedagogical employee	N/a
2	N/a	- Various staff workshops and information evenings for parents related to PA integration in education - Adaptation schoolyard (more active elements)	Provision of weekly yoga lessons in kindergarten	N/a
3	- Daily provision of FV item - Pilot to investigate healthy lunch provision (not integrated yet)	- Various staff workshops related to PA integration in education - Increased amount of education provided outdoors - Adaptation schoolyard (more active elements) - Pilot to investigate structured PA sessions during lunch break time (not integrated yet)	N/a	- Support from volunteers during lunch pilot and FV provision - Support from local companies to provide lunch during pilot
4	Daily provision of FV item	- Integration of additional 20 min of PA every day (using certified method) - Usage of specific game consoles for outside play	N/a	N/a
5	N/a	N/a	N/a	N/a
6	- Daily provision of FV item - Various activities focussed on healthy nutrition (e.g. Family Food Vlogs, classroom-based quiz, Family Food Experience) - Introduction new school-wide dietary policy	- Adaptation schoolyard (more active elements) - Integration of PA in curriculum	N/a	Active role for students' voice group and parents in nutrition-related plans
7	N/a	- Adaptation schoolyard (more active elements) - Staff workshop regarding reflex integration	N/a	N/a
8	Daily provision of FV item	N/a	N/a	N/a

(continued)

Table 1.
Activities implemented in the various schools at the end of data collection

School	Healthy and sustainable nutrition	Sufficient PA	Sufficient rest and relaxation	Social involvement
9	- Daily provision of FV item - Daily provision of dairy serving - Expansion of school garden	Integration of additional 20 min of PA every day (using certified method)	Development of relaxation spaces throughout the school	Active role for volunteers in maintaining school garden
10	N/a	N/a	Usage of certified method to improve classroom atmosphere	N/a
11	Daily provision of FV item	Integration of additional 20 min of PA every day (using certified method)	N/a	N/a

Note(s): Due to the merging of two participating schools, eleven schools are included in Table 1 instead of the twelve schools that were originally participating in the project

Abbreviations: PA: physical activity; FV: fruit and vegetable and n/a,:not applicable

Source(s): Authors' own work

Table 1.

Influencing factors
In the remainder of the Results section, the most apparent influential factors across the categories from Fleuren *et al*.'s framework (Fleuren *et al.*, 2014) are specified.

Characteristics of the socio-political context
Within the socio-political context, national COVID-19-related restrictions influenced project implementation. Schools were repeatedly obliged to close and after re-opening had to adhere to strict safety regulations (e.g. social distancing). The quickly changing situation often called for ad-hoc decision making, which made it difficult for schools to develop and adhere to a long-term project plan. Furthermore, schools had to deal with high staff absenteeism and parents and volunteers were not allowed to assist during activities in school, which greatly limited schools' capacity to implement activities. The national focus on minimising educational disadvantages following COVID-19 further complicated this matter.

> Director 2,7: "The closure of schools also had an impact. [. . .] There is a different focus now. You now have to investigate which students have an educational disadvantage, how are the children, how did they pull through?" The focus is very much on that instead of on the project."

Organisational characteristics
An important organisational barrier for project implementation was the educational board's lack of project vision. This made it difficult for schools to know what was expected from them and to start developing project plans. The reason for this lack of vision was twofold. First, the educational board was subjected to regular staff turnover at the project's start. These changes made it difficult to develop a long-term project vision. Furthermore, the board perceived it as very important to place project responsibility and ownership within the schools, ensuring that schools could make decisions fitting their context. Communicating a clear project vision whilst protecting schools' freedom was found to be difficult by the educational board.

A vision was also found to be influential on school level. In schools with a clear health-related vision, stakeholders found it easier to form project plans and motivate other staff members. The presence of a clear vision also made it easier to deal with the rapidly changing situation due to COVID-19, as the overall project objective remained clear and adaptations to the plans could be made relatively fast. If a school used their vision to guide implementation, the project was often not seen as an add-on, but as a part of the other ongoing processes within school, and it was less easily dismissed when the school was faced with other dominating issues. Lack of project vision was sometimes the result of time constraints or other priorities within a school. Multiple schools were dealing with high staff turnover and/or efforts to improve educational quality, which limited their ability to consistently focus on the project.

> Teacher 7: "There is a plan to improve educational results across all schools [of the educational board] because that is necessary. That plan currently has the highest priority within our school and probably also in other schools. [. . .] So that is an important factor taking away time and capacity from this project."

In some schools, other dominating issues did not limit project attention, but created a window of opportunity facilitating implementation. A school designing a new school building had the opportunity to incorporate specific health-related concepts (e.g. a large kitchen and an active play yard) in their new building. Also, moving to a new building created the perception of "starting fresh", which resulted in various stakeholders paying extra attention to the school's overall health-related vision and being more inclined to think about bigger activities.

Personal characteristics

Across school directors, who were responsible for the project in most schools, there were differences in perceived project importance and appreciation. Although all directors acknowledged the project's importance, directors with high internal motivation and perceived necessity for change were more successful in involving other stakeholders and implementing activities than directors who felt less personal connection to the subject. These directors were more likely to focus on implementation barriers (e.g. high workload and other priorities), whilst enthusiastic directors looked for opportunities.

> Process coordinator: "For some directors the project is very close to their heart, they want this very much. For others that is not so much the case, but they see the importance and have accepted that they have to work on it. And some directors have little connection to the subject, which decreases their focus on it."

Almost all teachers underpinned the importance of paying attention to health at school, but the project's additional value within this context was not always clear. Various teachers reported to already incorporate health within the curriculum prior to the project and not seeing any necessity for further improvement.

> Teacher 10: [Researcher]: "So there is not really a theme right now that you can think of as something you would choose to work on within the project?" [Teacher]: "No, it is not that we think, "Oh we should do something regarding health!""

This limited perceived necessity for change impeded implementation of disruptive activities. When school directors and teachers were asked whether they were satisfied with the activities implemented at the project's end or if they would have liked to implement more disruptive changes, the majority reported to be content with what was achieved throughout the project.

Innovation characteristics
Clarity of the project's content, aims and operationalisation was suboptimal for school directors, managers and teachers. The large amount of freedom to implement activities made various stakeholders feel overwhelmed and unsure about what was expected of them. Furthermore, the categories in which implemented activities had to fall were not always clear to stakeholders. Especially the categories "rest and relaxation" and "social involvement" were difficult to grasp. The difficulty with these categories was also visible in the activities implemented in the schools (Table 1), as most implemented activities fell in the categories "healthy and sustainable nutrition" and "sufficient PA."

The most-often mentioned aspects playing a role in stakeholders' choice for a specific activity were its degree of compatibility with the school context and its complexity to work with. Several schools chose to work with a specific programme integrating PA within the curriculum, and when asked for their rationale behind this choice, directors and teachers praised the ease of incorporating the programme within their daily practice.

Director 11:"This method is just very easy and clear, which means that teachers do not have to spend a lot of time getting acquainted with it."

Other activities, such as the provision of a school lunch, did not get off the ground because stakeholders perceived them as too complex.

Teacher 3: "Of course we would like to offer a healthy lunch to students, but looking at all the extra work this would bring . . . [. . .] Organisation is a limitation. While I think that all colleagues would like to offer this. But the question is to what extent this would be realistic and feasible."

Characteristics of the innovation strategy
In most schools, project responsibility rested mainly with the school director. Despite efforts of the process coordinator to increase school-wide involvement, directors found it difficult to delegate tasks to their team. They mentioned wanting to "protect" their staff considering the already high work load and limited time.

Director 3: "I am now responsible for the whole project, although I would like to appoint a coordinator. But right now with all the other tasks, I do not delegate it to my team but carry it myself."

This approach led to a lack of bottom-up involvement, and teachers often mentioned not being aware of project details and/or not feeling ownership for their school's plans. Teachers were often informed about an initiative's implementation rather than being involved during preparation. This made the implementation and especially integration of activities extremely difficult due to limited project involvement and ownership amongst staff.

Teacher 7:"It was more a management commitment to work on [the project], we [the staff] were not explicitly asked what we thought about it. It was not that we were very enthusiastic about it."

The lack of bottom-up involvement also made the project largely dependent on one person, which limited sustainability. In schools where teachers were more engaged in implementation, there was clear and regular communication within teams (both in general and regarding the project), which motivated and stimulated staff to be involved.

Teacher 4: "I have to say, the collaboration is great. Everybody is like, "We are going to do this." If we come across a problem, it is discussed, something new is thought of, and we will continue with that."

The process coordinator's presence was vital for project implementation. Whilst schools had to focus on a multitude of subjects (e.g. educational quality, COVID-19 and staff turnover), the

process coordinator had a constant focus on the project and stimulated stakeholders to work on it. Furthermore, she provided schools with inspiration for potential activities.

> Manager 2: "[Process coordinator] makes sure that everybody is up-to-date [. . .] I think that has really been a facilitator, that there is somebody who always has the focus on this despite everything that is happening around us."

Other external project support was also very beneficial, as several schools contacted the Municipal Health Services or other health promotion experts. Furthermore, various interview participants mentioned the positive influence of sharing experiences from other schools working on health promotion.

> Director 8: "The overview which [process coordinator] shared, with all the activities schools are working on, that was very nice. It gives me a lot of energy and makes me think, "Oh I like that as well!""

The experiences from other schools not only served as inspiration, but also provided stakeholders with tips and tricks on how to handle certain situations and even made some stakeholders more willing to work on the project. The positive experiences one school had with a programme integrating PA within the curriculum directly led to two other schools also choosing to implement this programme. Several stakeholders mentioned that they would have liked more knowledge and experience transfer between schools, as they were not aware of all activities implemented within the project. However, this transfer was hindered by COVID-19, which limited the possibility to organise school visits or information meetings.

Table 2 provides an overview of the main facilitators and barriers to the integration of health within the participating schools, as mentioned by school directors, managers and teachers in questionnaires and interviews.

Discussion
The present study examined the implementation of health-promoting activities in multiple real-world school contexts and identified various influencing factors. As opposed to the majority of implementation research on health-promoting schools, no pre-defined intervention was provided in the present project. Rather, schools were encouraged to implement activities fitting their context, wishes and needs.

Overall, the original project ambitions were not met and limited implementation was observed. The most important reasons for this were related to *project commitment and bottom-up involvement*, repeatedly identified as key factors in the implementation of school-based health-promoting programmes (Bartelink *et al.*, 2019a; de Meij *et al.*, 2013; van Nassau *et al.*, 2016). Lack of project commitment and bottom-up involvement were observed at different stages and on different levels (project level, educational board level and school level). On project level, there were clear differences between the original HPSF trial and the present project. The original HPSF trial's project team worked extensively on creating *commitment* for and *involvement* in HPSF across school directors, teachers, parents, children and the school environment (Bartelink *et al.*, 2019a, b, c; Willeboordse *et al.*, 2016). These efforts were made to a much lesser extent in the present project. Given the educational board's initial enthusiasm, it was hypothesised that schools would share this enthusiasm and would involve relevant stakeholders. However, in many schools, enthusiasm about the project was less than anticipated and limited time and/or efforts were spent on involving relevant stakeholders. Given the importance of stakeholder involvement for sustainable implementation (Bartelink *et al.*, 2019a, b, c; Deschesnes *et al.*, 2003; Durlak and DuPre, 2008; Pearson *et al.*, 2015), for future projects it is crucial to provide schools with more extensive guidance and support on how to adequately do this (van Dongen *et al.*, 2022). A process coordinator could play a more

Category	Facilitators	Barriers
Socio-political context		COVID-19-related restrictions (e.g. school closure, safety regulations and national focus on limiting educational disadvantages) and the corresponding complexity of the constantly changing situation at school
Organisation *(school)*	- Clear health-related vision within the school - Window of opportunity (e.g. designing a new school building)	- Lack of attention for the project due to other dominating issues (e.g. staff turnover and relocation) - Limited time available for the project due to already full curriculum
Personal *(school directors, managers, teachers)*	- Internal motivation to incorporate health within the school context (e.g. as a result of high perceived importance of the subject) - Availability of a "coordinator" (school director or other staff member) with continuous attention to the project who can stimulate other team members	- High (perceived) workload - No perceived necessity for incorporating health within the school context
Innovation	Compatibility of an activity with the regular curriculum	- Limited clarity of the project as a whole (e.g. its aims and operationalisation) - Complexity of an activity (e.g. time and effort needed to prepare implementation)
Innovation strategy	- Clear and regular communication within teams - Coordination and support from process coordinator who keeps the project alive within the schools - External project support (e.g. from local health promotion experts) - Sharing ideas and experiences across schools	- Top-down decision making, resulting in lack of involvement of various stakeholders

Source(s): Authors' own work

Table 2.
Main facilitators and barriers to the integration of health within the participating schools

proactive role in this, e.g. by organising regular meetings to ensure project involvement and commitment of all relevant stakeholders from the beginning.

On educational board level, there was enthusiasm about HPSF and the ambition to implement comparable activities in their schools. However, the decision to participate in the present project was not made in collaboration with school directors and/or teachers. Rather, these stakeholders were merely informed about project participation, indicating a low level of bottom-up involvement at the project's start. Furthermore, the board's project vision and ambitions were not clearly communicated to the schools. As a result of the board's lack of guidance, most school directors felt overwhelmed by the freedom of choice they had when developing school-specific plans, which negatively influenced their project commitment and involvement. *Leadership engagement* (e.g. through setting and communicating clear project boundaries, expectations and goals) has previously been described to facilitate the implementation of various school-based programmes (Bast *et al.*, 2017; Domitrovich *et al.*, 2011; Lane *et al.*, 2022; Wilhelm *et al.*, 2021).

Leadership engagement was not only suboptimal at educational board level, also on school level there was room for improvement. Most school directors carried the project largely by themselves and were hesitant to involve their team as this could further increase their already high workload. This greatly limited bottom-up involvement and project integration within

schools, as other staff members were not aware of the project's details and experienced limited ownership and/or motivation to work on it. In various schools, it was observed that bottom-up involvement in general was limited: school directors took the lead in most decision-making, whilst staff members played a less-proactive role. These dynamics might, therefore, have been part of the schools' general culture. To change this culture, external project support should be more equipped to support and guide schools extensively in stimulating bottom-up project involvement as the present study showed that schools find it difficult to do this on their own.

In most schools, teachers were already satisfied with their students' health status and the amount of attention payed to health before the project. This might have limited their *perceived necessity to change*, which is an important factor in the decision to implement health-promoting activities (Durlak and DuPre, 2008; van Nassau *et al.*, 2016). Focussing on health benefits might therefore not always be the right strategy to create commitment for health integration in schools. It is important to use information fitting a school's specific context and needs when trying to motivate them to work on health promotion. In some schools, this might be information regarding health benefits, but in other schools, this could, e.g. be mentioning the opportunity for a school to distinguish itself from other schools.

COVID-19 and its subsequent restrictions also had a negative influence on project implementation. Approaching the project with a long-term plan was difficult as the situation called for many ad-hoc decisions. This contributed to a lack of project vision, motivation and stakeholder involvement, thereby impeding sustainable implementation of health-promoting activities in schools (Bartelink *et al.*, 2019a, b, c; Cassar *et al.*, 2019; de Meij *et al.*, 2013; van Nassau *et al.*, 2016). Schools that were more successful in dealing with these barriers approached the project with a *clear health-related vision* and had *regular communication* within the team. Through this approach, they perceived the project as an "add-in" rather than an "add-on."

A facilitating factor was the presence of the *process coordinator*, who stimulated stakeholders to work on the project through sharing other schools' experiences and providing information regarding potential activities. However, schools needed extensive guidance for which the process coordinator not always had enough time as she had to guide all participating schools. For widespread dissemination of school-based health-promoting activities, it might, therefore, be better to first focus on schools in which there is already some motivation to work on the subject. The school's drive is an important foundation for successful implementation and focussing attention on fewer schools provides more room to concentrate on creating commitment and bottom-up involvement. The experiences of motivated schools can subsequently be used to stimulate other, less internally motivated schools to work on the subject.

To make widespread and sustainable dissemination feasible, schools should rely less on external project support and feel empowered to work on the subject independently. To achieve this and to facilitate integration within schools, it is important to identify and train in-school champions and/or school-wide project groups. These people should be enthusiastic about the subject and have the skills, power and knowledge to involve and activate other staff members to work on the subject. The importance of identifying and empowering organisation champions to successfully scale up public health interventions has been described previously in other comparable research within and beyond the school-setting (Carson *et al.*, 2014; van Dongen *et al.*, 2022; Lane *et al.*, 2022; van Nassau *et al.*, 2016; Naylor *et al.*, 2015; Simmons and Shiffman, 2007).

Strengths and limitations
The strength of this study was the mixed methods approach, which stimulated data triangulation and complementation (Bartelink *et al.*, 2019a, b, c; Schifferdecker and Reed, 2009). In addition, usage of Fleuren *et al.*'s framework (Fleuren *et al.*, 2014) facilitated comparison with other studies using the same framework (de Meij *et al.*, 2013; van Nassau *et al.*, 2016). Furthermore, following diverse schools in their natural setting allowed for a real-

world insight in project implementation. This provided a valuable addition to the process evaluation of the original HPSF trial (a more controlled situation) that was previously performed (Bartelink *et al.*, 2019a, b, c). It should, however, be noted that all participating schools were member of the same educational board and were located in the same municipality. To further increase the experience base, it would be beneficial to investigate implementation in schools from other educational boards and/or located in different areas.

A limitation of the present study is the fact that only one researcher conducted the interviews. The risk of social desirability was minimised by stressing confidentiality and the fact that participants could not give any wrong answers and by carefully formulating interview questions. To reduce bias related to the subjective interpretation of qualitative data, two researchers coded (part of) the interviews, notes were kept on researchers' objectivity, ambiguities during coding were discussed with colleagues and data interpretation was done in collaboration with two other researchers.

Implications for practice
Figure 2 provides an overview of important activities to be undertaken by various stakeholders throughout development, adoption and implementation of school-based health-promoting projects. All activities are based on important influential factors observed in the

Figure 2.
Overview of activities to be undertaken by various stakeholders throughout project development, adoption and implementation

Source(s): Author's own work

present study and in comparable research (Bartelink *et al.*, 2019a, b, c; Cassar *et al.*, 2019; Domitrovich *et al.*, 2011; Lane *et al.*, 2022; de Meij *et al.*, 2013; van Nassau *et al.*, 2016; Naylor *et al.*, 2015).

Conclusions

The present project's original ambitions were not met. This was due to several reasons, the most important being a lack of commitment creation, bottom-up involvement and project vision on several levels (project level, educational board level and school level). This, together with issues such as high staff turnover, COVID-19 and high workload, resulted in the implementation of small activities with limited focus on long-term integration. For future projects, it would be beneficial to provide more extensive support at the start of the project to create commitment, bottom-up involvement and a project vision. Furthermore, identifying and empowering in-school champions and/or school-wide project groups should be a priority to decrease schools' reliance on extensive long-term external project support and to facilitate project integration and widespread dissemination.

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(The Appendix follows overleaf)

Supplementary

	N	%
Stakeholder interviewed	23	
School director	7	29.2
Childcare manager	2	8.0
Teacher	13	54.2
Other[a]	1	8.0
Gender interviewee	23	
Male	8	34.8
Female	15	65.2

Table S1.
Characteristics of
interview participants

Note(s): [a]Process coordinator (who was interviewed at two different moments to discuss the project's progress)
Source(s): Authors' own work

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