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Process Evaluation of a Work Stress Prevention Approach in Primary Education

Exploring the Added Value of Real-Time Feedback During Implementation

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Objective: Participatory organizational-level interventions carry a risk of implementation failure. The current study evaluates the implementation of a work stress prevention approach in primary education and reflects on the use of real-time feedback as implementation strategy to prevent this risk. **Methods:** The process evaluation was conducted at four primary schools in the Netherlands. A framework for evaluating organizational-level interventions was applied using mixed methods. **Results:** Results show the implementation level varied between schools and was hindered by the intervention context, school size, and planning of the approach. Management commitment and employee involvement seemed important factors for successful implementation. Real-time feedback seemed valuable to further improve implementation, but not to prevent implementation failure. **Conclusions:** Collecting data on implementation factors before the active phase of the approach, may provide the possibility to anticipate on implementation problems earlier.

Keywords: implementation, process evaluation, organizational intervention, monitoring

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LEARNING OUTCOMES

- Evaluate the implementation process of a work stress prevention approach in primary education
- Reflecting on the use of real-time feedback as part of the implementation strategy of the approach to prevent the risk of implementation failure

Work stress is considered a common problem among teachers.[1] In 2021 in the Netherlands, 21% of the workers in (primary) education reported work stress.[2] At the same time there is a scarcity of teachers, and high levels of stress may increase the risk of turnover.[3,4] Considering the high prevalence of work stress, its potentially severe consequences by causing, for example, mental health problems[5] and the scarcity of teachers, effective work stress interventions in education are needed.

Participatory development and implementation of organizational interventions is the recommended approach to manage psychosocial risks at work.[6–9] An example of such an approach that holds potential to sustainably decrease work stress, is the participatory organizational-level work stress prevention approach.[10,11] In this approach, work stress risks are identified and organizational measures to reduce these risks are planned and implemented by a working group consisting of representatives of all employees within the organization. There are several ways by which this approach can contribute to decreasing work stress. First, planning and implementing appropriate measures that target work stress risks at their source will eliminate these risks and consequently decrease work stress.[10] In addition, the participatory approach is believed to empower employees to actively improve their working conditions[12,13] and secures that planned measures fit in with the organizational culture.[14,15] Finally, the cyclical nature of the approach is supposed to contribute to the self-learning ability of organizations to improve working conditions and to manage work stress in the long term.[16,17]

Despite all potential benefits, the implementation process of these types of approaches is notoriously difficult and effects of the approach rely on the success of the implementation process,[11] which according to Nielsen & Randall,[16] is determined by the design and realization of action plans (Is the approach executed according to plan? Are planned measures implemented?), the implementation strategy (Is management committed? Are employees informed and involved?), the intervention context (Does the context facilitate of hinder the approach?) and participants' mental models (Are employees ready for change?).

An important step of these types of approaches is the implementation of action plans.[18] During this 'active phase' action plans are implemented and regularly discussed among members of the organization and reviewed to make adaptations when needed. According to Nielsen et al,[19] this step is essential to achieve sustainable change as it provides opportunities to integrate learning into practice. A study by Tafvelin et al[20] showed that employee participation and (perceived) management commitment during this phase is critical to achieve the targeted outcomes. However, in practice especially during the active

phase, it is often difficult to keep employees and management committed, informed, and involved.[11]

A possible solution suggested by Tafvelin et al[20] is to continuously measure the implementation process to identify needs for adjustments in order to ensure successful implementation. Similarly, Nielsen et al[19] suggest to provide feedback to the organization based on data collected during the intervention to enhance implementation and optimize potential effects of the intervention. Providing feedback on important aspects of the implementation process to implementers during implementation of the approach provides the opportunity to tailor measures as well as their implementation when necessary. This could reduce the risk of implementation failure and lead to more successfully implemented approaches.

The current study describes a process evaluation of a work stress prevention approach that was implemented in primary education. As part of the implementation strategy of the studied approach, real-time feedback in relation to (perceived) management commitment, employee involvement, communication, and readiness for change was provided to schools to facilitate the working groups during the implementation phase. The study aims to answer two research questions:

(*RQ1) How successful is the implementation of the work stress prevention approach in primary education?*

The implementation success is determined regarding the design and realization of action plans, the implementation strategy, the intervention context, and participants' mental models. On each of these aspects requirements are formulated that have to be met for the approach to be considered successfully implemented.

(*RQ2) What is the value of real-time feedback as part of the implementation strategy of the work stress prevention approach?*

The value of the real-time feedback as part of the implementation strategy is determined based on the collection of real-time monitoring data, change in implementation factors over time, value of feedback according to implementers, and actions taken by implementers based on real-time feedback.

MATERIALS AND METHODS

This process evaluation was conducted alongside a quasi-experimental study on the effectiveness of a work stress prevention approach among employees in primary education. The study protocol is reviewed by the Medical Ethics Review Committee of VU University Medical Center. The requirement for approval was waived by the ethics committee, as the Medical Research Involving Human Subjects Act does not apply to the current study. All employees received information about the study and signed an informed consent for the study activities. Detailed information on the methods and intervention can be found elsewhere.[21]

Study Population

The study population for the process evaluation consists of teaching and nonteaching staff (ie, managers, support staff) from four schools in primary education in the Netherlands that fall under the scope of two school foundations. All schools of the two school foundations received an invitation, and a maximum of four schools (2 large schools and 2 small schools) could participate in the approach. The first schools that applied were in fact a large school and a small school from each school foundation. After their application the recruitment procedure was closed. These four schools (total number of employees working at baseline: N = 102) followed the five steps of the work stress prevention approach.

Work Stress Prevention Approach

The work stress prevention approach consists of five steps (see Fig. 1).

During Step 1 (2 months) at each school, *a working group* was formed consisting of the school principal and 2 to 3 employees, which was responsible for action planning (Step 3) and implementation (Step 4).

During Step 2 (12 months), causes of work stress at the schools were identified by means of focus group meetings (2 focus group meetings with 3 to 5 employees per school). In addition, a logic model of change was developed by the research team based on Intervention Mapping,[19] by (i) setting a program objective, (ii) identifying performance objectives (behavioral) actions needed to accomplish the program objective, (iii) identifying determinants for the performance objectives, and (iv) selecting (behavioral change) methods to target the determinants.

During Step 3 (6 months) possible measures were inventoried by means of participatory focus group meetings at each school with all employees. Based on the results of the focus group meetings and the logic model of change the research team developed a general action plan for all schools. This general action plan included several appropriate possible measures and the rationale behind these measures. At each of the schools, the working groups selected and specified measures from the general action plan into a school specific action plan.

During Step 4 (12 months), the measures from the action plan (intervention activities) were implemented by the working groups. During implementation, action plans could be changed if deemed necessary. Working groups received monthly input on the implementation process from feedback reports based on real-time monitoring data collected by monthly pulse surveys (see data collection) among all employees of their schools. During their recurrent meetings, working groups could reflect on the feedback reports and use them to optimize implementation and tailor the action plan if needed.

During Step 5 (2 months), the implementation of the work stress prevention approach was evaluated in a process evaluation.

Framework for Process Evaluations of Organizational-Level Interventions

In the current study, Nielsen & Randall's framework for process evaluations of organizational level interventions was applied.[22] This framework describes different aspects to be considered in a process evaluation. The general process factors as described in the framework were specified and tailored to the specific objectives of the approach and translated into requirements for successful implementation. Because monitoring and feedback were important parts of the implementation strategy of the studied approach, the framework was expanded with an extra implementation factor 'monitoring and feedback'.

Data Collection

Table 1 provides an overview of implementation factors based on the framework of Nielsen & Randall[22] that were measured, requirements that have to be met for the approach to be successful and measurements used to answer RQ1. To answer RQ2, the response on the pulse surveys was tracked and changes in implementation factors over time and differences between schools during the implementation phase were measured with monthly pulse surveys during the realization of action plans. Interviews during Step 5 contained questions on the use of the feedback reports. Actions taken by working groups as a result of the feedback reports were logged in the research log.

Questionnaires

All employees received an invitation by email to participate in a web-based questionnaire at T0 (baseline), T1, before the implementation of actions (1-year follow-up) and T2, after implementation of actions (2-year follow-up). Time lags of 12 months were chosen because effects were expected to occur within this time frame.[23] The items listed below were included for the process evaluation, with response scales of all items ranging from 1 = *not at all* to 5 = *to a very large extent,* except for the item on Satisfaction, which response scale ranged from 1 = *poor* to 10 = *excellent*.

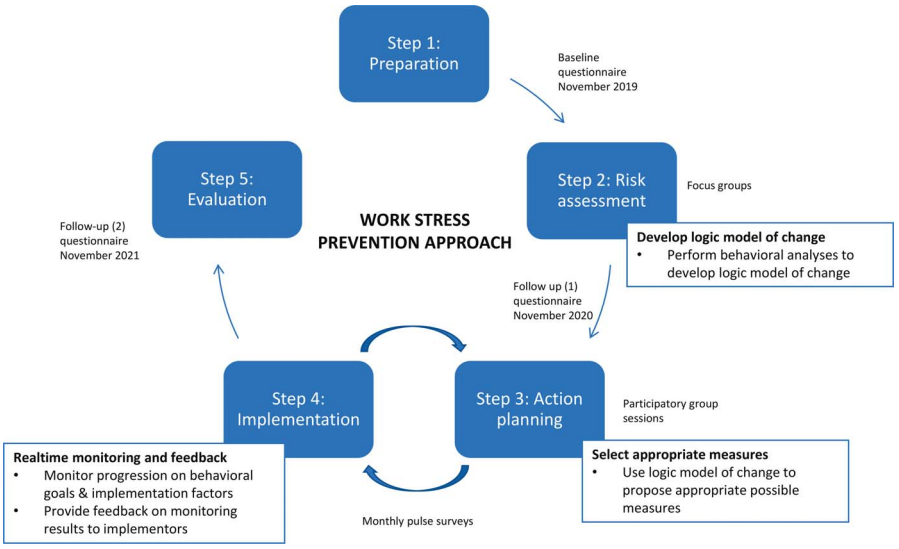

FIGURE 1. Schematic overview of work stress prevention approach.

Implementing measures was measured at T2 by 1 item based on the Intervention Process Measure (IPM)[24]: "*I have noticed that measures and/or changes have been implemented as a consequence of [the project].*"

Management commitment was measured at T2 by 1 item based on the IPM[24]: "*I have the feeling that the school principal is positive about [the project].*".

Employee involvement was measured at T2 by 2 items based on the IPM[24]: "*I have been involved in [the project],*" "*I could contribute ideas about the measures that are taken as part of [the project].*"

Information and communication was measured at T2 by 2 exploratory items: "*I am aware of the objectives of [the project]*" and "*I was informed about the progress of [the project].*"

Mental models were measured at T0, T1 and T2 by 2 items: "*Work stress of employees at our school is a problem that should be addressed*" and "*I am confident that [the project] will bring me something*".

Satisfaction was measured at T2 by 1 exploratory item: "*To what extent are you satisfied with [the project]*"?

TABLE 1. Implementation Factors, Requirements for Successful Implementation, and Data Source

		Data Source		
Implementation Factor	**Requirements for Successful Implementation**	**Questionnaire (Employees)**	**Interview (Principal and Employee)**	**Research Logs (Researchers)**
Design and realization of action plans				
Fidelity	*Main activities of the approach are executed according to plan (ie, installing working group, participation in focus group meetings, behavioral analyses, developing of action plans, regular meetings working groups and implementing measures)*		X	X
Appropriateness of measures	*Measures as part of the action plans target the main work stress risks and are considered appropriate*		X	X
Realization of action plans	*All measures as part of the action plans are implemented*		X	X
Implementation strategy				
Monitoring and feedback	*Feedback regarding the implementation of measures is provided to working groups and resulted into actions to improve implementation*		X	X
Management commitment	*There was commitment and support from managers during the approach*	X	X	X
Employee involvement	*Employees participated in decision making during the approach*	X	X	X
Information and communication	*Information was provided to participants during the implementation of the approach*	X	X	X
Context				
Omnibus context	*The intervention did fit in with the culture and/or conditions of the school*		X	X
Discrete context	*No events took place that hindered the implementation of the approach*		X	X
Mental models				
Readiness for change	*Participants were ready for change during the approach*	X		X
Appraisal of the intervention and its activities (eg, satisfaction)	*Participants were satisfied with the approach*	X	X	X

Interviews

As part of Step 1 of the approach two interviews were conducted per school with the school principal and an employee, to collect background information about the school organization and culture (omnibus context). The face-to-face interviews ($n = 8$) were conducted according to a semistructured interview protocol (see annex 1, http://links.lww.com/JOM/B646) and lasted between 30 and 45 minutes. To collect data on the design and realization of action plans, the discrete context, and the use of feedback reports as part of the implementation strategy two interviews were conducted per school as part of Step 5: one interview with the school principal, and one interview with an employee. Interviews were conducted according to a semistructured interview protocol (see annex 1, http://links.lww.com/JOM/B646), by video call ($n = 8$) and lasted between 30–60 minutes.

Research Logs

In the logbook, planned and unplanned events were registered alongside the impressions of the researchers based on observations during focus groups, working group meetings and periodic telephonically updates between researchers and school principals and meetings with the advisory board.

Real-Time Monitoring (Pulse Surveys)

During the implementation of measures (Step 4) with a duration of 9 months from March to November 2021 (excluding summer holidays in August), all employees of the schools received 8 short surveys that they could fill in with an app they had to install on their smartphones. The following items were included in the monthly pulse surveys for the process evaluation, with response scales of all items ranging from 1 = *not at all* to 10 = *to a very large extent*.

Management commitment, Employee Involvement, and Information and Communication were measured with the same items as included in the T2 questionnaire.

Readiness for change was measured by three items based on the Questionnaire Climate of change Processes and readiness[25]: "*I am willing to actively contribute to [the project]* (intentional readiness for change), *"I expect that [the project] will help to reduce my work stress"* (cognitive readiness for change) and "*I have a positive feeling about [the project]"* (emotional readiness for change). Response scales range from 1 = *not at all* to 10 = *to a very large extent*.

Data Analyses

Questionnaires and pulse surveys data were analyzed with SPSS (IBM Corp. Released 2023. IBM SPSS Statistics for Windows, Version 29.0.2.0 Armonk, NY: IBM Corp) 29[26] using statistic descriptives (mean, standard deviation). Because of the limited number of employees at the schools and a high level of turnover in between measurements, data from new respondents at T1 and T2 were included in the analyses. Interviews were analyzed following a deductive approach of thematic analysis.[27] During all interviews, minutes were made by a researcher and processed into transcripts that were analyzed. Interview transcripts were thoroughly read through and textual segments were coded according to the themes from Nielsen and Randall[22] theoretical framework for process evaluations. The extracted segments were digitally tracked in Microsoft Excel voor Microsoft 365 MSO (Version 2308 Build 16.0.16731.20542).

Data from research logs were used to analyze events that occurred regarding the discrete context. Data collected with questionnaires, interviews and research logs were analyzed at aggregated level (data of the schools combined) and school level, to provide a picture of the level of implementation overall and per school.

Pulse surveys data were analyzed at school level to conduct feedback reports for the working groups and provide a picture of changes in implementation factors overtime. Because of privacy agreements with the schools, questionnaire and pulse surveys data were only reported from groups with a minimum of 10 participants.

RESULTS

Descriptives (RQ1)

The total number of employees employed at the primary schools fluctuated between the baseline, 1-year, and 2-year follow-up questionnaires (see Table 2). In total, 89 (87%), 85 (79%), and 54 (48%) employees responded to respectively the baseline, 1-year, and 2-year follow-up questionnaires. The number of respondents varied between the schools (see Table 2). Given the criterion of at least 10 participants per group, no T2 questionnaire data can be reported for school B and D.

Overall Results (RQ1)

Per school for each implementation factor it was assessed to what extent it met the conditions for successful implementation (see Table 3; for detailed results see annex 2, http://links.lww.com/JOM/B646). The implementation of the approach was most successful in school A, least successful in school D, and partly successful in school B and C.

Design and Realization of Action Plans (RQ1)

Fidelity

Overall the requirements for fidelity of the approach were partly met. According to interview data and research logs, at three of the four schools (school A, B and C) the main activities of the approach were executed according to plan. At school D, the school principal did not succeed in installing a working group due to a high work load of the employees. During the implementation phase, school D withdrew from active participation in the research project and decided from that moment onwards to only participate in the T2 questionnaire measurement, but not to implement measures. The reason for this decision was that the pace of the approach was too slow and did not match with the planning of the school. Due to a change in management at school C at the time of the action planning, the selection of school specific measures at this school was delayed with a month. At school A and B, periodic meetings were held with the working

TABLE 2. Response to Questionnaires

	T0 Total N	T0 Response n (%)	T1 Total N	T1 Response n (%)	T2 Total N	T2 Response n (%)
All schools	102	89* (87%)	106	85* (79%)	113	54* (48%)
School A	36	34 (94%)	37	32 (87%)	36	23 (64%)
School B	14	11 (79%)	15	10 (67%)	14	>10
School C	33	29 (88%)	32	23 (72%)	29	13 (35%)
School D	19	13 (68%)	22	17 (77%)	24	>10

*Unspecified schools: at T0 $n = 2$, at T1 $n = 3$, at T2 $n = 1$; missing values on implementation measures: at T2 $n = 2$.

TABLE 3. Summary of Level of Implementation per School

Implementation Factor	Requirements for Successful Implementation	School A	School B	School C	School D
Design and realization of action plans					
Fidelity	*Main activities of the approach are executed according to plan (ie, installing working group, participation in focus group meetings, behavioral analyses, developing of action plans, regular meetings working groups and implementing measures)*	Yes	Yes	Partly	No
Appropriateness of measures	*Measures as part of the action plan target the main work stress risks and are considered appropriate*	Yes	Yes	Partly	No information
Implementing intervention activities	*All measures as part of the action plan are implemented*	Yes	Partly	Partly	No
Implementation strategy					
Monitoring and feedback	*Feedback regarding the implementation of measures is provided to working groups and resulted into actions to improve implementation*	Yes	Partly	Partly	No
Management commitment	*There was commitment and support from managers during the approach*	Yes	Yes	Partly	No
Employee involvement	*Employees participated in decision making during the approach*	Partly	Partly	Partly	No
Information and communication	*Information was provided to participants during the implementation of the approach*	Yes	Yes	Partly	No
Context					
Omnibus context	*The intervention did fit in with the culture and/or conditions of the school*	Yes	Yes	Yes	Yes
Discrete context	*No events took place that hindered the implementation of the approach*	No	No	No	No
Mental models					
Readiness for change	*Participants were ready for change during the approach*	Partly	Partly	Partly	Partly
Appraisal of the intervention and its activities (eg, satisfaction)	*Participants were satisfied with the approach*	Yes	No information	Partly	No information

group on a regular basis. At school C, meetings with the working group were held sporadically.

Appropriateness of Measures

At all schools, the interviewed school principals and employees indicated that the identified work stress risks did reflect the most important issues. Work stress risks that were identified during the risk assessment were related to job demands (eg, high administrative load, high demands from parents), organizational resources (eg, social support, team culture), and personal resources (eg, feelings of incompetence, difficulties to prioritize tasks or set personal boundaries). At school A, B, and C, the school principals and employees indicated that the selected measures were appropriate to target the most important work stress risks. Examples of measures are as follows: training to communicate with parents (to decrease demands from parents and increase setting boundaries), team building activities (to increase social support and team culture), individual coaching sessions (to decrease feelings of incompetence), reduce overlap in administrative tasks (to reduce administrative load), redivide tasks based on ambitions, and competences (to support prioritizing tasks) (see Table 4). However, interview data revealed that there were doubts among the interviewees whether these types of measures could completely solve work stress at the schools. In their view, some of the most important work stress issues (eg, administrative burden, too many children per class) cannot be fixed at school level.

Realization of Action Plans

The number of measures from the action plan that was carried out varied between the schools. At school A, all intended measures were carried out, whereas at school B and C, because of a lack of time and other priorities (primarily caused by the COVID-19 pandemic), most measures were carried out, but not all.

Implementation Strategy (RQ1)

Management Commitment

Results of the T2 questionnaire show that 77% of the employees believed their school principal was positive about the approach (school A: 100%, school C: 54%). Interview data also show that school principals differed in their level of commitment toward the approach. The principals of school A and B were very committed toward the approach from start to end. Since a change in management took place during the action planning phase, the principal of school C was less committed to the approach because the principal was not involved from the start of the project and it was not a top priority during the onboarding period. The principal of school D was committed at start, but the commitment decreased when the planning of the approach lacked behind the school schedule and did no longer match with the school planning.

Employee Involvement

Results of the T2 questionnaire show that overall 50% of the employees felt involved in the approach (school A: 70%, school C: 38%), whereas 31% of the employees felt they had been able to think along with the measures (school A: 30%, school C: 31%). Interview data showed that employees at school A and B felt involved in the approach, whereas employees at school C felt less involved, and employees at school D felt not involved at all. At school C, the switch in management impacted the priority that was given to the approach, which consequently might have impacted the employee involvement. At school D, a lack of communication about the approach toward

TABLE 4. Measures as Part of the Action Plans at the Schools

School	Action Plans
A	• New format progress interviews with employees
	• Monitoring overload with wearable
	• Training communication with parents
	• Proactive offering individual coaching sessions
	• Providing compliments
	• Document with taken measures/policies to prevent work stress
	• Possibility of scheduled days off for administrative tasks
B	• Limiting accessibility outside working hours
	• Communication guideline for parents
	• Monitoring overload with wearable
	• Facilitating time for administrative tasks
	• Making appointments about administrative tasks
	• Colleague consultation
	• Determining school vision to prioritize work tasks
	• Improving physical working environment
C	• Rearranging work tasks based on capabilities and ambitions
	• Monitoring overload with wearable
	• Team building activities (sporting together)
	• Exploring preparation of lessons together
	• Quality card with guidelines for communication
D	• Exploring change in school time table
	• Document with taken measures/policies to prevent work stress
	• Management present at evenings with parents
	• Sharing successes
	• Changes in communication year calendar

employees decreased the level of involvement. According to employees, taking part in the monthly monitoring increased their awareness of the approach and their level of involvement overall.

Information and Communication

Results of the T2 questionnaire show that 75% of the employees felt informed about the objectives of the approach (school A: 87%, school C: 54%), and 67% felt informed about the progress of the approach (school A: 91%, school C: 38%). Interview data reveal that the frequency of communication about the approach was high at school A. At this school, regular information updates were provided from the school principal and the working groups to the rest of the team by means of emails, newsletters, or updates during team meetings. At school B and C, the communication about the approach toward employees was less frequent. At school D, the level of communication about the approach toward employees was considered insufficient.

Intervention Context (RQ1)

Omnibus Context

The four schools differed in size. School B and D were considerably smaller than school A and C. Interview data reveal that the small schools had more difficulties to form a working group (school D did not succeed), because there was not enough capacity to perform the working group tasks. At school A, there already was an existing, good functioning working group at the start of the research project, which facilitated the functioning of the working group at that school.

Discrete Context

The implementation phase coincided with the outbreak of the COVID-19 pandemic. During the pandemic, schools were under strong pressure to continue the provision of education to students by teaching from home. At the start of the implementation phase (January 2021), the Netherlands was in lockdown, and schools provided education remotely. In April 2021, schools opened again, but the schools had to deal with sick children and employees, forcing schools to improvise to ensure the provision of education. In October and November 2021, the number of COVID-19 infections in the Netherlands was rising again, putting even more pressure on schools to continue their classes. Interview data and research logs reveal that the COVID-19 pandemic played a hindering role in implementing measures from the action plans. The switch to home schooling, staff dropout, sick parents and children, and continuously changing policy measures from the Dutch government had schools to constantly improvise to ensure the provision of education, pushing the active implementation of the approach in some schools to the background, especially at school B and C.

Mental Models (RQ1)

Readiness for Change

Questionnaire results show that the urgency to tackle work stress risks among employees was high, and relatively stable across all measurements (T0: 85%, T1: 87%, T2: 83%). School A and C showed a somewhat different pattern. At school A, this percentage was 85% at T0, and increased to 91% at T1, and decreased to 78% at T2. At school C, this percentage was 83% at T0, decreased to 74% at T1 and decreased further to 69% at T2. At school B and D, the urgency to address work stress risks remained relatively stable between T0 and T1 (school B T0: 91%, T1: 90%, and school D T0: 92%, T1: 94%; no data are available at T2).

Questionnaire results show that overall the perceived benefits of the approach fluctuated overtime (T0: 48%, T1: 61%, T2: 48%). School C showed a pattern similar to the overall pattern (T0: 48%; T1: 65%; T2: 38%), whereas school A showed a somewhat different pattern. At school A, the number of respondents that perceived benefits of the approach was relatively high at T0 (65%), remained relatively stable at T1 (69%) and decreased at T2 (57%). At school B, the percentage of employees that believed they would benefit from the approach at T0 was 50%, and this remained relatively stable at T1 (50%) (no data are available at T2). At school D, the percentage of employees that believed to benefit from the approach at T0 was low (8%), but this increased to 53% at T1 (no data are available at T2).

Appraisal of the Approach

Employees rated their satisfaction with the approach with M = 6.3 (on a scale from 1 = very unsatisfactory to 10 = very satisfactory). Employees from school A were more satisfied with the approach (M = 6.8, range: 3–10) than employees from school C (M = 5.9, range: 2–8). Strengths of the approach that were mentioned in the interviews were dialog on work stress risks within the schools and the continuously planning, monitoring and evaluating of measures to address work stress risks.

Value of Real-Time Feedback (RQ2)

During the realization of measures from the action plans, monthly feedback reports were provided to the working groups when at least 10 employees participated in the pulse surveys. Table 5 shows the response per school. Because at school D no measures were carried out, no relevant pulse survey data are available. Because of a delay in the planning, only two of the schools (school A and B) participated in the first pulse survey. The number of respondents that participated in the pulse surveys varied greatly between the schools (see Table 5) and impacted the number of feedback reports that could be provided to the working groups.

Figure 2 provides a picture of implementation factors (management commitment, employee involvement, communication, and readiness for change) over time at school A and C, based on the pulse surveys data with more than 10 respondents per time point. Results show that during the action planning and implementation phase of the approach school, the scores on the implementation factors differed between the schools. School A scored higher on all implementation factors as compared to school C. Differences between schools were

especially high for management commitment and considerably lower for readiness for change. Overall no major changes in implementation factors occurred during the action planning and implementation phase of the approach. At school A, for most of the implementation factors, there was a small drop after the summer holiday (September), at school B most implementation factors dropped 1 month later (October).

At school A, the working group received monthly feedback reports of each of the measurements. At school B, the working group only received a feedback report of the first measurement. At school C, the working group received monthly feedback reports of each of the measurements except the one in July (only 6 respondents).

Based on the interviews, at school A, the monthly feedback reports were considered valuable and provided input for reflection on the action plan. One time the report provided insight into a new issue that occurred on which action was promptly taken by the working group. Two times the report showed a decrease in employees' perception of the communication on the approach. As a result extra attention was provided to the approach in newsletters, emails and meetings. At school B, the monthly monitoring was considered less valuable: since it was a relatively small school, the minimum of 10 participants was difficult to accomplish and the working group only received one feedback report with results of the first measurement. At school C, the reports of the first measures were considered valuable, but over time the response decreased and the reports were not discussed within the working group anymore.

TABLE 5. Monthly Pulse Surveys Data

	School A (n = 37 at T1)	School B (n = 15 at T1)	School C (n = 32 at T1)
No. unique participants (response %)	29 (78%)	13 (87%)	19 (59%)
Max. no. participants per measurement (response %)	26 (70%)	10 (66%)	16 (50%)
Min. no. participants per measurement (response %)	17 (46%)	5 (33%)	6 (19%)
Average no. times of participation per participant	6.0	5.0	4.7
Mean no. participants per measurement (response %)	21.6 (58%)	8.1 (54%)	12.7 (40%)

DISCUSSION

The first aim of this article was to describe the results of a process evaluation of a work stress prevention approach that was implemented in four primary schools in the Netherlands and to identify drivers and barriers for implementation. Regarding RQ1, the results of the process evaluation reveal that there are remarkable differences between the schools in the level of implementation of the approach. At one school the implementation was successful, at two schools the implementation was partly successful, and one school completely withdrew from active participation during the action planning phase and did not implement measures as part of the approach. Therefore, the implementation at this school was not successful.

Based on the results of the process evaluation, there are several factors that are assumed to have hindered or facilitated the implementation of the approach. For all schools, the *context* impacted the implementation of the approach. Although the outbreak of the COVID-19 virus contributed to the urgency to address work stress risks, the pandemic hindered the implementation of the action plans. Dealing with acute stressors caused by the COVID-19 pandemic pushed the planning of organizational measures to the background. Whereas the COVID-19 pandemic placed an extra burden on all schools, some schools had more difficulties to implement measures than other schools. At the schools where management commitment was high, more measures were implemented and the implementation of measures was less hindered by the COVID-19 pandemic.

The *school size* may have impacted the success of the implementation of the approach as well. Small schools had difficulties installing a working group and planning and implementing measures, because at these schools the capacity to carry out tasks related to the approach was limited. In addition, for small schools, it was difficult to reach the threshold of 10 respondents on the monthly measurements and therefore these schools did not receive feedback reports. For this reason, small schools did not benefit much from the monthly monitoring. This may imply that for small organizations monthly pulse surveys are not a suitable method and alternative forms of monitoring and feedback may be more appropriate. It could also be argued that small organizations might be in less need of such a tool at all, because of communication is often easier in smaller teams.

Regarding the level of *employee involvement*, results were somewhat inconclusive. More than half of the employees from the schools felt involved during the approach, whereas only one third of the employees felt they were able to think along with the measures. This finding was consistent across all schools. This is an interesting finding because at each school a majority of employees participated in focus group sessions in which they could propose measures. The fact that, in practice, a large proportion of employees did not feel involved in thinking along with the measures may imply that their suggestions were not sufficiently taken into account, or employees were not sufficiently informed about the way their proposed measures were included in the action plan, or that they did not recognize their proposed measures in the action plan. Difficulties with informing and involving employees during all steps of the approach were also found in previous research.[11] Considering the importance of direct involvement of participants in intervention decision making,[28] the form and frequency of involvement of participants could be reconsidered (eg, by involving more employees in the selection of proposed measures). In addition, if managers provide more information on how and why proposed measures are (not) included in the action plan, this might increase the employees' feelings of involvement and consequently their commitment toward the approach.

The level of perceived *management commitment* seemed to have impacted the implementation of the approach as well. Schools where the management was very involved realized most measures, and at these schools, the employees were also the most informed and satisfied with the approach. In schools where the approach (and in particular the action plan) was given less priority by the management, fewer measures were realized and communication about the approach toward employees was less frequent. At these schools, employees experienced less positive results of the approach. These findings are in line with the mechanism of senior management support impacting the level of employee participation, intervention adherence, and outcomes, as described by others.[15,20] These findings once again stress the importance of managers as drivers of change in these kinds of approaches.[29] Because, in primary education in the Netherlands, the level of turnover by management is quite high, additional interventions might be needed to secure the commitment of new managers to the approach (eg, by investing in employee involvement, for example by making employees lead of the working group, as a means to force new managers to prioritize the approach). This requires more research on ways to secure management commitment in case of management changes during interventions.

The *planning* of the approach may also have impacted the implementation of the approach. Within this study, the timing of the steps of the approach in terms of activities and planning (eg, planning of the measurements) were more or less fixed and the same for all four schools for reasons of practical feasibility. As a result, schools sometimes had to wait until they could move on to the next step resulting

FIGURE 2. Management commitment, employee involvement, communication, and readiness for change during action planning and implementation phase of the approach based on pulse surveys. Note: Given the criterion of at least 10 participants per group, no pulse surveys data can be reported for school B and D, and the July measurement of school C.

in a loss of support and momentum at times. For one of the schools, a loss of momentum due to the fact that the pace of the approach was too slow for the urgent need to make rapid changes in relation to the school planning, resulted in a decision to withdraw from active participation in the approach. Connecting or tailoring the activities of the approach to existing processes within the school could possibly facilitate the planning of the approach. By ensuring that the steps follow each other smoothly and that they can be continued if the support is high, the chance of a successful approach can be increased. Nevertheless, it can make the application of a rigorous evaluation study more difficult. It is a common area of tension to ensure a research design that makes it possible to draw reliable conclusions based on objective data and that at the same time also fits the reality of often changing circumstances within organizations.

The second aim of the study was to reflect on the use of real-time feedback of the implementation process to facilitate working groups to optimize implementation when needed. Based on previous research,[20,30] the authors were interested to explore if real-time monitoring and feedback could be a valuable method to signal implementation problems the moment they occur and take timely action, preventing implementation failure.

The value of the real-time feedback was considered to depend (among others) on the pulse surveys' response, and the insights on changes in implementation factors that the monitoring data would provide. However, the relatively small number of employees at the schools and low response on the pulse surveys resulted in a lack of monitoring data, which limited the value of the real-time feedback. Based on monitoring data that was collected, implementation factors showed a similar pattern overtime and seemed to be highly correlated, complicating the specification of actions needed to prevent implementation failure.

Despite the limited monitoring data, the real-time feedback seemed to be of value for schools that already were successful in implementing the approach, supporting them in optimizing the implementation even further. For them, a drop in implementation factors functioned as early warning signal and was a trigger for taking action to maintain successful implementation. In addition, interviews revealed that taking part in the pulse surveys increased employees' feelings of involvement in the approach. However, at schools where implementation of the approach was less successful, it seemed that implementation problems (lack of employee involvement and readiness for change) had already occurred before the action planning phase, which probably also resulted in a low response to the monitoring. Regarding RQ2, the results of this study suggest that real-time feedback during the realization of the action plans may indeed facilitate the implementation, but the benefits depend on the level of response on the monthly measurements, which is related to employee commitment to the approach. Especially when implementation fails, feedback could be useful to improve implementation. However, when implementation failure is related to a decrease in employee commitment this will impact the response on the monthly measurements and consequently the quality of the monthly feedback reports. Collecting data on implementation factors before the active phase of the approach may provide the possibility to anticipate on implementation problems earlier. In addition, other monitoring methods that are less dependent on all employees to actively participate might be better options to solve this problem, for example, by working with a panel of employees,[30] interviewing a selection of employees and/or aligning the monitoring more closely with the primary processes within the organization.

More research on suitable methods for monitoring implementation and detecting implementation hindrances covering all phases of the approach is needed. From a research perspective, good quality monitoring data on implementation processes could also provide a more detailed picture on changes in implementation factors overtime and interrelations between implementation factors from a time-sensitive perspective.[13,19] This type of data could be useful to determine which implementation factors are most important to focus on to avoid implementation failure and may also contribute further to our understanding of the implementation processes of these kinds of approaches. In addition, to make more impact in organizational practice would require more research on the practical feasibility of real-time monitoring and feedback, as well as practical tools that could be easily used by organizations to monitor the implementation process themselves, without the supervision of researchers.

Strengths and Weaknesses

There are several strengths and weaknesses of this study that should be taken into consideration. A strength of the study is that, to our knowledge, it is among the first studies to investigate the value of real-time feedback as part of the implementation strategy of a

participatory organizational-level intervention and to reflect on the use of real-time monitoring to study the implementation process during the active phase of the approach.

Another strength of the study is that the process evaluation was carried out according to the framework for process evaluations of organizational-level interventions.[22] For this study, an additional implementation factor 'monitoring and feedback' was added to the framework because this was an important aspect of the implementation strategy. Although the framework is extensive and it requires substantial effort to collect good quality data on all relevant aspects of the implementation, using the framework provided theoretical and practical guidance as well as more insight into how implementation factors (eg, management commitment, employee involvement, communication, readiness for change) facilitated or hindered the development and implementation of the approach. Adding the implementation factor 'monitoring and feedback' to the framework provided relevant information on the action planning and implementation phase of the approach, and can be a valuable contribution to the process evaluation framework.

A third strength is that the study used an extensive mixed methods approach (questionnaires, interviews, data logs, monthly pulse surveys) to evaluate the implementation of the approach. Quantitative measures were appropriate for comparisons of implementation factors between the schools, whereas qualitative measures provided more detailed information on the implementation process and the relation between implementation factors. Combining different forms of data collection provided a more detailed and complete picture of the implementation process than would have been the case if only quantitative of qualitative data were used.

A weakness of the study is, however, that (due to the COVID-19 pandemic) the response to the T2 questionnaire was low. As a result, for two of the four schools there was not enough quantitative data from the T2 measurement. This impacted the possibilities to compare the implementation process of the approach between the schools.

Another limitation is that the schools included in the study were not randomly selected, but they voluntarily applied to participate. Their willingness to address work stress and their commitment from the management to the approach at start may not be representative for all schools. The fact that even these schools did not all succeed to implement the approach successfully also raises some concerns about the broad applicability of these types of approaches to prevent of decrease work stress.

Recommendations for Practice

Based on the results of this study, several reflections can be made on the implementation of organizational-level work stress prevention approaches. This study confirms once more the difficulty of successful implementation of these types of approaches. In line with other studies, implementation of the approach appears most successful in schools where the level of employee involvement, management commitment and communication were already sufficient at the start of the project. As suggested by Roodbari et al[15] this may imply that a certain level of employee involvement, management commitment, readiness for change and communication is required at the start of these approaches to be successful. Measuring these factors not only during implementation, but also before the start of the project, as also suggested by Nielsen et al[31] might be necessary to determine the 'organizational readiness' to successfully implement the approach, and take tailored action to increase these implementation factors if needed before starting the approach. During the approach, monitoring methods that do not depend on employee involvement might be better suited to measure implementation failure and take timely action. More research is needed on suitable methods and measures for this purpose.

CONCLUSIONS

This study presented the results of a process evaluation of a work stress prevention approach that was implemented in four primary schools in the Netherlands. Results show the implementation level varied between schools and was hindered by the intervention context, school size, and planning of the approach. Management commitment and employee involvement seemed important factors for successful implementation. In addition, the study explored the value of real-time feedback as part of the implementation strategy of the approach. Results suggest that real-time feedback to implementers could be valuable to further improve implementation but has not proven to prevent implementation failure in its current form. Data on implementation factors during all phases of the approach could potentially signal implementation problems earlier and could provide a more detailed picture of the implementation process evolving over time.

REFERENCES

1. Tang CS, Au W, Schwarzer R, Schmitz G. Mental health outcomes of job stress Among Chinese teachers: role of stress resource factors and burnout. *J Organ Behav* 2001;22:887–901.
2. Van den Heuvel, SG, van Thor JAF, Fernandez Beiro L, van Dam LMC & Dirven HJ. Nationale Enquête Arbeidsomstandigheden 2021: in vogelvlucht. Leiden/ Heerlen: TNO/ CBS; 2022.
3. Perrachione BA, Rosser VJ, Petersen GJ. Why do they stay? Elementary Teachers' perceptions of job satisfaction and retention. *Prof Educ* 2008;32:n2.
4. Weiss EM. Perceived workplace conditions and first-year teachers' morale, career choice commitment, and planned retention: a secondary analysis. *Teach Teacher Educ* 1999;15:861–879.
5. Harvey SB, Modini M, Joyce S, et al. Can work make you mentally ill? A systematic meta-review of work-related risk factors for common mental health problems. *Occup Environ Med* 2017;74:301–310.
6. Irastorza X, Milczarek M. Cockburn. Second European Survey of Enterprises on New and Emerging Risks (ESENER-2) Overview Report: Managing Safety and Health at Work. Luxembourg: European Agency for Safety and Health at Work (EU-OSHA); 2016.
7. International Labour Office (ILO). Guidelines on occupational safety and health management systems (ILO-OSH 2001). Geneva, Switzerland: ILO; 2001.
8. UK Health and Safety Executive.Managing the Causes of Work-Related Stress: A Step-by-Step Approach Using the Management Standards. 2nd ed. Sudbury, UK: HSE Books, 2007.
9. World Health Organization. WHO Guidelines on Mental Health at Work; World Health Organization: Geneva, Switzerland; 2022.
10. Nielsen K, Randall R, Holten A, González ER. Conducting organizational-level occupational health interventions: what works? *Work Stress* 2010;24:234–259.
11. Bakhuys Roozeboom MC, Schelvis RMC, Houtman ILD, Wiezer NM, Bongers PM. Decreasing employees' work stress by a participatory, organizational level work stress prevention approach: a multiple-case study in primary education. *BMC Public Health* 2020;20:676.
12. Nielsen K, Randall R, Albertsen K. Participants' appraisals of process issues and the effects of stress management interventions. *J Organ Behav* 2007;28: 793–810.
13. Nielsen K, Noblet A. Organizational interventions: Where are we, where do we go from here? In K Nielsen & A Noblet (Eds.), Organizational Interventions for Health and Well-Being: A Handbook for Evidence-Based Practice. London: Routledge/Taylor & Francis Group; 2018.
14. Peters SE, Nielsen KM, Nagler EM, Revette AC, Madden J, Sorensen G. Ensuring organization-intervention fit for a participatory organizational intervention to improve food service workers' health and wellbeing: workplace organizational health study. *J Occup Environ Med* 2020;62:e33–e45.
15. Roodbari H, Axtell C, Nielsen K, Sorensen G. Organisational interventions to improve employees' health and wellbeing: a realist synthesis. *Appl Psychol* 2022;71:1058–1081.
16. Nielsen K, Abildgaard JS. Organizational interventions: a research-based framework for the evaluation of both process and effects. *Work Stress*. 2013; 27:278–297.
17. von Thiele Schwarz U, Nielsen K, Edwards K, et al. How to design, implement and evaluate organizational interventions for maximum impact: the Sigtuna Principles. *Eur J Work Organ Psy* 2020;30:415–427.
18. Augustsson H, von Thiele Schwarz U, Stenfors-Hayes T, Hasson H. Investigating variations in implementation fidelity of an organizational-level occupational health intervention. *Int J Behav Med* 2015;22:345–355.
19. Nielsen K, De Angelis M, Innstrand ST, Mazzetti G. Quantitative process measures in interventions to improve employees' mental health: a systematic literature review and the IPEF framework. *Work Stress*. 2022;37:1–26.
20. Tafvelin S, von Thiele Schwarz U, Nielsen K, Hasson H. Employees' and line managers' active involvement in participatory organizational interventions: examining direct, reversed, and reciprocal effects on well-being. *Stress Health* 2019;35:69–80.

21. Bakhuys Roozeboom MC, Niks IMW, Schelvis RMC, Wiezer NM, Boot CRL. Design of a participatory organizational-level work stress prevention approach in primary education. *Front Psychol* 2022;13:827278.
22. Nielsen K, Randall R. Opening the black box: presenting a model for evaluating organizational-level interventions. *Eur J Work Organ Psy* 2013;22:601–617.
23. De Lange* AH, Taris TW, Kompier MA, Houtman IL, Bongers PM. The relationships between work characteristics and mental health: examining normal, reversed and reciprocal relationships in a 4-wave study. *Work Stress* 2004;18:149–166.
24. Randall R, Nielsen K, Tvedt SD. The development of five scales to measure employees' appraisals of organizational-level stress management interventions. *Work Stress*. 2009;23:1–23.
25. Bouckenooghe D, Devos G, Van den Broeck H. Organizational change questionnaire–climate of change, processes, and readiness: development of a new instrument. *J Psychol* 2009;143:559–599.
26. SPSS I. *No title. IBM Corp.Released, Statistics for Windows, Version 25.0.* Armonk, NY: IBM Corp; 2017.
27. Clarke V, Braun V, Hayfield N. Thematic analysis. In J Smith (Ed.), Qualitative psychology: A practical guide to research methods (3rd ed.). London: Sage; 2015.
28. Lehmann AI, Bauer GF, Brauchli R. Intervention effects for direct and indirect participants in an organisational health intervention: a mixed-methods study. *Work & Stress*. 2022;36:1–25.
29. Nielsen K. Leaders can make or break an intervention – but are they the villains of the play? In K Kelloway, K Nielsen and J Dimoff (Eds.), Leading to occupational health and safety: How leadership behaviours impact organizational safety and well-being. Chichester, UK: Wiley; 2017.
30. Lien M, Saksvik PØ. Healthy change processes—a diary study of five organizational units. Establishing a healthy change feedback loop. *Stress Health* 2016;32:258–269.
31. Nielsen K, Marzocchi I, Di Tecco C, et al. Validation of the intervention preparedness tool: a short measure to assess important precursors for successful implementation of organisational interventions. *Work Stress*. 2023;1–19.

