The art of balance: addressing occupational stress and well-being in emergency department nurses

Wijn, A.N. de

“Het is een zwakte om aan te geven als je ergens mee zit. Of het nu gaat om een heftige gebeurtenis of omdat je gewoon te veel werk hebt.”

- SEH-verpleegkundige, juli 2017 -

“Er lopen hier ook wel mensen rond die heel cynisch zijn, en dan denk ik wel dat er te weinig aandacht is voor wat het werk met de medewerker doet.”

- SEH-verpleegkundige, juli 2017 -

“Wij hebben geen peer support of enige opvang. Medewerkers gaan gewoon door. Dat gaat me echt aan het hart. Er wordt nu wel naar gekeken. Tot nu toe is dat niet gebeurd omdat de cultuur gewoon zo is.”

- SEH-verpleegkundige, juni 2018 -

“Als senior management waren we erg ontdaan van de uitslagen. Met name burnout. Voor het personeel leek het minder een verassing. We hebben het gevoel dat we niet goed hebben geluisterd en proberen nu meer in gesprek te gaan hierover. Er is een dagstart en dagevaluatie ingevoerd en we zijn meer alert op het evalueren van heftige casuïstiek.”

- Manager spoedeisende hulp, juli 2018 -

“Het direct management probeert van alles
maar loopt daarboven ook tegen een muur aan.
Veel dingen lijken op hoger niveau niet mogelijk.”

- SEH-verpleegkundige, augustus 2019 -

“We worden op zich wel betrokken bij veranderingen.
Hoe vaak we hier wel niet post-its hebben geplakt en hoeveel
werkgroepen er wel niet waren met allemaal goede ideeën.
Maar uiteindelijk wordt er niets uitgevoerd of is er niets
mogelijk. Het wordt gewoon niet gedragen door de
organisatie. Dat werkt echt frustrerend.”

- SEH-verpleegkundige, augustus 2019 -

“Hogerhand zou langer mee moeten lopen op de afdeling.
Twee uur is niet voldoende om een goed beeld te krijgen van
de drukte hier. Er zou meer aandacht moeten komen vanuit
hoger management voor de arbeidsbelasting.”

- SEH-verpleegkundige, augustus 2019 -

CHAPTER 5

Psychosocial Safety Climate as predictor for the implementation process of a large-scale stress management intervention project in the Netherlands

Manuscript under review
de Wijn, A. N. & van der Doef, M. P. Psychosocial Safety Climate as predictor for the implementation process of a large-scale stress management intervention project in the Netherlands.

Abstract

Psychosocial Safety Climate (PSC) refers to a climate in which all levels of the organization are committed to employee well-being. The current study investigates whether PSC predicts the number and fit of actions, information provision, employee involvement, and positive appraisals in a stress management intervention project in 15 Emergency Departments in the Netherlands. Employee surveys were conducted at T1 (January/February 2017), T2 (June/July 2018), and T3 (June/July 2019) to assess PSC, information provision, employee involvement and positive appraisals. A standard form and follow-up telephone interviews were used to inventory the number and fit of actions taken by each ED. Multilevel analyses showed that PSC at T1 was positively related to information provision and employee participation, but not to positive appraisals at T2. Neither PSC at T1 nor a change in PSC between T1 and T2 predicted the number or fit of actions in the following year. This is one of the first studies assessing PSC as prerequisite for successful intervention implementation and shows its importance with respect to information provision and employee involvement. Future research in other settings and integrating other contextual factors (e.g. financial resources, staffing levels, mental resources) next to PSC, is warranted.

Background

Stress management interventions (SMIs), especially organization-directed interventions focusing on improving the working environment and/or work processes, often show little to no effect on employee well-being (Richardson & Rothstein, 2008; Ruotsalainen et al., 2015). In an attempt to understand and increase the effectiveness of these interventions, several researchers strongly suggest adopting a realist approach in SMI research, not only assessing the outcome but also investigating how the intervention was implemented (i.e. processes or mechanisms) and under what circumstances (i.e. the context) (Biron & Karanika-Murray, 2014; Nielsen & Miraglia, 2016). An important proposition of this approach is that the outcome of an intervention depends upon the activation of important mechanisms which can be hindered or facilitated by the organizational context, also referred to as the Context-Mechanism-Outcome (CMO) framework (Hewitt et al., 2012).

Up till now, research on SMI studies provides quite some evidence regarding what mechanisms need to be activated for intervention success, including the design of fitting interventions to the context and current risk factors (Albertsen et al., 2014; Nielsen & Randall, 2015), senior and direct management support for the intervention project (Jenny et al., 2015; Nielsen, 2017; Nielsen & Noblet, 2018), clear communication about the intervention activities (Nielsen & Randall, 2013; Nielsen & Noblet, 2018; Saksvik et al., 2015), employee participation in designing and implementing interventions (Abildgaard et al., 2018; Nielsen & Randall, 2012) and positive attitudes towards and perceptions of the intervention project (Jenny et al., 2015; Nielsen & Randall, 2013; NytrØ et al., 2000). However, our understanding is far more limited regarding the organizational context necessary to trigger these mechanisms. Up till now, contextual factors are often reported in the discussion sections in terms of disturbing factors or noise, but hypotheses regarding their influence are rarely formulated and tested (Nielsen & Miraglia, 2016; Nielsen & Noblet, 2018). Based upon a review of the literature, Nielsen and Noblet (2018) concluded that in order to develop, test and revise CMO-configurations in SMI research, more research on contextual factors is needed. To address this gap, the current study explores the role of Psychosocial Safety Climate (PSC), in activating mechanisms in a two-and-a-half year (2017-2019) stress management intervention project among multiple emergency departments (EDs) in the Netherlands.

Psychosocial Safety Climate

Psychosocial Safety Climate (PSC) is an organizational climate factor and concerns the policies and practices regarding psychosocial safety which is reflected in four domains, 1. management prioritizes psychosocial safety, 2. management is committed and supportive in reducing psychosocial risks at work, 3. there is upwards (from employees to management) and downwards (from management to employees) communication regarding psychosocial risks, and 4. all parties (management, employees or their representatives, human resources, occupational safety representatives) are involved in reducing psychological risks at work (Hall et al., 2010). More recently, a favorable group norm towards psychosocial safety has been added as a fifth dimension (Bronkhorst, 2015; Bronkhorst & Vermeeren, 2016). In organizations with a favorable PSC, management values and consequently prioritizes employee well-being above other competitive (often productivity related) goals. According to the theory of PSC, this in turn leads to the instalment of manageable job demands, adequate job resources, and safe socio-relational aspects of work, which has a positive effect on employee well-being (Dollard & Bakker, 2010). Indeed, multiple studies have found evidence for this theory (Bronkhorst & Vermeeren, 2016; Dollard & McTernan, 2011; Zadow et al., 2017), and as such, PSC is often referred to as "cause of causes" (Loh et al., 2020).

PSC as a predictor of mechanisms in an intervention project

In line with the notion of PSC as "cause of causes", there is reason to believe that a favorable PSC is an important prerequisite for a successful SMI project by activating mechanisms related to greater intervention success.

First of all, a key aspect of a favorable PSC is the priority given by and commitment of management towards psychosocial safety over other competitive goals (Dollard & Bakker, 2010). As such, it is to be expected that organizations with a more favorable PSC are more likely to allocate time, budget and support to an intervention project aimed to reduce stress and increase employee well-being. These resources are crucial in the translation of identified risk factors into concrete intervention plans, and the development and implementation of actions during the SMI project (Biron & Karanika-Murray, 2014). Indeed, management is regarded the main driver of the implementation phase in SMI projects and studies show that a lack of management support can lead to limited, or even a reversal of, implemented intervention activities (Nielsen & Noblet, 2018).

Second, in organizations with a favorable PSC there is open communication and commitment on all layers of the organization to reduce psychosocial risks at work. As a result, employees in these organizations feel safe to discuss psychosocial risks with their supervisor, whereas employees in organizations with a less favorable PSC have found to be more hesitant due to the fear or repercussions (McLinton et al., 2018). With regards to intervention implementation, a safe and open environment is seen as crucial condition for the development of fitting actions to psychosocial risk factors (Biron & Karanika-Murray, 2014). In contrast, in a context where management and/or employees feel uncomfortable to discuss stress-related issues, the process of finding appropriate solutions is much more difficult and more likely to be unsuccessful (Biron & Karanika-Murray, 2014; Gemzøe Mikkelsen et al., 2011).

Apart from the number and fit of actions, it is to be expected that a favorable PSC has a positive impact on how the actions are implemented, including factors such as information provision and employee involvement. First of all, previous research shows that management that is concerned by and committed to psychosocial safety is more likely to provide employees with the time necessary to participate in intervention projects as well as motivate employees to make changes to their working conditions (Gray et al., 2019; Tafvelin et al., 2019), and employees in these organizations are more likely to be involved in intervention projects (Greasley & Edwards, 2014). Furthermore, in a study by Mikkelsen and Saksvik (1998), the same intervention triggered employee participation in an organization with a culture based upon co-operation, common interest and continuous improvement, but not in an organization where employees believed that it was the job of management to solve their problems. In line with these results, it has been found that the participatory process was more difficult to trigger in organizations in which employees were not used express their concerns regarding psychosocial risks (Mikkelsen et al., 2000) or be included in problem solving (Aust et al., 2010; Mikkelsen et al., 2000).

Finally, PSC is likely to be of influence on the attitudes and appraisals of employees towards an SMI project. Although the influence of contextual factors like organizational climate on mental models has received little attention in SMI research, the relationship has been well studied and acknowledged in the field of organizational management (Weiner, 2009). For example, in organizations where innovation is an important part of the culture, employees are more positive towards change (Weiner, 2009). Since employees are more likely to accept and

support activities when they perceive that these originate from shared norms, values and beliefs, (Hogg, 2001), it is to be expected that in organizations with a more favorable PSC, employees will be more positive towards activities to reduce stress and improve well-being. In comparison, conducting such projects in settings where health and well-being are less prioritized, may lead to skepticism and even negative appraisals of the project (NytrØ et al., 2000).

Previous research on the influence of PSC in activating mechanisms

According to our knowledge, only one previous attempt has been made to study the influence of PSC on activating important mechanisms in an SMI project. In 2012, Dollard conducted a pilot study to assess whether PSC could be considered an important starting condition in a participative intervention in two governmental organizations. The results indicated that PSC at the workgroup level was positively related to the number of intervention sessions attended, the intervention quality (i.e. the extent to which employees felt they had been listened to), and the intervention progress (i.e. the extent to which actions of the action plan had been implemented). The latter is in line with the expectation that a positive PSC facilitates resources and thus action taking in an intervention project. However, PSC was measured 6 weeks after the initial intervention workshops had taken place, which makes it difficult to draw conclusions regarding a cause-response relationship; the participatory intervention may have already resulted in a better PSC. Furthermore, no validated questionnaire for PSC was used, as such a questionnaire was first developed and introduced after publication of the study. On another note, Dollard (2012) measured PSC at the beginning of the project. However, PSC as an organizational climate factor, represents a momentary state which is likely to fluctuate over time (Cox & Flin, 1998). As such, it is possible that PSC is not only an important starting condition as concluded by Dollard (2012), but also a dynamic factor triggering or hindering mechanisms depending on the direction of change during the intervention project.

Current study

The current study aims to test the first proposition of the CMO framework and builds upon the work of Dollard (2012) by assessing whether PSC activated mechanisms in a 2.5-year intervention implementation project among multiple Emergency Departments (EDs) in the Netherlands. The project consisted of a risk assessment, yearly feedback regarding (changes in) psychosocial risks and employee well-being, and inspiration sessions to support and

stimulate EDs in designing and implementing actions. Data was collected in three waves (T1: January/February 2017, T2: June/July 2018; T3: June/July 2019) with respectively 18 and 12 months in between. In this study, we specifically focused on the number and fit of actions, information provision, employee involvement, and positive appraisals, as we expect that these mechanisms will most likely be activated by a favorable PSC context and play an important role in the effectiveness of the current project. Although we are aware that "management support" is also widely recognized as an important mechanism in the success of SMI projects, given its overlap with PSC (i.e. management commitment and priority to reduce psychosocial risks at work), this process variable was not included in the current study. In comparison to the study by Dollard (2012), PSC was assessed at the start of (T1), and halfway through the intervention project (T2). As such, the design rules out possible reciprocal effects of the intervention project influencing PSC and enables the exploration of changes in PSC over time. Furthermore, PSC was measured based upon the PSC-12, a well validated questionnaire (Loh et al., 2020). The following hypotheses will be tested:

> *Hypothesis 1*. PSC at T1 is positively related to information provision and employee involvement as experienced by the employees, and more positive appraisals of the (planned) actions at T2.

> *Hypothesis 2*. PSC at T1 is positively related to the number of actions taken between T1 and T2 and the fit of these actions to the psychosocial risks identified at T1.

In addition to the influence of PSC at baseline we will examine whether changes in PSC between T1 and T2 relate to the number and fit of actions taken in the project. However, at T2 EDs were strongly advised to improve the process by which interventions were implemented including information provision regarding and employee participation in the project, and pay special attention to how the project was perceived by employees. As such, we could not assess the effect of a change in PSC on information provision, employee involvement and positive appraisals between T2 and T3.

> *Hypothesis 3*. An increase in PSC between T1 and T2 is positively related to the number of actions taken between T2 and T3 and the fit of these actions to the psychosocial risks identified at T1.

If PSC proves to be an important contextual factor for a successful intervention project by activating mechanisms, this will have implications for the way psychosocial risk factors can be successfully reduced and well-being promoted. Confirmation of our hypotheses suggests that organizations with low to suboptimal levels of PSC should focus on enhancing PSC before starting (or at the start of) an intervention implementation project to reduce psychosocial risks at work.

Methods

The study design

The current study is part of a larger study on a 2.5-year (2017-2019) intervention implementation project among multiple EDs in the Netherlands, and concerns a field study without control group. Within this project EDs were free to decide upon the number and type of actions to reduce psychosocial risks at work and how these were implemented. They were supported by a thorough risk assessment at the start of the project (T1), regular feedback regarding their progress (based upon employee surveys at T2 and T3) and nine inspiration sessions to exchange best practices and gain knowledge on stress management from experts in the field. A project leader (often the ED manager) was appointed in each ED to increase response rates on the surveys and to serve as point of contact for the researchers. The project leaders also kept track of the actions taken in their ED to reduce psychosocial risks and/or increase well-being. These actions were listed on a standard form including a short description of the action, the start date of the action, the end date of the action (if relevant) and the goal of the action. These forms were collected every three to four months by the first author, followed by a short telephone interview to ensure the list was complete, and to ask for details and additional information regarding the actions taken. The study was approved by the ethical committee review board of the university.

Setting and sample

From the 19 hospitals participating in the project, EDs of 15 hospitals took part in the T1 and T2 measurements and were included in the current study. The number of nurses per ED varied between 18 and 101 with an average of 52 (SD = 20.7). All registered ED nurses and ED nurses in training enlisted during the time of the study received an invitation via their work e-mail address to participate in the surveys. Response rates on the questionnaires varied from 72% (N= 561) at T1 to 60% (N = 498) at T2. More than half of the nurses from T1 (61%) completed both surveys and were included in the analyses.

Materials

Risk assessment

Based upon recommendations (Nielsen & Randall, 2013) a thorough risk assessment was conducted at the start of the project. The risk assessment consisted of multiple (occupational specific) questionnaires administered to the ED nurses and ED nurses in training assessing job demands (e.g. aggression, emotional demands, work-time demands), job resources (e.g. social support, autonomy) and well-being indicators (e.g. burnout, work engagement, sleep problems). Psychosocial risk factors were identified in two ways. First, the average baseline scores of all EDs together were compared to available data of a similar study among emergency nurses of 15 EDs in Belgium (Adriaenssens et al., 2015) and data of nurses working in a large hospital in the Netherlands (Gelsema et al., 2005) using independent *t*-tests. Scores on job demands, job resources and well-being that were significantly ($p < .05$) more unfavorable were considered psychosocial risk factors for all EDs. Second, the scores of each ED were compared to the overall mean of all EDs in the intervention project. Significant unfavorable deviations from the grand mean were considered ED specific psychosocial risk factors. The results of the risk assessment (including the identified psychosocial risks) were fed back to the EDs in the form of an advice report.

Psychosocial Safety Climate

Psychosocial Safety Climate was measured at T1 and T2 using a survey incorporating the PSC-12 scale, a validated scale developed by Hall et al. (2010). The PSC-12 includes four subscales: 1) the priority of and 2) the commitment to psychosocial safety climate by management, 3) communication about, and 4) participation of all parties within the organization (e.g. employees, human resources) in providing a positive psychosocial safety climate. In line with Bronkhorst and Vermeeren (2016) we added a fifth factor measuring the group norm concerning psychosocial safety climate. This five-factor version has been confirmed by exploratory and confirmatory factor analyses (Bronkhorst, 2015; Bronkhorst & Vermeeren, 2016). Furthermore, in line with Bronkhorst and Vermeeren (2016), we differentiated between management layers by changing the questions concerning management priority to "top level" management priority and the questions concerning management commitment to "direct" management commitment. Each subscale included three items which were answered on a five-point Likert scale from totally disagree (1) to totally agree (5). All subscales have good internal

consistency (α = .79-.89). The overall Cronbach's Alpha was .93, which is comparable to other studies using this scale (Bronkhorst, 2015; Bronkhorst & Vermeeren, 2016).

Intervention activity

Activity in the intervention project was assessed as a count of actions taken between T1 and T3 as reported by the project leaders. The reported start dates and (if relevant) end dates on the form were used to determine which actions could be considered (i.e. were implemented during the time frame of the study). Information from the telephone interviews with the project leaders was used to assess whether these listed actions had indeed been implemented. Next, only actions that fitted the definition "… any activity, or program, or opportunity initiated by an organization, which focuses on reducing the presence of work-related stressors or on assisting individuals to minimize the negative outcomes of exposure to these stressors" (Ivancevich et al., 1990, p. 252) were included. Goals (e.g. "we aim to improve well-being") or outcomes of actions taken rather than the activity itself (e.g. "employees seem happier") were omitted. Furthermore, to avoid double counting, preparations (e.g. further research regarding psychosocial risk factors or setting up a workgroup) rather than the actions arising from these preparations, were excluded. Some examples of the final list of actions include: dividing the department in a high care and a low care unit to optimize patient flow, implementing security measures (e.g. appointing security, doors that can only be opened by staff, introduction of a no tolerance policy), the deployment of volunteers, hiring extra trainees and supporting staff, increasing opportunities for career development (e.g. rotation with the intensive care or ambulance, opportunity to become a physician assistant), introduction of self-rostering, training to improve communication within the team, psychoeducation on burnout, and sessions with a licensed professional (e.g. coach, psychologist).

An adjusted activity index was assessed to account for the possibility that the number of actions taken might depend on the number of psychosocial risk factors identified in the ED at T1 (see risk assessment). This index was calculated by dividing the number of actions by the number of psychosocial risk factors. A score of less than 100% indicates that less actions were taken than the number of risk factors identified. A score above 100% indicates that more actions were taken in the ED than the number of risk factors.

Intervention fit

Fit of actions reflects the extent to which the actions taken during the intervention project fitted general and ED-specific psychosocial risk factors identified at T1 (see risk assessment). In line with recommendations of Nielsen and Randall (2013) we aimed to assess the fit by comparing the list of actions to the goals stated for these actions. However, on most forms a distal goal (to improve employee well-being) or no goal was reported and as such this provided little information regarding the fit of the action taken. It was therefore decided to calculate an indication of fit by checking the list of actions for each psychosocial risk factor and determine whether the ED had taken any actions that addressed this risk factor; i.e. could be considered a fitting action. The assessment of fit was further optimized based upon the information given by the project leaders during the telephone interviews. In case it remained unclear whether a psychosocial risk factor was addressed during the intervention project by the ED, this was discussed with the second author of this paper until consensus was found. The total fit of actions was calculated by dividing the number of risk factors for which actions were implemented, by the total number of identified risk factors. Therefore, the fit has a potential range from no action taken for any of the risk factors (0%) to actions taken for all risk factors (100%).

Implementation process and positive appraisals

Information provision about the (progress of) the intervention project, employee involvement in designing and implementing actions and positive appraisals regarding the actions taken were measured in the employee survey at T2. All statements were based on the process evaluation checklist (Nielsen & Randall, 2013) and the intervention process measure (IPM) (Randall et al., 2009). First a description was given including some examples of possible actions that might have been taken in the past year. Next, information provision was measured with one item: "I am informed on the progress of such actions/interventions", employee involvement was measured with three items: 1. "I am involved in developing / implementing such actions", 2. "As an employee, I feel (partly) responsible for the implementation of such actions", and 3. "I have the opportunity to comment on such actions before they are implemented", and positive appraisals was measured with three items: 1. I trust that I can use the (scheduled) actions/interventions to reduce my psychosocial demands, 2. I expect that the (scheduled) actions/intervention will reduce my psychosocial demands, 3. I look forward to the change that (scheduled) interventions will bring. All statements were answered on a seven-point

Likert scale from `not at all` (1) to `to a very high degree` (7). The employee involvement scale and the positive appraisals scale had good internal consistency (α = .82, α = .82).

Statistical analysis

To account for the different levels on which variables were measured (i.e. employee level versus department level) and the nested structure of the data, a series of multilevel analyses were conducted. First, we assessed whether PSC at T1 was predictive of information provision, employee involvement and positive appraisals at T2 (hypothesis 1). PSC scores were aggregated to the department level. The Rwg(j) of PSC varied from 0.67 to 0.80 depending on the ED, with an average of 0.74, indicating moderate to strong agreement between employees PSC in each department (James et al., 1984). A one-way ANOVA showed that there was significant between-group variance ($F (15, 579) = 5.17$, $p < .01$), with 10% of the variance in PSC due to the ED level effect (ICC (1)). This can be considered a medium effect (Murphy & Myors, 1998, p. 47). The reliability of the group mean (ICC(2)) was .82, which is above the commonly used threshold of .70 (Nunnally, 1978, p. 245) and can be interpreted as "excellent" (Fleiss, 1986). Together, these results justified the aggregation of PSC to the ED level.

Multilevel linear modelling (MLM) was used to conduct three separate multilevel analyses with PSC at T1 as the independent variable and information provision, employee involvement and positive appraisals at T2 as the dependent variables. The analyses were performed in IBM SPSS statistics version 25 (IBM, 2017).

Next, we assessed whether PSC at T1 was predictive of (adjusted) activity and fit of actions taken between T1 and T2 (hypothesis 2). Since the outcomes (activity and fit) were measured at the department level and PSC on the employee level, micro-macro analyses were performed (Croon & van Veldhoven, 2007). Employees scores on PSC were aggregated to the department level by using the best linear unbiased predictors (BLUPs) of the group means (Croon & van Veldhoven, 2007). The analyses were repeated to assess whether the change score of PSC between T1 and T2 was predictive for activity and fit of actions taken between T2 and T3 (hypothesis 3). The R package for micro-macro multilevel modelling (Lu et al., 2017) was used to calculate the BLUPs and perform the analyses. For all analyses, a p-value of .05 was used to indicate statistical significance.

Results

See Table 1 for an overview of the variables under study. Over the whole project (T1-T3) EDs implemented a total of 230 actions, with 129 actions between T1 and T2 (with an average of 8.6 actions per ED) and 101 actions between T2 and T3 (with an average of 6.7 actions per ED). The number of actions adjusted for the number of psychosocial risk factors at T1 (the adjusted activity index) varied between 29 and 160 percent between T1 and T2, and from 11 to 225 percent between T2 and T3. Finally, the fit of actions per ED varied between 0 and 89 percent (with an average of 53 percent) between T1 and T2 and from 0 to 75 percent (with an average of 40 percent) between T2 and T3. EDs had an average PSC score of 2.83 (SD = 0.23) at T1 and of 2.89 (SD = 0.29) at T2. Using the questions related to the original four-dimension version of the PSC scale (Hall et al., 2010) and the cut-offs reported by Bailey et al. (2015), PSC sum scores ranged from 26.2 to 37.3 at T1 and from 29.4 to 39.2 at T2, which are indicative of an unfavorable PSC (<41) in all EDs at both time points. Between T1 and T2, PSC decreased in three EDs, remained stable in two EDs, and increased in the rest of the EDs.

PSC as predictor for information provision, employee involvement, and positive appraisals

To test hypothesis 1, regarding PSC as predictor for information provision, employee involvement and positive appraisals, a null model was created for each of the outcome variables with ED as random intercept (see Table 2). Next, PSC at T1 was added to the model. The improvement of the model including PSC, over the null model was assessed by testing the difference of the log likelihood by a chi-square test. Overall, PSC at T1 was significantly related to employee involvement and information provision at T2 but not to positive appraisals.

PSC as predictor for intervention activity and fit

With respect to hypothesis 2, three models were tested with PSC as predictor and activity, the adjusted activity index and the fit of actions to the psychosocial risks at T1 as outcomes variables (see Table 3). The results show that PSC at T1 did not significantly predict activity, the adjusted activity index, or the fit of actions taken between T1 and T2.

With respect to hypothesis 3, three models were tested with PSC at T1 and the change score of PSC between T1 and T2 as predictors and activity, the adjusted activity index and the fit of actions between T2 and T3 as outcome variables (see Table 4). The results show that the change in PSC scores between T1 and T2 adjusted for baseline PSC did not significantly predict activity, the adjusted activity index or the fit of actions taken between T2 and T3. However, a negative trend was found indicating that the more PSC improved, the less actions were implemented between T2 and T3 (b=-30.1, p =.072).

Table 1. Descriptives for psychosocial risk factors, Psychosocial Safety Climate (PSC), intervention activity and fit, the implementation process and positive appraisals.

Variables	Scale	*M*	*SD*	*Min-max*
Nr. Psychosocial risk factors per ED at T1	0 -19	8.8	1.45	7-11
PSC at the department level				
PSC T1	1-5	2.83	.23	2.36 - 3.33
PSC T2	1-5	2.89	.29	2.41 - 3.36
Intervention activities				
Intervention activity (count) T1-T2	0 ->	8.6	3.81	2 - 16
Intervention activity adjusted (%) T1-T2 [a]	0 ->	99	40.1	29 - 160
Intervention fit (%) T1-T2	0 - 100	53	22.0	0 - 89
Intervention activity (count) T2-T3	0 ->	6.7	5.0	1 - 18
Intervention activity adjusted (%) T2-T3 [a]	0 ->	79	62.0	11 - 225
Intervention fit (%) T2-T3	0 - 100	40	23.0	0 - 75
Implementation process				
Information provision T2	1-7	3.70	1.49	1-7
Employee involvement T2	1-7	3.69	1.34	1-7
Positive appraisals				
Positive appraisals T2	1-7	3.64	1.23	1-7

*Note. N(*departments) = 15, *N(*employees) = 343, ED= Emergency Department, PSC= psychosocial safety climate, [a] score of <100 indicates no actions implemented for one or more risk factors, T1=January/February 2017, T2=June/July 2018

Table 2. Multilevel analyses with Psychosocial Safety Climate (PSC) at T1 as predictor of employee involvement, information provision, and positive appraisals between T1 and T2

		Information provision T1-T2		Employee involvement T1-T2		Positive appraisals T1-T2	
Model	Independent variable	*b*	*p-value*	*b*	*p-value*	*b*	*p-value*
Null model	Intercept	3.747	.000	3.713	.000	3.674	.000
	-2 Log likelihood	1227.98		1168.64		1106.39	
Model 1	Intercept	-0.056	.969	.731	.468	2.924	.031
	PSC at T1	1.345	.017	1.049	.010	0.265	.550
	-2 Log Likelihood	1222.14		1161.48		1106.03	
	ΔChi-square M0 and M1	5.84	<.01	7.14	<.01	0.36	*n.s.*
	ΔDf	1		1		1	

*Note. N(*departments) = 15, *N(*employees) = 343, ΔChi-square = chi-square change with the null model, PSC = Psychosocial Safety Climate aggregated to the hospital level. n.s. = not significant at $p < .05$

Table 3. Results of micro-macro level analyses with PSC at T1 a as predictor for intervention activity and intervention fit between T1 and T2.

Independent variable	Intervention Activity T1-T2			Adjusted Activity Index T1-T2			Intervention Fit T1-T2		
	b	*p-value*	*β*	*b*	*p-value*	*β*	*b*	*p-value*	*β*
Intercept	0.77	.959		-0.21	.889		-0.02	.977	
PSC T1	2.78	.599	.10	0.42	.427	.19	0.92	.373	.76

*Note. N(*departments) = 15, *N(*employees) = 343. Adjusted Activity Index = intervention activity adjusted for the number of psychosocial risk factors at T1.

Table 4. Results of micro-macro level analyses with the change score of PSC between T1 and T2 corrected for PSC at T1 as predictor for intervention activity and intervention fit between T2 and T3.

Model	Independent variable	Intervention Activity T2-T3			Adjusted Activity Index T2-T3			Intervention Fit T2-T3		
		b	*p-value*	*β*	*b*	*p-value*	*β*	*b*	*p-value*	*β*
1	Intercept	0.15	.993		0.09	.963		0.45	<.001	
	PSC T1	2.34	.695	.09	0.25	.704	.07	-0.87	.344	-.70
2	Intercept	4.53	.713		0.56	.699		-0.06	.938	
	PSC T1	1.43	.743	.05	0.15	.763	.04	0.18	.516	.14
	Δ PSC T1-T2	-30.10	.072	-.40	-3.28	.162	-.35	-0.82	.384	-.24

*N(*organizations) = 15, *N(*employees) = 343. Adjusted Activity Index = intervention activity adjusted for the number of psychosocial risk factors at T2.

Discussion

In the current study, we assessed the role of Psychosocial Safety Climate (PSC) in a 2.5-year intervention implementation project involving multiple emergency departments (EDs) in the Netherlands. According to our knowledge, with the exception of the pilot study from Dollard (2012), this is the first study to assess PSC as prerequisite for successful intervention implementation. The results show that a more favorable PSC was related to better information provision and more employee involvement in the intervention project. However, PSC did not predict more positive appraisals from employees towards the actions taken. In addition, PSC nor a change in PSC predicted the number or fit of the actions implemented in the following year. The findings will be discussed in more detail below.

First of all, our finding that a more a favorable PSC predicted better information provision and more employee involvement during the project, is in line with the Context-Mechanism-Outcome (CMO) framework of the realist approach proposing that certain mechanisms are only activated under certain circumstances. In addition, this finding supports the notion of PSC as "cause of causes" (Dollard & McTernan, 2011). In organizations where psychosocial safety is often discussed between management and employees, it is more likely that employees will be informed about the goals and process of an intervention project to reduce psychosocial risks at work. Similar, in organizations where all parties are involved in issues regarding psychosocial safety, it is more likely that employees will be provided the time and resources needed to participate in a stress management intervention (SMI) project.

Against our expectations, neither a more favorable PSC at baseline nor an increase in PSC was significantly related to the number or fit of actions implemented during the project. These findings are in contrast to the pilot study by Dollard (2012) in which a more favorable PSC related to greater intervention progress (i.e. the extent to which action plans were executed). One explanation for this difference is that the study of Dollard was performed in two governmental organizations, which most likely includes a stable setting with a reasonable number of resources (time and financial resources) to implement actions. In contrast, the ED concerns a setting pressurized by budget cuts, reorganizations and mergers, high workload and high turnover of staff. To illustrate: during the SMI project three out of the fifteen hospitals closed one or more ED locations, in about half of the hospitals a change in project and/or ED management occurred, and one third of the nurses had left the ED by the end of the study.

Independent of the level of PSC, these changes can take attention away from the intervention project (Nielsen & Noblet, 2018), and may lead to discontinuity and delays in implementing actions (Andersen & Westgaard, 2013; Geerligs et al., 2018). Furthermore, limited resources (e.g. financial and staffing) might have forced EDs to focus on the most prominent risk factors: the reduction of work-time demands and solving staffing issues, which in turn may explain the absence of a relationship between PSC and action fit. Overall, this suggest that although PSC may predict how actions were implemented (i.e. information provision and employee involvement), other contextual factors (i.e. financial resources, staffing levels and a stable working environment) might play a larger role in the number and fit of actions taken. Still, it must be mentioned that the low levels of PSC found in the EDs could have also led to an underestimation regarding the impact of PSC on intervention activity and fit in the current study.

In addition, it must be noted that a negative trend was found indicating that the more PSC increased in the ED, the less actions were implemented. A logical explanation would be that EDs with an increase in PSC started to change their approach from taking many smaller actions to a few larger ones in an attempt to reduce psychosocial risks at work. However, an inspection of the list of actions rather suggested that the trend was the result of a "catch up" of ED's that had deteriorated in the first period of the project (reduced PSC, more unfavorable working conditions and an increase in stress-related outcomes) at T2, and started taking many actions during the second half of the project.

Finally, PSC at baseline was not predictive of employees` positive appraisals regarding the actions taken. It is possible that even in organizations with stronger prioritization of employee health, positive appraisals of the project were reduced due to the limited ability of EDs to resolve the most important issues. For example, many prominent problems the emergency departments faced (e.g. overcrowding, staffing problems) were partly beyond the control of the EDs. Solving these problems required the collaboration with parties inside (other departments) and outside (e.g. ambulance, general practitioners, government) the hospital, thus involving a complex and lengthy process. In addition, previous unsuccessful efforts of management to instigate change, may have led to pessimism about successful implementation of future changes in the ED (Bordia et al., 2011; NytrØ et al., 2000). Finally, the prevalence of stress-related outcomes in the current study population was high, with one out of three nurses

reporting burnout complaints and one out of five symptoms of post-traumatic stress (de Wijn & van der Doef, 2021). This indicates that employees had limited mental resources available to deal with any changes due to a SMI project, which may in turn affected positive appraisals of the (planned) actions, even in EDs with more favorable PSC. For example, in a study by Kirrane et al. (2016), the positive relationship between management support for a program to instigate change in an organization and employees' positive appraisals towards the program was partly mediated by employees' psychological resources. Overall, this suggests that environmental as well as psychological resources are necessary for employees to welcome and embrace change and have positive appraisals of a SMI project (Kirrane et al., 2016).

Theoretical implications

Interventions to reduce psychosocial risks and increase employee well-being are complex interventions, and as recommended by Nielsen and Miraglia (2016) best understood using a realist approach testing CMO propositions. Although a considerable body or research exists regarding mechanisms that are related to greater intervention effectiveness, insight into the necessary context to trigger these mechanisms is limited. The current study adds to the literature by assessing the effect of a contextual variable, Psychosocial Safety Climate, on mechanisms (the number and fit of actions taken, information provision, employee involvement and positive appraisals) in a large-scale intervention project. The findings are in line with the proposition of the realist approach stating that mechanisms can be activated or hindered depending on the context (Hewitt et al., 2012). In addition, the relationship between PSC and the implementation process in the current study suggests that PSC is an important contextual variable to consider when testing CMO configurations in SMI research. Finally, the results have important implications regarding the theory of PSC as "cause of causes", as they suggest an alternative route by which PSC predicts working conditions partly through the way (i.e. information provision and employee involvement) these organizations tackle psychosocial risk factors at work.

Practical implications

In line with Dollard (2012), the current study suggests that PSC should be measured, considered, and if unfavorable improved before or at the start of an intervention project to reduce risk factors and enhance employee well-being. In addition, PSC in the current study was not stable across time and in some EDs even decreased during the project. As such, it is

recommended to assess PSC with regular intervals to ensure the context does not obstruct the activation of important mechanisms (e.g. employee involvement) related to greater intervention success. Regarding ways to stimulate PSC in an organization, there are a limited number of successful studies available which are listed in the review by Loh et al. (2020). Examples include the introduction of a customized occupational safety website for police officers (Rasdi et al., 2018), and an intervention including transformational leadership training and meetings between employees and (senior) management to talk about health and safety related issues (Bronkhorst et al., 2018).

Directions for future research

Although the current study provides support for PSC as an important contextual variable in SMI projects, more research is warranted. First of all, all EDs had low PSC scores at baseline indicative of an unfavorable context, which might have led to an underestimation of its relationship with mechanisms in the current project. In addition, limited resources to implement interventions and the continuous occurrence of ad hoc problems in this setting might have overshadowed the influence of PSC on activity and fit of actions taken during the intervention project. It is therefore recommended to replicate the current study in a context where there is more variation in PSC between organizations, and a more favorable situation regarding resources (e.g. financial, staffing). Finally, although the impact of process variables has received increased attention in SMI projects, more research on contextual factors is necessary to understand the circumstances under which these mechanisms are triggered. Future intervention research might profit from studying other contextual factors alongside PSC including mental and organizational resources at the start of an intervention project and changes during the intervention project (e.g. reorganizations and change in management).

Strengths

The current study has some important strengths. First of all, in comparison to the pilot study of Dollard (2012), the longitudinal design including multiple measurements made it possible to study the effects of baseline PSC as well as effects of changes in PSC. Second, there was a realistic time frame between measurements for the EDs to develop and implement actions, which enabled the possibility to study the effect of PSC on the number and fit of actions. Third, multilevel analyses were used taking individual variation within the EDs into account as opposed to simple aggregation. Finally, the telephone interviews led to continuous contact

with the project managers and gave insight in the barriers they experienced during the intervention project. Although it was not meant to inventory these barriers, insight in the contextual factors helped to interpret the results of the study.

Limitations

The current study is also subject to some limitations. First of all, the assessment of the number of actions taken and the fit of these actions to identified risk factors were dependent on the reporting by the project managers. The rather unrestrictive format for reporting the actions taken have led some managers reporting multiple actions as one, whether others reported one action in multiple parts. Although the reliability of the list was improved by conducting follow-up telephone interviews, future studies might benefit from a more structured approach with more directive questions concerning actions taken during the intervention project. In addition, we are aware that the number does not equal the quality of the actions, and as such is likely to be a limited predictor of intervention success. For example, no difference was made between many smaller actions (e.g. increasing the financial reward to fill open shifts; psychoeducation on burnout symptoms) and a few larger actions (e.g. dividing the department in low care and high care to optimize patient flows). Still, as it proved to be difficult for EDs to take any action at all, independent whether it could be considered small or large, we believe that the number of actions still gives a good indication of activity in the intervention project. In line with this, we are aware that the fit of actions implemented is only a crude indicator of the fit to psychosocial risk factors. Although reliability of the fit was maximized using information from the telephone interviews with project leaders, future studies could improve this measure by conducting surveys and interviews amongst employees to collect their views regarding the appropriateness of the implemented actions (Nielsen & Randall, 2013).

Finally, the number of departments included in the current study may have limited the power to find statistically significant results. The minimum recommended sample size and number of groups for multilevel analysis has been a topic of debate (Scherbaum & Ferreter, 2008) and recommendations fluctuate from 30 groups with 30 individuals (Kreft, 1996) to 100 groups with at least ten individuals (Hox, 2002). Simulation studies show that for group level relationships, mainly the number of groups is important for acceptable power. Although other studies including a small number of groups have found significant results (e.g. 18 schools in

Dollard and Bakker (2010), 18 teams in Zadow et al. (2017), future studies testing CMO configurations should aim to include a larger number of organizations.

Conclusion

In the current study it was examined whether a favorable context in terms of Psychosocial Safety Climate triggers mechanisms (e.g. number of actions taken, fit of action taken, employee involvement, information provision and positive appraisals) in a 2.5-year intervention project aimed at reducing psychosocial risk factors and improving employee well-being among multiple emergency departments. Overall, the findings suggest that PSC is an important predictor of better information provision and more employee involvement during the intervention project. No evidence was found for a relationship between PSC and the number of actions taken, the fit of these actions to current psychosocial risk factors, and employees' positive appraisals. It is possible that these factors are more strongly determined by available organizational and personal resources. This study adds to the growing literature on PSC and supports the notion of PSC as important contextual starting point for successful intervention implementation. Furthermore, the results emphasize the importance of studying the impact of contextual factors in intervention projects, to enhance our understanding on how to effectively reduce psychosocial risks and enhance well-being in the working population.

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