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Developing Stress-preventive Management Competencies: An Evaluation of the Mechanism and the Process in a Training Experience

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Developing Stress-preventive competencies

Abstract

Purpose: Developing stress-preventive management behaviors is recommended to improve psychosocial working conditions and employee well-being. A learning and development intervention based on the UK "Management Competencies for Preventing and Reducing Stress at Work (MCPARS)" is effective for helping supervisors to develop a personal action plan for change. However, research is needed to understand the mechanism through which a satisfactory action plan is developed.

Design/methodology/approach: A three-phase learning and development program based on the MCPARS framework was delivered to 50 supervisors in an Italian local health unit. We measured management competencies and development needs, the achievement of the intervention aims, and two process variables. The Process Macro for SPSS was used to evaluate a moderated mediation model.

Findings: Supervisors' self-awareness of their competencies fully mediated the relationship between understanding the importance of their managerial role and the development of a satisfactory action plan for change. Process variables contributed to better explaining the outcome.

Originality: These findings suggest that the order in which the intervention components are delivered and participants' perceptions of the intervention are important. This knowledge is useful to inform the design and evaluation of future similar interventions.

Keywords: Management Competencies for Preventing and Reducing Stress at Work; Intervention design; Process variables; Supervisors' development; Work stress management

1. Introduction

Work-related stress is a significant occupational safety and health concern (ILO, 2016; WHO, 2022), resulting in direct costs (e.g., healthcare expenses) and indirect costs (e.g., absenteeism and decreased productivity). Given the complexity of the phenomenon, programs aimed at reducing work-related stress and improving well-being require multi-stakeholder involvement (e.g., Hasson et al., 2014), multilevel interventions (e.g., Nielsen et al., 2018), structured and participatory approaches (e.g., Nielsen et al., 2010), and strategic and dynamic perspectives (e.g., Watson et al., 2024). Senior management support is vital (Aust & Ducki, 2004) for asserting direction (Mellor & Webster, 2013), allocating necessary resources (e.g., Nielsen & Abilgard, 2013), and shaping the attitudes of line managers and employees (Hasson et al., 2014). Supervisors are both a key stakeholder and possible target of intervention. They are drivers of change and determine the implementation of successful organizational interventions (Ipsen et al., 2018). By interacting regularly with employees they can impact employee stress and well-being (Yarker et al., 2007, Skakon *et al*., 2010, Toderi *et al*., 2015). Preventative interventions aimed at developing leadership and manager behaviors are considered effective (Kelloway and Barling, 2010; Rudolph et al., 2020) and recommended (Eurofound and EU-OSHA, 2014; WHO, 2022).

Approaches to stress prevention and reduction focused on supervisors have mainly used or adapted classic models of leadership, such as transformational and transactional leadership styles (e.g., von Thiele Schwarz et al., 2016; Jacobsen et al., 2021). Several authors have suggested that traditional performance-oriented approaches may fail to fully elucidate specific behaviors relevant to employee health and well-being (Yarker *et al*., 2007, 2008; Franke et al., 2014), resulting in the development of more focused approaches. Some of these centre on the leaders' influence on employee health (e.g., Franke et al., 2014) and share an explicit assumption that leaders' values, attitudes, and behaviors support follower health and well-being and can be improved (see Rudolph et al., 2020 for a review).

Other approaches focus on supervisors' skills and behaviors (i.e., management competencies) related to the creation of a healthy work environment. By interacting directly and regularly with employees, supervisors can influence job design and work characteristics (e.g., psychosocial factors, such as demands and control), and it is important that they monitor and, if necessary, modify their own behaviors

to support this (Gilbreath, 2004). Thus, management competencies can contribute to creating healthier workplaces and, consequently, well-being (Gibrealth & Benson, 2004). Focusing directly on the source of impaired health (i.e., psychosocial factors), this approach is preventive and more easily linked to the work-related stress prevention programs, which are mandatory in the European Union and elsewhere. To the best of our knowledge, three frameworks of stress-preventive management competencies are available: those of Gilbreath (Gilbreath, 2004; Gilbreath & Benson, 2004), Yarker and colleagues (2007, 2008), and St-Hilaire et al. (2018). The approach of Yarker and colleagues is arguably the most advanced, involving a validated questionnaire for the measurement of management competencies (Yarker et al., 2008; Toderi & Sarchielli, 2016) and a practical intervention strategy noted by EU-OSHA and Eurofound (Eurofound and EU-OSHA, 2014) as excellent practice for the development of positive supervisor behaviors. Donaldson-Feilder et al. (2009) provided extensive, mainly qualitative, support for the benefits of the development of supervisors' management competencies. Nevertheless, further research to understand the mechanisms of change and the practical application of the intervention is warranted (Yarker et al., 2022).

In the following paragraphs, we first present a brief summary of the available knowledge on the MCPARS framework and highlight the need for further knowledge with respect to practical application. Next, we present the aim of the study and the research hypotheses. In brief, we aim to contribute by reporting the results of an intervention conducted in a public administration located in Italy. We focus on (i) the mechanism through which the intervention influences the proximal outcome (i.e., the development of an action plan) and (ii) process variables (i.e., activities and project mental models) that contribute to explaining the outcome. We provide useful empirical evidence on the mechanism that links the three intervention aims and may inform the design and evaluation of future similar interventions.

2. Theoretical Background

2.1 Management Competencies for preventing and reducing stress at work framework

The *Management Competencies for Preventing and Reducing Stress at Work* (MCPARS) framework is designed to be easily integrated within development interventions. Yarker *et al*. (2007; 2008) provided

three main contributions to the development of management competencies (MCs) for preventing and reducing stress at work: a) a theoretical framework of four MCs (*Being respectful and responsible*, *Managing and communicating existing and future work*, *Reasoning and managing difficult situations*, *Managing the individual within the team*); b) a 66-item questionnaire (Stress Management Competency Indicator Tool – SMCIT) available in two versions (manager self-report and employee upward feedback); and c) two intervention modalities (Donaldson-Feilder *et al*., 2008), a "self-reflection exercise" that is freely available[1] to help managers identify development needs and an intervention protocol that includes the completion of upward feedback tool and the preparation of a self-defined action plan during a structured workshop.

The first two contributions have received empirical support, while the third is largely neglected. Considering the theoretical framework, Adachi *et al.* (2020) in Japan and Houdmont *et al*. (2020) in the UK found that all four management competencies were relevant in their samples (i.e., each MC was in need of development for at least a part of the sample). Houdmont *et al.* (2020) also found that when employees reported their line manager had a development need, this was associated with employees' self-reported elevated odds of psychological distress, low resilience, and low work engagement. Additionally, Toderi and Sarchielli (2016) found the four management competencies to be linked to the six psychosocial factors delineated in the Management Standards approach (Cousin *et al.*, 2004; MacKay *et al.*, 2004), with associations mainly as predicted by a group of 38 psychosocial work environment experts in the research of Yarker *et al.* (2008). Psychosocial factors were also found to mediate the relationship between supervisors' management competencies and employees' well-being in an Italian investigation (Toderi and Balducci, 2018). Finally, two recent studies showed that the degree of manager-team (dis)agreement on the MCPARS's competencies is associated with different levels of mental health and job performance reported by employees (Toderi et al., 2024; Salvoni et al., 2024). Overall, the available literature highlights the importance of the four competencies and their association with psychosocial factors and well-being.

[1] https://www.hse.gov.uk/stress/mcit.htm

Evidence exists in relation to the second contribution, specifically the validity of the SMCIT. Toderi and colleagues (Toderi *et al*. 2015; Toderi and Sarchielli 2016) found support for the factorial structure and criterion validity, and provided evidence that the two versions of the 36-item SMCIT (supervisors and employees) have the same underlying structure (Toderi and Balducci, 2018).

The third contribution of Yarker and colleagues was intended to facilitate the practical application of the framework (Donaldson-Feilder *et al.,* 2009). The authors defined an intervention protocol[2] aimed at developing MCs, which was implemented and evaluated with 112 managers in 16 UK organizations. Essentially, following assessment of the four MCs by supervisors and employees, an upward feedback report is created, and an interactive workshop for groups of up to 12 managers scheduled. The workshop aims to (Donaldson-Feilder *et al.,* 2009): (1) explore the importance of positive manager behavior, increase motivation for their development; (2) increase awareness of managers' own behaviors and development needs, which represents an essential mechanism for change; and (3) equip managers with the tools to enhance and further develop their skills, creating a personal action plan for development. The proposed intervention (and aims) has its theoretical foundations in the literature about multi-source feedback and personal development. The first aim focuses on the desired behaviors (e.g., performance standards set by the organization, London & Smither, 1995), increasing feedback salience and supervisors' engagement and motivation. In so doing, it is also a vehicle for introducing cultural change (i.e., recognition of the importance of good jobs and work stress prevention, and the supervisors' role) and creates an opportunity to reinforce organizational messages (Bracken and Rose, 2011), communicating to supervisors the competencies and behaviors that the organization values and rewards (McCarthy and Garavan, 2001). The second aim (i.e., increasing awareness of one's own competencies and development needs) is a common component in leadership interventions (Mosson *et al*., 2018) and important in identifying directions for development and improvement (London & Smither, 1995). Consequently, the third aim, the design of an action plan (McCarthy and Garavan, 2001) or goal setting (London and Smither, 1995), is needed for competency development and behavior change.

[2] An overview is available in Donaldson-Feilder et al. (2009) and at https://www.affinityhealthatwork.com/management-competencies

The evaluation of the intervention (see Donaldson-Feilder et al. 2009 for a complete description) provides an understanding of its effectiveness. The authors used a mixed-method approach, with quantitative and qualitative (open questions) data collected from supervisors before and after the workshop plus qualitative information collected from supervisors and senior managers to identify the main facilitators and barriers to the program. Results indicated good commitment to and perceptions of the workshop by participants, and three months later 75% of respondents declared that they had made changes to their behaviors. Several facilitator/barrier factors were identified, predominantly in the preparation phase (e.g., integrating the intervention into existing initiatives and policies) and the post-workshop period (e.g., organizational support for manager behavior change). The three (core) aims of the intervention were mainly explored qualitatively, limiting the understanding of the link between them. No further evidence about the proposed intervention is available in the literature, with the exception of Adachi *et al.* (2020). These authors used the self-reflection exercise (instead of upward feedback) in a workshop for managers with similar declared aims, demonstrating a partial development of management competencies after the workshop.

A key feature of the intervention is that it was designed for the achievement of three aims that the available literature suggests can be considered hierarchically linked. Though the findings of Donaldson-Feilder et al. (2009) show positive perceptions of the three aims, it remains unclear how these are linked and contribute to the final expected outcome of the workshop, i.e., an action plan that the supervisor considers satisfactory and implementable (third aim). This kind of knowledge could usefully inform the design of future similar interventions to sustain change.

2.2 Aim of the study and research hypothesis

We present the results of an intervention conducted in September-October 2019 with 50 line managers at an Italian local health unit. The intervention was designed in accordance with Donaldson-Feilder *et al's.* (2009) protocol, yet adapted to include self-reflection without upward feedback because of organizational context and resource constraints (see below).

We aim to contribute to the understanding of the intervention for the stress-preventive MCs proposed by Donaldson-Feilder et al. (2009) by investigating the mechanism by which it can support participants in the generation of a satisfactory action plan for their development (the outcome variable in this study). In so doing, we also consider two process variables identified as relevant to organizational interventions: participants' perceptions about the overall project and specific activities (Nielsen and Abildgaard, 2013).

The three main variables of the study, constitute the main aims of the intervention proposed by Donaldson Feilder et al. (2009), as outlined above: the importance of positive manager behaviors, self-awareness of management competencies, and the development of a satisfactory action plan. Informed by the literature on multi-source feedback and personal development presented above, we propose that the three aims of the intervention are hierarchically linked and explain how a satisfactory action plan for the development of MCs (the proximal outcome for the following change of competencies and employees' psychosocial work environment) can be achieved. More specifically, managers' understanding and recognition of the importance of their behaviors concerning employees' psychosocial work environment and well-being (aim 1) is needed to create motivation to increase awareness of managers' behaviors and development needs (aim 2). In turn, the acquisition of knowledge concerning development needs (i.e., self-awareness) will facilitate participation in the activities intended to equip managers with the tools to further develop their competencies, creating a personal action plan (aim 3).

Our first hypothesis is as follows:

H1: Managers' self-awareness of their management competencies (aim 2) will mediate the positive relationship between understanding of the importance of positive manager behaviors (aim 1) and the generation of a satisfactory action plan for competency development (aim 3).

Process evaluation has been advocated for examining the how and why of intervention outcomes (Cox *et al*., 2007, Nielsen and Randall, 2013). Several comprehensive process evaluation frameworks exist (e.g., Skivington et al., 2021) within the field of work and organizational psychology (e.g., Nielsen and Randall, 2013; de Lange et al., 2024) that are mainly intended for complex interventions. Schelvis et al. (2016) noted that despite the fundamental role of comprehensive (mixed method) evaluation, this

approach requires extensive data collection, is time-consuming, and process and effect data are often not combined. Thus, even if identifying mechanisms of change requires qualitative evidence, observing how mechanisms are linked to outcomes requires quantitative analyses (Nielsen & Miraglia, 2017). Accordingly, several studies on organizational interventions have developed and applied quantitative measures of previously identified process variables (e.g., Randall et al., 2009; Nielsen et al., 2023).

Nytrø *et al.* (2000, p. 214) defined process variables as "individual, collective or management perceptions and actions in implementing any intervention and their influence on the overall result of the intervention." A crucial aspect relevant in our study concerns participants' mental models of the intervention that influence intervention outcomes through their impact on the actors' behaviors (Nielsen and Abildgaard, 2013). Mental models can be divided into those related to the intervention program (i.e., perceptions about the overall project; e.g., knowledge of the intervention or beliefs concerning whether the intervention may be beneficial) and those related to intervention activities or content (i.e., perceptions of the quality of specific activities of the intervention; e.g., if activities are considered necessary or whether they are well understood).

In the present study, we considered both these perceptions because those concerning specific activities may impact participants' behaviors (Nielsen and Abildgaard, 2013). For example, Nielsen *et al*. (2007) found that perceptions of the quality of the activities fully mediate the relationship between participation in the intervention and work changes. We focused on activities that are particularly important for the intervention implemented, those related to the self-reflection exercise. The intervention was designed to maximize self-awareness using a self-reflection exercise and a diary completed over one week. These activities were complex and performed by participants alone (see below for a more detailed description of this phase), and their understanding is considered essential for the effectiveness of the self-reflection activities. Therefore, we propose the following moderation hypothesis:

H2: Understanding the self-reflection activities will enhance the positive relationship between understanding the importance of positive manager behaviors (aim 1) and self-awareness of managers' own management competencies (aim 2).

Combining the preceding hypotheses, we further test a moderated mediation that the indirect effect of the first aim on the third via the second is conditional to the understanding of the self-reflection activities (see **Figure 1**). Accordingly, we hypothesize that:

H3: The path leading from understanding the importance of positive manager behaviors (aim 1) to the development of a satisfactory action plan for development (aim 3) via self-awareness of managers' own management competencies (aim 2) is strengthened by a more positive understanding of the self-reflection activities.

Finally, perceptions about the overall project (intervention) may impact participants' behaviors and perceptions as well (Nielsen and Abildgaard, 2013). For example, Sørensen and Holman (2014), studied the effect of a participative intervention to improve employee well-being in knowledge work jobs, included tailored items to measure the intervention process (i.e., overall project knowledge and expectations), and found that they are important implementation factors. Thus, we consider overall project perceptions as a control variable to better evaluate the proposed model.

- INSERT ABOUT HERE FIGURE 1 -

As a secondary aim of the study, we focused on the MCPARS framework itself and the relevance for participants of the four MCs comprising the framework to explore if all can be considered of importance for at least some participants. The SMCIT questionnaire allows the generation of scores for every supervisor indicating their performance on the four MCs, with a score of ≤75% indicating a clear development need. The studies of Adachi *et al.* (2020) and Houdmont *et al.* (2020) showed that all four competencies were in need of development for at least a portion of the sample, lending further support to the relevance of the four-factor theoretical framework. We aim to provide further evidence of the validity of the MCPARS framework using more direct evidence about the importance of each competence. The intervention required each supervisor to identify the competence that s/he would be interested in developing (i.e., most in need of development). We aim to evaluate the frequency of the competencies selected to understand if the theoretical model is upheld and if all the MCs have practical value for participants in an intervention context.

3. Materials and methods

3.1 Intervention design and program logic

The intervention was designed to improve supervisors' competence in relation to supporting employee well-being. In collaboration with an organizational internal expert on work-related stress and well-being, the intervention protocol developed by Donaldson-Feilder *et al*. (2009) was adapted in recognition of two main organizational constraints, i.e., lack of previous experiences with psychosocial factors and a recent re-organization, which limited the potential involvement of employees in such a sensitive activity due to the unexpected negative consequences that sometimes follow organizational change (e.g., tensions, insecurities, distress, Cascio, 1993). Consequently, the half-day workshop suggested by Donaldson-Feilder *et al.* (2009) for the achievement of the three aims was adapted and implemented in the form of a three-stage activity (plus a preparation phase), with each phase focused on achieving one aim. This re-design aimed to 1) address the absence of organizational knowledge and experience concerning psychosocial factors, reinforcing the first part (aim 1) to better focus on desired leadership behaviors and create understanding and motivation about them; 2) deal with the impossibility of employees' involvement (and upward feedback), by using an in-depth self-reflection activity to acquire awareness on one's management competencies and development needs. The phases and preparation of the intervention are described below. See **Figure 2** for a schematic diagram of intervention design and implementation with timelines.

- INSERT ABOUT HERE FIGURE 2 -

Preparation phase

In this phase, the existing organizational situation, constraints, and objectives were considered, and the program logic (e.g., the three hierarchical aims) and activities (specific actions) were designed and explicated. A letter signed by the director was sent to supervisors, describing the main characteristics of the intervention (i.e., aim, utility, integration with the organizational objectives, support by senior

management, program logic, activity flow, and schedule) in order to secure their involvement and create a mental model of the overall intervention.

Phase 1: Exploring importance: Starting seminar (aim 1)

Supervisors participated in a three-hour seminar for the achievement of the first aim (i.e., to explore the importance of positive manager behaviors). After an introduction by the Director and a project champion that aimed to communicate the organizational message (aim of the project, utility, the integration with the organizational objectives, support by senior management), the psychosocial factors and their implications were presented, and the role of supervisors explicated. Then the MCPARS competencies were presented and proposed as a framework to understand the behaviors of interest. Last, the planned activities and their meaning and utility were explained to create an appropriate mental model about the specific activities. At the end of the seminar, the Time 1 (T1) questionnaire was completed evaluating seminar content (importance of positive manager behaviors), the overall project, and understanding of subsequent activities.

Phase 2: Self-reflection and monitoring of the management competencies (aim 2)

This phase aimed to achieve the second aim (i.e., increase awareness of managers' behaviors and development needs). The activities were designed to stimulate self-reflection by supervisors on their own management competencies and the identification of development needs (i.e., the management competency that one wants to develop). This was done in two steps. First, one week after the initial seminar supervisors completed the SMCIT self-reflection exercise (T2), calculated their scores, and selected one competency for development based on the scores obtained, the description of the competency, and its relevance to their work. Second, the supervisors kept a structured diary for the following working week. Referring to the chosen competency, they had to document any negative behaviors they engaged in and positive behaviors they omitted, as well as the associated circumstances and reasons. The purpose was to raise awareness of their specific behaviors and the underlying contextualized reasons and circumstances. An anonymized copy of the completed SMCIT self-reflection exercise and diary was delivered to the researchers.

Phase 3: Workshop and action plan development (aim 3)

This phase took place the following month and aimed to achieve the third aim (i.e., creating a personal action plan for development). Every supervisor participated in one of five organized three-hour small group workshops comprising 8 to 13 participants. For each management competency, a brief presentation was provided followed by a discussion about the importance of the competency in the specific work environment, the obstacles to displaying positive behaviors, and how these can be overcome. Participants shared experiences and learned from each other about contextual difficulties and best practices and took notes in a structured workbook concerning relevant information for their selected competency. At the end, they were instructed to define a personal action plan for development and enter this in the workbook. A second research questionnaire (Time 3) was completed measuring perceptions about self-awareness of management competencies and personal perceptions of the action plan (aim3).

Ethical consideration. A formal agreement was forged between the respective organizations, delineating the project's aims, procedures, and activities. Subsequently, an institutional communication from senior management was disseminated to all participants, elucidating the learning and development initiative pertaining to managerial competencies and emphasising that no identifiable personal data would be collected from participants. This communication encompassed the project's objectives, modality, activities, anonymous data collection and use for scientific purposes. Informed consent was obtained at the point of enrolment in the training project via the organization's intranet. No identifiable personal data were collected from participants. Although no formal ethical approval was required from the lead researcher's institution, all activities complied with Italian Privacy Law (D. Lgs. 196/2003), Health and Safety law (D. Lgs. 81/2008) and EU GDPR (Regulation 679/2016).

3.2 Measures

Two questionnaires were used at T1 (the end of the seminar, T1 Questionnaire) and T3 (the end of the workshop, T3 Questionnaire). These measured the achievement of the three aims and the two process variables used as moderator and control variables. The SMCIT was used at T2. Items were developed for this T1 and T3 Questionnaires in this study or adapted from Donaldson-Feilder *et al.* (2009), Nielsen *et al.* (2007), and Sørensen and Holman (2014). Despite possible concerns about the validity and

reliability of such measures (Boateng et al., 2018), tailored and context-specific measures considering contextual differences have been recommended (e.g., Randall et al., 2009), and are widely used (Abilgard et al., 2016). All items were measured on a 5-point Likert scale with the instruction: "Please answer the following questions on a scale of 1–5, where 1 is the least favourable response and 5 the most favourable response" (see Donaldson-Feilder *et al.,* 2009, p. 54). Participants produced a unique personal identifier that allowed for responses to be matched.

3.2.1 Importance of positive manager behaviors (aim 1)

Three items of T1 Questionnaire were used at T1. Two were derived from Donaldson-Feilder *et al.* (2009): (1) "To what extent has the seminar achieved its objective of exploring the importance of developing managerial competencies?" and (2) "To what extent will you be able to apply in your work what you have learned in this seminar?". A third item was created to capture the global experience of the seminar: (3) "In summary, how satisfied are you with the seminar on management competencies development?". The scale showed a Cronbach's Alpha of .88 in the present study.

3.2.2 Self-awareness of management competencies (aim 2)

Two items of T3 Questionnaire were developed to measure, at T3, self-awareness of management competencies and achievement of aim 2 (i.e., to increase awareness of managers' own behaviors and development needs): (1) "To what extent did the self-reflection exercise (and the final score) help you understand your management style?" and (2) "To what extent has the monitoring of the competence chosen been useful for you to better understand your management style?". The scale showed a Cronbach's Alpha of .86.

3.2.3 Satisfactory action plan (aim 3)

At T3 the outcome variable of the intervention (and the achievement of aim 3, i.e., creating a satisfactory action plan for development) was measured with two items of T3 Questionnaire: (1) "How satisfied are you with your personal action plan?" and (2) "To what extent do you think you can implement your action plan?". The scale showed a Cronbach's Alpha of .85.

3.2.4 Understanding of self-reflection activities (moderator)

Three items of T1 Questionnaire were developed to measure T1 perceptions about the self-reflection activities to be performed in the following weeks: (1) “To what extent is the planning of subsequent activities clear to you?”; (2) “To what extent do you think the following activities will be useful to you?”; and (3) “To what extent do you intend to engage in subsequent activities?”. The scale showed a Cronbach’s Alpha of .77.

3.2.5 Overall project perceptions (control variable)

Three items of T1 Questionnaire were adapted for this study based on existing literature on process evaluation (e.g., Nielsen *et al*., 2007; Sørensen and Holman, 2014) and measured at T1: (1) “To what extent did you understand the aims of the activities on "management competencies development"?”; (2) “To what extent do you think "management competencies development" activities can help to solve your work problems?”; and (3) “How useful do you think "management competencies development" activities are?” Cronbach’s Alpha was .66.

3.2.6 Stress Management Competency Indicator Tool (SMCIT)

Finally, the 66-item SMCIT (Yarker *et al*., 2008) was used in its “self-reflection exercise” format at T2. This was selected over the short 36-item version because it allows self-reflection on a greater range of behaviors. Moreover, the lengthy scale did not present a challenge to overall questionnaire length since no further research variables were measured at this point (T2). Participants completed the SMCIT, computed the scores, and detailed the competency that they had selected to develop. The final score for each of the four MCs is expressed as a percentage and labelled as a possible development need when equal to or lower than 75. This information was used by participants to improve self-awareness and to select the competency to develop.

3.3 Statistical Analyses

Descriptive, frequencies, and correlation analyses were conducted, and hypotheses were tested with PROCESS macro for IBM SPSS 23 (Hayes, 2018). All variables were screened for normality and outliers prior to analysis. No major violations were detected. To test Hypothesis 1, a mediation model, the aim 1 variable was entered as the predictor, aim 2 as the mediator and aim 3 as the outcome. To test

Hypothesis 2 and 3 (moderated mediation model), the aim 1 variable was entered as the predictor, self-reflection activities as a first-stage moderator of the relationship between the aim 1 and aim 2 variables, and aim 2 as the mediator in the relationship between the predictor's variables and the outcome aim 3, to investigate its indirect effect. Moreover, the overall project perceptions variable was inserted as a covariate. The significance level for all analyses was set at $p < .05$, and a Bootstrap of 5000 was performed for both analyses.

4. Results

4.1 Participants

The sample comprised 58 managers of the Italian local health unit, of which 50 provided the full data needed for the research.

4.2 Descriptive Statistics and Correlations

Mean SMCIT scores were all higher than 75 (**Table 1).** However, the minimum obtained scores for each MC were below the cut-off (ranging from 41.7 to 64.7), indicating individual development needs for at least some managers on all the competencies, replicating the results obtained by Adachi *et al.* (2020) and Houdmont *et al.* (2020). Moreover, each MC was chosen to be monitored by at least some managers, reinforcing the strength of the theoretical framework for which every macro-competency is relevant. Specifically, 15% of participants chose the competence *Being respectful and responsible*, 35% chose *Managing and communicating existing and future work*, 38% chose *Reasoning and managing difficult situations,* and 12% *Managing the individual within the team*.

- INSERT ABOUT HERE TABLE 1 -

Table 1 shows that the mean values of the three aims and the two process variables are positive (i.e., above a score of 3 – the intermediate scale score) indicating good results of the intervention and perception of the project and activities.

Finally, coefficients in **Table 1** also show that the three aims are positively associated with each other; understanding self-reflection activities is associated with aim 1 and aim 2, and overall project perceptions is associated with the three aims.

4.3 Mediation analysis

The result of the mediation model (**H1**) revealed that aim 1 was positively associated with aim 2 (β =.4546, SE=.1433, p=.003, LLCI=.1645, ULCI=.7447), and aim 2 was positively associated with aim 3 (β =.6227, SE=.1492, p=.0002, LLCI=.3204, ULCI=.9250). The total effect of aim 1 on aim 3 was positive and significant (β =.3233, SE=.1577, p=.0473, LLCI=.0040, ULCI=.6426). However, when aim 2 was entered into the model, the relationship between aim 1 and aim 3 decreased and became not significant (direct effect: β =.0402, SE=.1482, p=.7879, LLCI=-.2602, ULCI=.3405), indicating a full mediation role of aim 2 and a significant indirect effect of aim 1 on aim 3 through aim 2 (β =.2831, SE=.1546, LLCI=.0841, ULCI=.6912). Thus, **H1** is supported, and the mediation is categorizable as full and complementary. The mediation analysis summary is presented in **Table 2.**

- INSERT ABOUT HERE TABLE 2 –

4.4 Moderation and moderated mediation analyses

The results of the moderation analyses evaluating **H2** (see **Table 3**) show that there was no association of understanding self-reflection activities with aim 2. However, a significant two-way interaction was found between understanding self-reflection activities and aim 1. It is noteworthy that the control variable 'Overall project perceptions' was positively and significantly associated to aim 2.

- INSERT ABOUT HERE TABLE 3 -

The nature of the interaction is depicted in **Figure 3**, showing that aim 1 and aim 2 were positively associated when understanding self-reflection activities was high (+ 1SD; β =.8271, SE=.2777; LLCI=.2634, ULCI=1.3908) or average (M; β =.5068, SE=.2168; LLCI=.0668, ULCI=.9469). At a

lower level, the association between aim 1 and aim 2 was not significant (- 1SD; β =.1865, SE=.2003; LLCI=-.2200, ULCI=.5931). Thus, **H2** is supported, and the moderation, as predicted, can be described as enhancing interaction.

- INSERT ABOUT HERE FIGURE 3 -

Finally, the result of the moderated mediation (i.e., the mediated relation varies across levels of a moderator) was significant (β =.2720, SE=.1451; LLCI=.0554, ULCI=.6335), supporting **H3**. As the perception of understanding self-reflection activities decreased, the indirect effect of aim 1 on aim 3 through aim 2 decreased, becoming non-significant for low values of the moderator (see **Table 4**). The model explained 45% of action plan variance ($p < .001$).

- INSERT ABOUT HERE TABLE 4 -

5. Discussion

Interventions aimed at developing manager behaviors are recommended as primary interventions to prevent stress and enhance well-being (Kelloway and Barling, 2010; WHO, 2022). This intervention study extends knowledge of the MCPARS framework as a focused preventive strategy in several ways, with implications for future research and practice.

First, our findings offer further support for the MCPARs theoretical framework, confirming findings of Adachi *et al.* (2020) and Houdmont *et al.* (2020) who showed that all four MCs appeared relevant in their samples. By finding that every MC was selected for development by some participants, we further showed that all four MCs have practical value in an intervention context.

Second, the descriptive results extend our understanding of the MCPARS application, confirming a generally positive perception of the intervention (Donaldson-Feilder *et al.,* 2009; Adachi *et al*., 2020), and the intervention modality could be considered an additional validated choice for developing MCs using the MCPARS. This modality could be more important where a workplace health promotion culture is scarce (the intervention paradox described by Nielsen and Randall, 2013). By focusing on the key

role of supervisors and adopting the intervention protocol (particularly aim 1 and aim 2), organizations could create or sustain organizational messages on the importance of good jobs and the management competencies that the organization values and rewards. Thus, the self-reflection exercise could appeal if contextual constraints are present (e.g., latent conflicts and low organizational maturity that limit possibilities for involving employees in upward feedback) to introduce supervisors to the expected managerial competencies, increase self-awareness and reinforce a healthy culture. Particularly in this case, however, to avoid contrasting messages and increase the sustainability of the intervention, it is important that the action directed at supervisors is designed into existing initiatives and policies concerning work-related stress and well-being (Donaldson-Feilder et al. 2009) and integrated with other organizational actions that could be needed, involving other stakeholders and/or level of intervention in a strategic and dynamic perspective on health and well-being (e.g., Watson et al., 2024).

Third, the main contribution of our study concerns the understanding that the three aims described by Donaldson-Feilder *et al.* (2009) can be viewed hierarchically, with increased self-awareness (aim 2) mediating the relationship between understanding the importance of their behavior (aim 1) and action planning (aim 3). This is consistent with the literature about multi-source feedback and personal development (e.g., London and Smither, 1995; McCarthy and Garavan, 2001; Bracken and Rose, 2011), and highlights the importance giving attention to the achievement of each aim during the design phase; the interruption of the causal chain could invalidate the expected outcome. In practice, this means trainers should not make assumptions about how managers see their role and should take time to share contextual information and help managers understand why they play an important role. In particular, the full mediation effect that we found indicates the important role of managers' awareness of their own behaviors and development needs (the mediator) and that raising awareness of the importance of manager behavior alone is not sufficient in bringing about action. This has significant implications for training managers, particularly in the context of micro-learning (Leong *et al.,* 2021), where reflection activities are unlikely to be embedded given the time-restrictive format. Future studies could evaluate this mediation process in the context of an intervention that uses upward feedback. As the three aims of the workshop are the same (i.e., importance MCs, awareness, action plan), we can expect a similar

hierarchical link between them. Confirmation of this relationship could inform the design of the specific activities and their organization in the upward-based intervention.

Finally, our results on the conditions required to facilitate self-reflection activities lend support to the importance of including previously identified process variables (perceptions of specific activities, in our case) to better explain the outcomes of an intervention. As expected, participants' perceptions about activities strengthened the relationship between understanding the importance of their roles and behaviors (aim 1) and self-awareness (aim 2) so that the latter is higher only for middle or high scores in the moderator. This highlights the need to carefully design the explanation to participants of intervention activities and the program logic. Even if this is a well-known important requirement of interventions (see, for example, von Thiele Schwarz *et al.,* 2021, Principle 4), it is not always done, or, at least, it is rarely reported and evaluated in the scientific literature. We recommend that interventions aimed at developing the MCs (using self-reflection or upward feedback) carefully design and implement the delivery of information related to the overall project and the activities and their measurement and evaluation during and after the intervention.

5.1 Limits of the Study

The intervention involved 50 participants and in a single organizational context, limiting external validity. Yet the sample size is comparable to similar studies (e.g., Adachi *et al*., 2020; Mosson *et al.,* 2018) and justified by the intensity of activities, the level of participants, and the single organizational context. Additionally, although the measures we adopted were based on previous work (e.g., Nielsen et al., 2007; Sørensen & Holman, 2014), such measures were not developed by following rigorous validation procedures (see e.g., Boeteng et al., 2018) and some studies recommend tailored and context-specific measures (e.g., Randall et al., 2009) that are widely used (Abilgard et al., 2016). Moreover, not all the collected measures were separated in time, which raises concerns regarding causality. Overall, further research is needed adopting more rigorous research design with all the measures separated in

time, to evaluate if the mechanism we found can be generalized to similar interventions or those using upward feedback.

Our intervention was conducted at the end of 2019. Due to the Covid-19 pandemic no further activities were possible. We lack evidence about change in MCs following the intervention and the action plan. However, changes were detected by both Donaldson-Feilder *et al.* (2009) and Adachi et al. (2020) adopting a similar intervention strategy. Future studies should examine if and how aim 3 (i.e., a satisfactory action plan) is linked to subsequent effective behavior change and employees' work environment and well-being.

Lastly, without the use of upward feedback, the intervention may be influenced by the supervisor's self-assessment only and possible self-serving favorable biases. We tried to reduce this risk by increasing the personal motivation of participants towards a genuine self-reflection. Organizations should carefully evaluate this risk and in "mature" contexts, possibly implement upward feedback.

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Table 1. Descriptive Statistics and correlations for all study variables.

	MEAN (SD)	1	2	3	4	5	6	7	8
1 Competency 1: RR	81.81 (6.90)	-							
2 Competency 2: MCW	79.00 (9.18)	.73**	-						
3 Competency 3: RDS	77.79 (10.54)	.49**	.74**	-					
4 Competency 4: MIT	84.63 (6.75)	.29*	.47**	.59**	-				
5 AIM 1	3.74 (0.76)	.08	-.05	.08	.19	-			
6 Understanding of self-reflection Activities	4.05 (0.71)	.27	.01	.01	.03	.78**	-		
7 AIM 2	3.87 (0.75)	.05	.01	.21	.15	.46**	.35*	-	
8 AIM 3	3.50 (0.77)	.18	.29	.48*	.24	.32*	.14	.65**	-
9 Overall project perceptions	3.80 (0.58)	.41**	.23	.12	.08	.76**	.71**	.52**	.32*

Note: RR=Being respectful and responsible; MCW= Managing and communicating existing and future work; RDS=Reasoning and managing difficult situations; MIT=Managing the individual within the team; AIM 1= Importance of positive manager behaviors; AIM 2= Self-awareness of management competencies; AIM 3= Satisfactory Action Plan.

* $p<0.05$, ** $p<0.01$

Table 2. Mediation analyses summary.

Relationship	TOTAL EFFECT (p value)	DIRECT EFFECT (p value)	INDIRECT EFFECT	Confidence Interval indirect effect	CONCLUSION
AIM 1 → AIM 2 → AIM 3	.3233 (.0473)	.0402 (.7879)	.2831	LLCI=.0841 ULCI=.6912	Full mediation

Note: LLCI, lower level of 95% confidence interval; ULCI, upper level of 95% confidence interval; AIM 1= Importance of positive manager behaviors; AIM 2= Self-awareness of management competencies; AIM 3= Satisfactory Action Plan.

Table 3. Moderating effects of Understanding of self-reflection Activities (UsrA) on the association between AIM 1 and AIM 2.

Outcome: AIM 2	ß	SE	LLCI	ULCI
Costant	1.5023	.8954	-.3155	3.3201
AIM 1	.5068*	.2168	.0668	.9469
UsrA	-.0416	.2143	-.4767	.3934
AIM 1 X UsrA	.4463**	.1502	.1414	.7512
Overall Project perceptions	.5742*	.2358	.0956	1.0528

Note: LLCI, lower level of 95% confidence interval; ULCI, upper level of 95% confidence interval; AIM 1 = Importance of positive manager behaviors; AIM 2 = Self-awareness of management competencies; UsrA = Understanding of self-reflection Activites

* $p<0.05$, ** $p<0.01$

Table 4. Conditional indirect effect of AIM 1 on AIM 3 via AIM 2 for values of the moderator

Levels of UsrA	Conditional indirect effect	SE	LLCI	ULCI
LOW UsrA	.1137	.1543	-.1937	.4527
AVERAGE UsrA	.3089	.1811	.0284	.7383
HIGH UsrA	.5040	.2528	.1231	.6363

Note: LLCI, lower level of 95% confidence interval; ULCI, upper level of 95% confidence interval.

UsrA = Understanding of self-reflection Activites

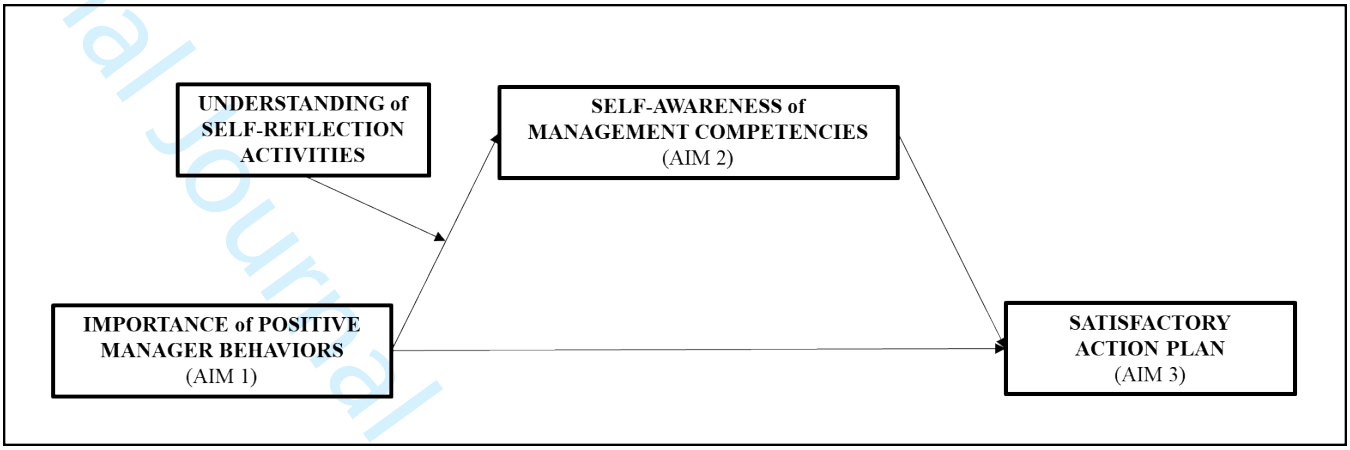

Figure 1. Conceptual diagram of the moderated mediation model.

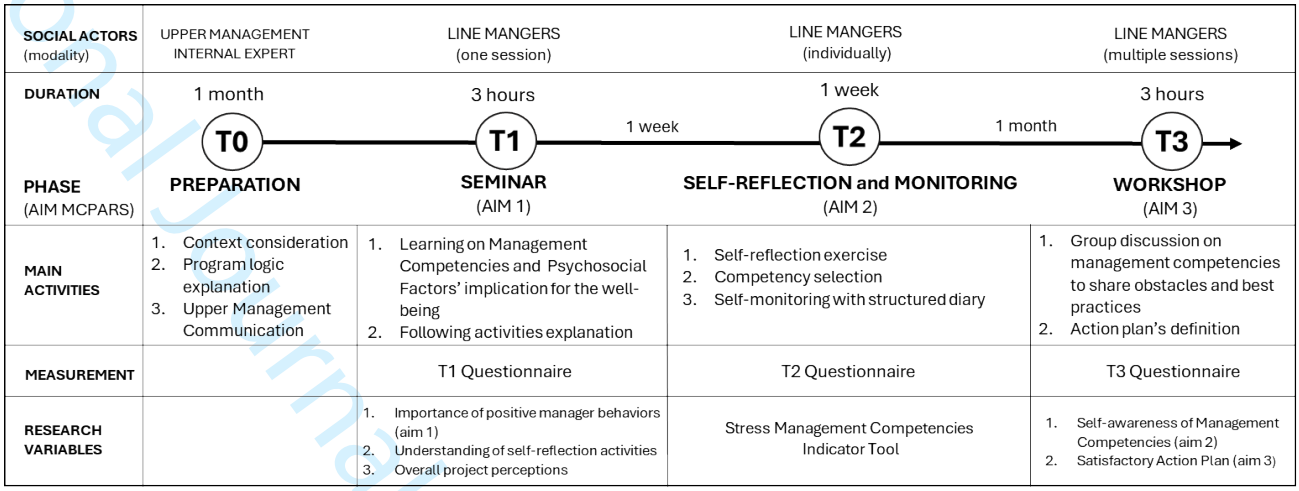

Figure 2. Intervention Design and Implementation

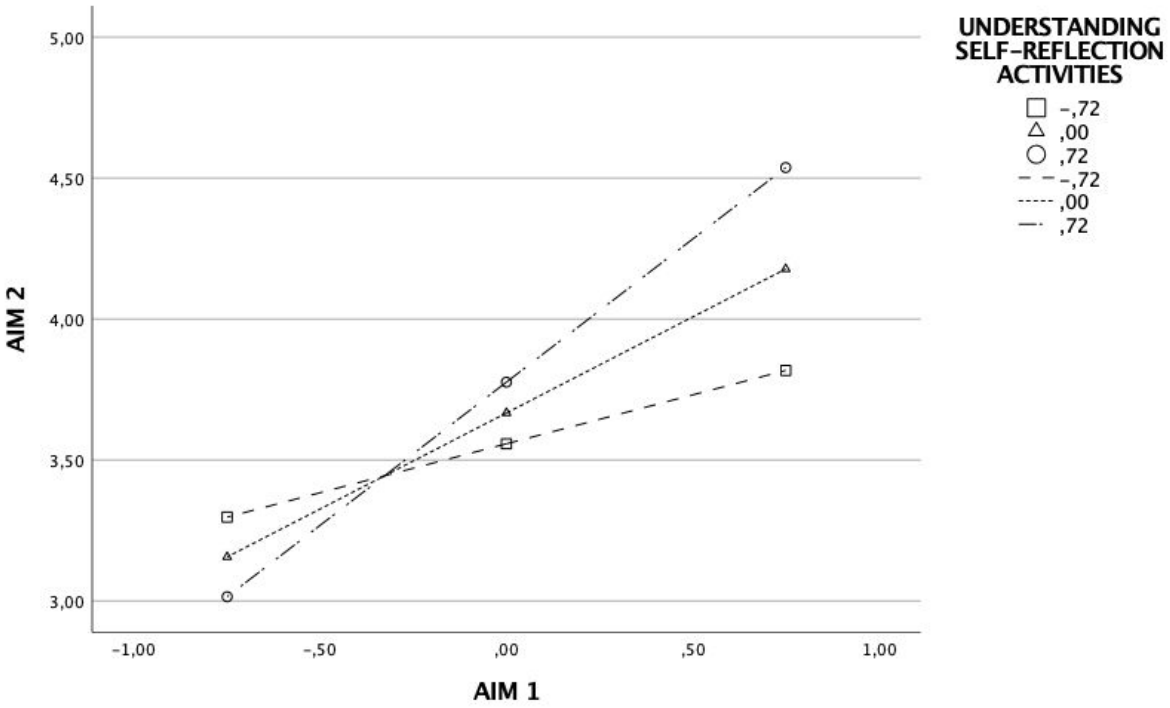

Figure 3. The moderating effect of Understanding of self-reflection activities in the association between AIM 1 (Importance of positive manager behaviors) and AIM 2 (Self-awareness of management competencies)