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Medical doctors taking the lead: transforming workplaces towards sustainable employability

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Citation

Duijnhoven, A. van. (2026, September 17). *Medical doctors taking the lead: transforming workplaces towards sustainable employability*. Retrieved from <https://hdl.handle.net/1887/4310019>

Version: Publisher's Version

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Downloaded from: <https://hdl.handle.net/1887/4310019>

Note: To cite this publication please use the final published version (if applicable).

CHAPTER 1

General introduction

Sustainable employability of medical doctors

Medical doctors play an essential role in the viability of healthcare. Ensuring that they can function in a healthy, satisfied, engaged, and productive manner over the long term is important for addressing today's major healthcare challenges and safeguarding accessible, available, and high-quality care (De Vos et al., 2020; Fleuren et al., 2020; Ogugua et al., 2024; Rotenstein et al., 2018; Shanafelt & Noseworthy, 2017). Promoting the Sustainable Employability (SE) of medical doctors is therefore imperative. SE refers to an individual's ability to continue functioning effectively at work and in the labour market over time, without their employment having a negative impact on this ability, and preferably enhancing it (Fleuren et al., 2020). According to Fleuren et al. (2020) SE is a multidimensional and dynamic construct that encompasses both negative and positive indicators of functioning. It not only concerns the prevention of long-term complaints or dysfunction, such as burnout, but also the maintenance and enhancement of positive work-related states, such as work engagement and job satisfaction, which are essential for sustainable functioning across the career span.

The World Health Organization (2020) identifies investing in the people who safeguard population health as one of the ten most urgent current global health challenges. Within this context, growing concerns have been raised about the SE among medical doctors, reflected in high levels of burnout, work disengagement, and job dissatisfaction (Domagała et al., 2019; Fleuren et al., 2020; Rao et al., 2020; Shanafelt et al., 2016; West et al., 2018). Medical doctors deliver complex, highly specialised care, and are indispensable to population health, yet they increasingly operate under demanding conditions. Rising healthcare demands, persistent workforce shortages, and ongoing financial constraints place substantial strain on medical doctors' work environments (Boniol et al., 2022; Ogugua et al., 2024; Shanafelt & Noseworthy, 2017). These systemic pressures translate into unfavourable job factors, including high job demands and insufficient job resources. Examples of job demands that are particularly characteristic of medical doctors' work include emotionally and cognitively demanding situations, such as bearing continuous responsibility for patients' lives, the need to sustain continuous vigilance to minimise the risk of errors, making life-and-death decisions, caring for patients in medically hopeless circumstances, and/or dealing with patient death. Because these demands are inherent to the profession and difficult to modify, it is important to ensure that other job demands - such as high time pressure, long working hours, heavy workloads, frequent on-call duties, and extensive administrative responsibilities - remain manageable and are balanced by adequate job resources. However, medical doctors frequently report insufficient job resources, including reduced autonomy, limited control

over their work, inadequate rewards, insufficient social support from colleagues and supervisors, poor collaboration, ineffective leadership, insufficient opportunities for recovery, and restricted opportunities for professional development (Domagała et al., 2018; Hoff et al., 2015; Patel et al., 2018; Perreira et al., 2018; Rothenberger, 2017; Shanafelt et al., 2016; Shanafelt & Noseworthy, 2017; West et al., 2018). High job demands and insufficient job resources are, in turn, associated with burnout, job dissatisfaction, and work disengagement among medical doctors (Domagała et al., 2018; Perreira et al., 2018; West et al., 2018), ultimately undermining their long-term employability. These patterns underscore that improving SE requires addressing the root causes of job stress - namely medical doctors' work environments.

Diminished SE among medical doctors has far-reaching consequences at multiple levels. At the individual level, compromised SE is associated with serious health problems, including substance abuse, broken relationships, depression, anxiety, physical health problems, and increased suicide risk. At the healthcare system-level, it contributes to occupational dropout, reduced work hours, early retirement, turnover, and productivity loss. Moreover, compromised SE has been linked to reduced quality of care, including medical errors, lower patient satisfaction, and increased malpractice risk (Patel et al., 2018; Shanafelt & Noseworthy, 2017; West et al., 2018; Williams et al., 2020). These consequences further diminish medical doctors' long-term functioning and exacerbate already critical healthcare staff shortages (Boniol et al., 2022; De Vos et al., 2020; Fleuren et al., 2020).

Strengthening medical doctors' SE is therefore essential: not only to protect their own health and ensure their ability to meet today's major healthcare challenges, but also because SE-related factors influence the core outcome of healthcare: the quality and safety of patient care. Society, the profession, and medical training must recognise that, alongside the core technical and clinical skills of the profession, medical doctors' self-insight, recognition of their own humanity, and attention to their work environment and personal well-being are essential for providing high-quality patient care (Shanafelt, 2021).

To address this challenge, deeper insight is needed into the key job factors associated with SE. While substantial research has examined job factors in relation to medical doctors' burnout, considerably less attention has been paid to positive core indicators of SE, such as job satisfaction and work engagement. This imbalance is noteworthy, as sustained health, satisfaction, and engagement are all critical for long-term functioning and career sustainability (De Vos et al., 2020; Fleuren et al., 2020). Examining these SE indicators jointly is therefore necessary to obtain a more complete understanding of how job factors

shape medical doctors' SE. Such knowledge is a crucial prerequisite for identifying leverage points for effective intervention.

Organisational-level workplace interventions

Given the systemic pressures associated with compromised SE among medical doctors, implementing organisational-level workplace interventions is essential. Shanafelt (2021) describes a clear shift in how medical doctors' distress is perceived and addressed. The shift moved from limited awareness - and at times even disregard - of medical doctors' distress, to growing recognition of distress, with its causes primarily attributed to individual factors and only partly to organisational ones - yet with solutions still focused on the individual. More recently there has been increasing emphasis on addressing job-related causes of distress through organisational- and system-level solutions. Because the root causes of compromised SE lie largely within the job itself - specifically in medical doctors' work environments - organisational-level workplace interventions hold considerable potential to limit job demands and enhance job resources (Nielsen et al., 2010). Such organisational-level approaches are more suitable than solely individual-level approaches, as they address the systemic causes of workplace stress and SE problems and avoid forms of victim blaming by not locating the solution at the individual level (Shanafelt, 2021; Shanafelt & Noseworthy, 2017). To maximise the impact of organisational-level workplace interventions on improving medical doctors' SE, previous research suggests that an integrated, multilevel approach is important. This requires recognising that changes in the work environment and job design are fundamental to fostering healthy, satisfied, and engaged medical doctors, while also aligning interventions with needs at other levels, including the individual and healthcare system levels (West et al., 2018; Shanafelt & Noseworthy, 2017).

Organisational-level workplace interventions are defined as: "planned, behavioural, theory-based actions to remove or modify the causes of job stress (stressors) at work and aim to improve the health and well-being of participants" (Nielsen et al., 2010, p. 234). These interventions seek to improve working conditions by targeting job factors, thereby enhancing health and well-being outcomes (Nielsen et al., 2010; Nielsen & Noblet, 2018). Such interventions have also been implemented among medical doctors. Examples include the introduction of Electronic Health Records, duty-hour limitations, schedule redesigns, and the use of scribes (DeChant et al., 2019). Most interventions implemented among medical doctors focus on reducing burnout, while only a minority target positive outcomes such as job satisfaction (e.g., De Simone et al., 2021; DeChant et al., 2019; Naehrig et al., 2021; West et al., 2016). Moreover, most interventions address only a single

outcome of SE. Given that SE is a multidimensional and dynamic construct (Fleuren et al., 2020), both negative and positive indicators of functioning should be targeted.

Organisational-level workplace interventions appear more successful when they do not rely on top-down approaches, but instead adopt Participatory Action Research (PAR) approaches (Nielsen et al., 2025; Nielsen & Christensen, 2021). In PAR, employees, managers, and other stakeholders act as active agents in the intervention, engaging them directly in its design, implementation, and evaluation (Nielsen et al., 2010; Nielsen & Randall, 2013). PAR strengthens the fit between the intervention and the organisational context, draws on participants' expertise, skills, and knowledge of their specific job, work environment, and context, and enhances their knowledge and skills in developing, implementing, and evaluating organisational changes. Ultimately, PAR promotes the sustainability and embeddedness of interventions by ensuring that employees possess the knowledge and skills needed to continue improving their working conditions after the formal intervention has ended (Nielsen et al., 2010, 2025; Nielsen & Christensen, 2021; Nielsen & Randall, 2013; Roodbari et al., 2021, 2023).

Taken together, these insights underscore the need to deepen our understanding of organisational-level workplace interventions that have been implemented to improve SE among medical doctors, and subsequently, based on these insights, to develop, implement, and evaluate a new organisational-level workplace intervention - preferably incorporating PAR - that directly targets the root causes of stress in work environments to ultimately improve SE.

Job Demands-Resources model

Interventions that are theory-based are the most effective in addressing job stress and well-being (Burgess et al., 2020). The Job Demands-Resources (JD-R) model provides an appropriate theoretical framework for developing, implementing, and evaluating organisational-level workplace interventions (Bakker et al., 2023; Bakker & Demerouti, 2017; Schaufeli, 2017). Schaufeli (2017) argues that the JD-R model is suitable for monitoring job factors and enhancing SE outcomes. Its strengths include adaptability across organisational contexts, inclusion of both negative (e.g., burnout) and positive outcomes (e.g., work engagement), comprehensive coverage of relevant job factors, and its value as a tool for communication between researchers, employees, and employers. Furthermore, Bakker et al. (2023) emphasise the JD-R model's utility in guiding organisational-level interventions. They highlight the importance of continuously assessing and optimising job factors within a multilevel structure, where employees, teams, and

organisations dynamically interact. It also supports the possibility of enhancing SE outcomes by strengthening key job demands and job resources.

The JD-R model distinguishes between job demands - “the physical, psychological, social, or organizational aspects of the job that require sustained physical, cognitive, and/or emotional effort and are therefore associated with certain physiological and/or psychological costs” - and job resources - “the physical, psychological, social, or organisational aspects of the job that have motivating potential, that are functional in achieving work goals, that regulate the impact of job demands, and that stimulate learning and personal growth” (Bakker et al., 2023, p. 33). Job demands deplete energy and can lead to burnout through the health impairment process, whereas job resources fulfil basic psychological needs and stimulate motivational outcomes such as work engagement through the motivational process (Bakker et al., 2023; Bakker & Demerouti, 2017). The JD-R model has also been applied to the specific context of medical doctors. There is substantial evidence for associations between job demands and job resources and SE indicators among medical doctors, particularly burnout (Domagała et al., 2018; Hoff et al., 2015; Patel et al., 2018; Perreira et al., 2018; Rothenberger, 2017; Shanafelt et al., 2016; Shanafelt & Noseworthy, 2017; West et al., 2018).

Beyond job demands and job resources, the JD-R model has been extended with Psychosocial Safety Climate (PSC) (Dollard & Bakker, 2010), a critical job-related determinant of SE (Amoadu et al., 2023; Hu et al., 2022; Karatuna et al., 2025). PSC is defined as: “policies, practices, and procedures for the protection of worker psychological health and safety” (Dollard & Bakker, 2010, p. 580). Dollard and Bakker (2010) identified PSC as a “cause of causes”: organisational policies, practices, and procedures that indirectly protect employees’ psychological health and safety by preventing excessive job demands and ensuring sufficient job resources. This is now well supported across a growing body of research (e.g., Amoadu et al., 2023; Hu et al., 2022; Karatuna et al., 2025). PSC has been examined extensively in the general working population, academic staff, and healthcare staff (Amoadu et al., 2023). However, studies focusing specifically on medical doctors are scarce. Only Hu et al. (2022) examined medical doctors, in a broader healthcare sample also including nurses and medical technicians, with medical doctors representing the smallest subgroup. Creating a favourable PSC requires coordinated efforts across all organisational layers, including top management priority, direct supervisor support and commitment, constructive group norms and behaviours, and effective communication and participation in reducing employees’ psychosocial stress and strain (Bronkhorst, 2015; Bronkhorst & Vermeeren, 2016; Dollard & Bakker, 2010; Loh et al., 2024).

As medical doctors face unique job demands, such as high time pressure, emotionally challenging patient care, and extensive administrative duties (e.g., West et al., 2018), the protective effects of PSC may be particularly critical in this population. Understanding how PSC shapes key job demands and job resources is therefore essential for identifying the mechanisms through which SE can be promoted in this group. These insights should subsequently inform the development and implementation of organisational-level workplace interventions aimed at improving SE among medical doctors.

Effect and process evaluation of organisational-level workplace interventions

Once organisational-level workplace interventions have been developed and implemented, they should be evaluated in an effective way (Nielsen & Miraglia, 2017; Nielsen & Noblet, 2018). The broader literature emphasises that evaluating such interventions requires more than determining whether intended outcomes have improved; it requires understanding what works, for whom, and under which circumstances (Burgess et al., 2020; Nielsen & Miraglia, 2017; Nielsen & Noblet, 2018). Evaluating both the “chain of effects” and relevant “process factors” is essential to determine whether an intervention leads to improved outcomes, and why it may have succeeded or failed. Kalani et al. (2018), for instance, noted in their systematic review of systematic reviews on burnout interventions for medical doctors, that numerous moderating and mediating factors can influence intervention effects, and that without examining these factors, conclusions about effectiveness should be drawn with caution, as what works in one specific group or organisation does not automatically work in another setting.

Job factors may function as mediating mechanisms within the chain of effects. This chain proposes that organisational-level workplace interventions implement organisational changes that target specific job factors, and that improvements in these job factors subsequently enhance employee health and well-being (Nielsen & Abildgaard, 2013; Nielsen & Miraglia, 2017). When relationships are observed between targeted job factors and improved health and well-being outcomes, it becomes more plausible that the intervention produced the observed changes (Nielsen & Abildgaard, 2013). These chain of effects may be simple - where one job factor leads directly to one or more health and well-being outcomes (Aust et al., 2023) - or more complex, where improvements in one job factor trigger improvements in other job factors, ultimately influencing health and well-being (Nielsen & Abildgaard, 2013).

Process factors, in turn, may act as moderating influences that facilitate or hinder the effectiveness of organisational-level workplace interventions. They help explain why an intervention may fail, even when it contains theoretically effective elements. When

implementation processes fail, intended effects cannot be realised (Nielsen & Miraglia, 2017; Nielsen & Noblet, 2018; Nielsen & Randall, 2013). It is therefore important to measure multiple process factors, conduct extensive process evaluations, and assess these process factors repeatedly throughout the intervention, as they may change over time (Fox et al., 2022; Havermans et al., 2016; Kompier & Aust, 2016; von Thiele Schwarz et al., 2021). Nielsen and Randall (2013) provide a useful theoretical framework, distinguishing process factors related to the intervention context (e.g., organisational characteristics or concurrent events), intervention design and implementation processes (e.g., employee involvement, management support), and employees' mental models (e.g., employees' appraisal of the intervention). These insights from process evaluations help translate theory into practice by clarifying what should be taken into account during the implementation of organisational-level workplace interventions, and they also provide a basis for learning how such intervention can be improved in the future. This underscores the importance of assessing the effectiveness of organisational-level workplace interventions on medical doctors' SE, while also examining chain of effects and key process factors before a firm conclusion can be drawn about their effectiveness.

Thesis aim and outline

To summarise, compromised SE among medical doctors must be addressed to support their long-term functioning and prevent far-reaching consequences for both individuals and the healthcare system. This entails reducing burnout, and enhancing work engagement and job satisfaction. Because compromised SE stems from systemic characteristics of medical doctors' work environments, organisational strategies are required. Interventions that strengthen PSC, reduce job demands, and enhance job resources - core components of the JD-R model extended with PSC - are therefore essential. Therefore, organisational-level workplace interventions, particularly those incorporating PAR approaches, hold promise for improving SE by altering work environments. Evaluating such interventions requires not only assessing whether outcomes improve, but also examining chain of effects and process factors to determine what works, for whom, and under which circumstances.

Against this background, this thesis aimed:

AIM 1: To identify whether PSC and which job demands and job resources determine medical doctors' SE and act as drivers of change within SE-focused organisational-level workplace interventions;

AIM 2: To evaluate the effectiveness of organisational-level workplace interventions in improving medical doctors' SE;

AIM 3: To examine the process factors that facilitate or hinder the effectiveness of SE-focused organisational-level workplace interventions among medical doctors.

To address these aims, we applied a two-pronged strategy:

(1) Synthesising existing evidence on implemented and evaluated organisational-level workplace interventions targeting SE among medical doctors (Chapter 2).

(2) Generating new evidence by implementing and evaluating a new organisational-level workplace intervention ourselves, including a PAR approach, among groups of Dutch medical doctors (Chapters 3, 4, 5, and 6).

Chapter 2 presents the results of a narrative systematic review on the effectiveness of organisational-level workplace interventions in improving SE - burnout, work engagement, and job satisfaction - among medical doctors, the job factor mechanisms responsible for their effectiveness, and the process factors that influence their effectiveness.

Chapter 3 outlines the study protocol for a two-year, PAR-based organisational-level workplace intervention implemented among Dutch medical doctor groups. This chapter describes the intervention in detail, how its effectiveness will be evaluated, including whether changes in PSC, job demands and job resources mediate the intervention effects on SE indicators, and which process factors influence its effectiveness on job factors and SE indicators.

Chapter 4 describes the direct and indirect relationships between PSC, job demands, job resources, and SE indicators in medical doctors, based on the baseline data of the organisational-level workplace intervention introduced in Chapter 3.

Chapter 5 evaluates the effectiveness of the organisational-level workplace intervention in improving medical doctors' SE indicators and job factors, and examines the chain of effects - specifically whether and which improvements in job factors relate to improvements in SE indicators.

Chapter 6 evaluates the intervention process, assessing whether process factors - intervention design and implementation processes, medical doctors' mental models, and intervention contexts - influence the intervention's effects on job factors and SE indicators.

Finally, the main findings are summarised in **Chapter 7** and discussed in **Chapter 8**, which also covers practical implications, limitations, suggestions for future research, and the conclusion.

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