Exploring Mindfulness as a Tool for Recognition and Prevention of Burnout in Construction and Engineering

Sara Hajikazemi, Hedley Smyth, Meri Duryan, Fei Yuan and Chunxue Liu

Abstract

Purpose: Employees in the construction and engineering sectors face significant risks of burnout and job stress due to high-pressure environments, tight deadlines, and demanding workloads. These industries often require long hours and intense focus, leading to physical and mental exhaustion. The constant need to meet project goals and manage complex tasks can result in chronic stress, negatively impacting workers' health and productivity. Without effective stress management strategies and organizational support, employees are at a heightened risk of experiencing burnout, which can lead to decreased job satisfaction, increased absenteeism, and higher turnover rates.

Design/methodology/approach: The research employs a qualitative approach, utilizing semi-structured interviews with 32 professionals, including construction and engineering project team members and managers. Grounded in the Job Demands-Resources theory, the study investigates the role of cognitive-behavioural techniques, specifically mindfulness, as a job resource to prevent burnout. The methodology focuses on exploring mindful well-being as a mitigation strategy and emphasizes the need for organizational mindfulness to create a supportive culture and systemic practices within construction and engineering organizations.

Findings: The research findings indicate that mindfulness-based practices can significantly help construction and engineering professionals recognize early warning signs of burnout, serving as a valuable personal resource. However, the study also emphasizes that sustainable solutions to burnout require organizational mindfulness. This involves fostering a supportive culture, implementing systemic practices, and prioritizing such practices, within these organizations. By integrating mindfulness at both individual and organizational levels, the research suggests a comprehensive approach to effectively mitigate burnout and enhance overall well-being in these high-stress industries.

Originality/value: The originality and value of this research lie in its tendency to explain that while mindfulness is known and applied as a useful tool for recognizing and preventing burnout, it is not sufficient on its own. The research underscores the necessity of fostering an organizational culture that prioritizes mental health and well-being in all aspects. Additionally, it stresses the importance of organizational mindfulness to ensure a sustainable mitigation strategy for addressing job stress and burnout. This dual focus on individual and systemic approaches offers a holistic solution to enhance well-being and productivity in high-stress industries.

Keywords: Burnout; Mindfulness; Construction and engineering organisations; Job Demand-Resources theory; Early warning signs

Introduction

Job stress has been identified as a prevalent occupational hazard that brings negative impacts on physical health, psychological wellbeing, and work performance (Maslach & Leiter, 2008). If not managed effectively, chronic stress can lead to burnout, which can cause severe psychological and psychophysiological impairments that significantly impact a worker's effectiveness and may even lead to inaction (Maslach et al., 2001; Demerouti & Bakker, 2011). This phenomenon is more common among project-based employees, such as those working in construction and engineering, as opposed to non-project-based employees, due to complex job requirements, tight deadlines, restricted budgets, changing technologies, and global competition (Turner et al., 2008; Peticcia-Harris et al., 2015; Cicmil et al., 2016; Mubarak et al., 2022). We broaden the scope in two ways. First, it is not only those working in project delivery that experience stress, but also those in the organisation responsible for delivery. International comparative studies consistently indicate markedly elevated levels of burnout among construction professionals and managers (Lingard & Francis, 2006; Gumusburun Ayalp, 2022; Lingard & Turner, 2022) due to the competing constraints imposed by organisations in project environments, such as demanding timetables and budgets, complexity, and project uncertainty. Second, prior studies have focused primarily upon causes (e.g. Pinto et al., 2014) whereas this study focuses primarily upon management and mitigation.

Many studies have investigated the adverse effects of burnout on employees in diverse sectors, including education, healthcare and construction (Lingard & Francis, 2006; Meliá & Becerril, 2007; Maslach & Leiter, 2008; Yip & Rowlinson, 2009; Abenavoli et al., 2013; Hales & Chakravorty, 2016; Luken & Sammons, 2016; Kang et al., 2019; Lee at al., 2020; Zhang et al., 2020; Wu et al., 2023; Leung et al., 2024). These studies suggest the need for managing responses and interventions of mitigation.

We have selected the Job Demand-Resource (JD-R) theory as the theoretical underpinning for this research as it offers a more thorough understanding of employee wellbeing and performance than other theories. Over time, this theory has successfully synthesised insights from diverse perspectives on job stress and work motivation, incorporating two-factor theory (Herzberg 1966), job characteristics theory (Hackman & Oldham 1976), the job demands–control model (Karasek 1979), the effort–reward imbalance model (Siegrist 1996), and conservation of resources theory (Hobfoll et al. 2018). The resulting comprehensive theory integrates the strengths of all these approaches (Bakker et al., 2023).

Based on JD-R theory, job demands are the antecedents of burnout and the type of demands help signal the need to intervention due to any negative impact on employee wellbeing and performance. Further, job resources are critical antecedents of work engagement and intervention to induce positive consequences for employees and organisations (Bakker et al., 2014, 2023).

One resource to promote work engagement is mindfulness, which has become increasingly popular in different sectors to help manage stress and burnout (Goodman & Schorling, 2012; Liang & Leung, 2015; Gregoire & Lachance, 2015; Hafenbrack, 2017; Daniel et al., 2022; Bakker et al., 2023). Mindfulness research shows positive impact on individuals and organisations, providing cost-effective solutions to enhance employees' work-related mental health (Kohls et al., 2009; Michel et al., 2014; Van Gordon et al., 2014; Kiburz et al., 2017; Burton et al., 2017; Hugh-Jones et al., 2018).

Expanding on prior studies examining mindfulness as a valuable job resource for adeptly handling work demands and alleviating burnout risks in various settings, our research seeks to explore the perspectives of individuals within construction regarding burnout. Specifically, we aim to understand whether mindfulness functions as an Early Warning (EW) mechanism to address job-related stress and mitigate the onset of burnout.

To achieve this aim, we build on the work of Edú-Valsania et al. (2022), indicating that employee burnout builds up over time. It typically emerges and is often the consequence of specific characteristics inherent in the work activity. Maslach & Leiter (2008) emphasise the importance of insights into long term changes in stress build up and burnout. We problematise the existing literature by exploring whether mindfulness can function as a preventative approach or in other words an EW tool for identifying extreme stress and burnout actions.

Our study addresses the following research questions:

> RQ1: How do employees within construction and engineering perceive burnout and its contributing factors?
>
> RQ2: To what extent is mindfulness effective as a job resource for employees within construction and engineering to address and prevent burnout?

The study's findings offer valuable insights to construction and engineering organisations, informing them about the effectiveness of mindfulness in mitigating burnout and exploring its potential as a standalone approach or in combination with other strategies across diverse contexts.

Literature review

Job burnout and its context

In 1974, Freudenberger defined burnout as "a set of physical, psychological, and behavioural syndromes among volunteer service workers that include feelings of fatigue, futility, and quickness to anger as a result of excessive occupational demands" (Freudenberger, 1974, p. 161). Maslach & Jakson (1981) later narrowed the concept down. They coined the term "job burnout", to describe the phenomenon of workers experiencing stress not only due to physical factors but also psychological factors such as emotional exhaustion, reduced personal accomplishment and depersonalisation.

Prior research has predominantly focused upon burnout causes, especially in the project domain (e.g. Pinto et al., 2014), and to an extent this has provided a platform for pointing to the impact and negative

outcomes such as decreased wellbeing, reduced productivity, increased absenteeism, and higher compensation claims rates (Brown & Ryan, 2003; Taylor & Millear, 2016).

In construction in particular professionals must often make temporary decisions and occasionally engage in firefighting, defined as the unplanned allocation of resources to address problems identified late in a project's life cycle (Black & Repenning, 2001). Additionally, they frequently face unrealistic expectations and intense pressure to deliver projects on time and within budget (Pinto et al., 2014) while navigating changing expectations regarding the project's scope (Smith et al., 2011). These factors contribute to a heightened risk of negative emotions and psychological issues, including depression and anxiety, among construction professionals. Many in the field also exhibit a tendency to overachieve and mistakenly blame themselves for project failures or mistakes. This self-blame can lead to the internalization of problems and a belief that such challenges are personal shortcomings (Jugdev et al., 2018). This will overtime lead to cynicism and burnout (Sun et al., 2020).

Early warning signs of burnout

EW signs can help practitioners identify burnout. Burnout, stemming from workplace conditions, evolves gradually, and can become chronic over time, posing severe health implications for employees. (Edú-Valsania et al., 2022; Korunka et al., 2010). Burnout often progresses in three stages: emotional exhaustion, cynicism, and reduced professional efficacy (Taylor & Millear, 2016). Burnout is also commonly associated to employee perception that the quality and quantity of available resources are inadequate to meet their demands (Bakker & Demerouti, 2017).

It can manifest differently between individuals. Hence, warning signs may vary from person-to-person and work context, for example those working to deadlines in the main office and those working to deadlines on site. It is perhaps due to the progressive nature of burnout that identifying the EW signs of its development and acting towards prevention of its full-scale consequences, is possible and essential. Recognising any sign can be valuable in identifying and addressing burnout before it progresses and becomes severe. In Table 1, Schaufeli & Enzman (1998) identified five types of EW burnout signals that manifest at three diverse levels (Korunka et al., 2010).

Table 1. Examples of burnout signals at individual, interpersonal and organisational levels (Adapted from Korunka et al., 2010)

Burnout is not merely the product of highly demanding work. When people can no longer manage the tension between job and personal demands, they may exhibit burnout signs. Resultant exhaustion, and sometimes cynicism, are two key EW signs of burnout which can be easily measured according to the Maslach Burnout Inventory, MBI (Maslach & Leiter, 2008). Therefore, EW signs can powerfully point towards proactive intervention to benefit organisations and employees. Shoman et al. (2021) stated predictors can serve as a robust foundation for preventive interventions aimed at enhancing adaptive

coping strategies and leisure activities, while simultaneously reducing job demands and negative job attitudes while avoiding the costs and impact on organisations.

The JD-R theory, burnout, and mindfulness

The Job Demands-Resources (JD-R) theory integrates both job stress and motivational perspectives, explaining how job demands and resources impact employee wellbeing and performance (Bakker & Demerouti, 2017; Van Veldhoven et al., 2020). Burnout, a key concern within this framework, is a process that unfolds in three stages: emotional exhaustion, cynicism, and reduced professional efficacy (Taylor & Millear, 2016). The theory suggests that burnout occurs when employees perceive an imbalance between job demands and available resources, leading to negative work outcomes (Bakker & Demerouti, 2007).

Researchers have proposed various strategies for preventing burnout, categorized into proactive domains such as work, home, and personal factors (Otto et al., 2020). These strategies include reducing job demands, fostering supportive environments, and providing incentives. Supervisors also play a crucial role by minimizing emotional contagion that can contribute to burnout (Chullen, 2014). However, burnout prevention requires a comprehensive approach that addresses individual characteristics, social contexts, and organisational factors (Makara-Studzinska et al., 2021). Korunka et al. (2010) emphasize the necessity of organisational interventions alongside individual-level strategies.

In project-related sectors, especially construction, much research has focused on burnout causes (Lingard et al., 2007; Yip & Rowlinson, 2009), but less attention has been given to early warning (EW) signs. Mindfulness, a potential intervention, has gained attention for its ability to help individuals identify EW signs of burnout, which may improve both personal wellbeing and organisational performance. According to JD-R theory, unfavourable job demands increase exhaustion, while job resources help reduce disengagement (Bakker et al., 2023). Mindfulness-based interventions, already widely used in education and healthcare (Cohen-Katz et al., 2004; Goodman & Schorling, 2012), are being explored for their potential to reduce burnout in the workplace (Daniel et al., 2022).

In the construction sector, mindfulness interventions have been shown to reduce burnout, stress, and improve sleep quality (Aránega et al., 2020; Liang & Leung, 2015; Cohen-Katz et al., 2004). Lomas et al. (2017) demonstrated that mindfulness can improve mental health, job satisfaction, and performance, positioning it as a unique resource within the JD-R framework. This research aims to explore mindfulness as a tool for identifying EW burnout signs, addressing a gap in current studies. The potential for mindfulness to reduce burnout has not been thoroughly investigated, and its mechanisms remain underexplored. The study seeks to understand how mindfulness can be used as a strategic resource to enhance employee wellbeing and performance by identifying early signs of burnout before they escalate into more severe stages.

Methodology

The existing literature highlights a gap in theoretical and empirical research on the effectiveness of mindfulness in detecting early signs and preventing burnout. This study uses a qualitative theory-building methodology (Yin, 2018) to explore how mindfulness contributes to managing wellbeing and mitigating burnout in the construction sector. Specifically, it investigates mindfulness as an early warning (EW) tool for identifying burnout symptoms before they escalate.

The research involves 32 semi-structured interviews with project employees from engineering, construction, and infrastructure sectors across Europe, China, and North America. Participants were selected through purposive sampling, with a focus on individuals involved in project delivery and those managing health, safety, and wellbeing within organisations. The regions were chosen for their cultural diversity and varying business contexts, allowing for the exploration of both universal challenges and culturally specific factors related to burnout.

This study aligns with the JD-R model and aims to provide insights into how mindfulness functions on both individual and organisational levels, influencing burnout prevention and overall wellbeing in in construction and engineering organisations. Although the sample size is adequate for qualitative research, the findings are primarily indicative and suggest the need for further research to delve into regional differences and refine strategies for promoting wellbeing in diverse settings.

Table 2 Interviewee details

The interviews were conducted in English and Mandarin via either face-to-face or through MS Teams, based on the participants' preferences and availability. They lasted 45-60 minutes. The research questions were guided by the literature review, and included questions on (a) their demographics (age, gender, education level, employment status, number of years of experience and the sector they work for); (b) their organisations' approach to employee wellbeing (in particular, the prevention targeting occupational stress and burnout); (c) the effectiveness of these practices; and (d) their views on the respective responsibilities of organisations versus individual employees. Specifically, to understand the participants' perception of burnout, its relationship to their respective organisation, the promotion of mindfulness techniques by the organisation, and personal adoption, their role as EW signals, and any perceived connection between the nature of their work and burnout, Perceptions are embraced in the analysis for it is these that help inform employee actions and behaviour and inform management interventions along with other more 'rational' considerations.

Inductive thematic analysis was employed to analyse the data, leveraging theoretical approaches that offered ample flexibility to elicit intricate accounts and organise the data effectively (Braun & Clarke, 2006). Interviews were recorded with participant consent, transcribed and coded manually. Manual coding was appropriate due to involved participants coming from different countries and languages, allowing some contextual interpretation for the abstraction of themes (Crowley et al., 2002). The analysis approach is presented in detail in Table 3.

The coding scheme underwent iterative updates during the coding process to maintain intercoder reliability. Following individual coding of a subset of transcripts, each coder communicated their decisions to the lead author, facilitating discussion and clarification of any discrepancies. This approach was implemented to minimise potential researcher bias (Azungah, 2018). The subthemes and themes derived from the coding process are presented in table 3.

Table 3 Thematic analysis process

Findings and results

Two major themes emerge from our findings which exhibit the employees' perception of burnout in construction and engineering organisations and the extent to which mindfulness can be effective as a job resource to address and prevent burnout. This section presents our findings under each theme.

Employee perception of burnout and its contributing factors

Causes of burnout

Burnout in construction and engineering stems from several interrelated factors, predominantly linked to job specifications, personal attributes, and home life conditions. Most participants identified unreasonable workload as a primary trigger, worsened by factors such as absenteeism, remote working, and lack of growth opportunities. Excessive workloads, particularly when tasks are unfamiliar, often lead to unhealthy working habits like long hours and skipping breaks. One participant described the challenge of juggling 4-5 projects simultaneously, working 40-60 hours weekly despite being paid for 40:

> "I can't remember the last time I wasn't working at night or on a weekend" (P23-EU).

Bullying, harassment, and gender disparities were mentioned by some, with additional burdens often placed on women due to non-work responsibilities. These issues amplify stress and increase the risk of burnout:

> "I have been so busy and exhausted, but there is no recognition. This is a breaking point." (P16-CN).

Personal resilience, experience, and career ambitions also play significant roles. New employees often lack confidence and psychological safety, making them more susceptible to burnout. Overambition can drive unhealthy performance orientations, leading to overwork. Misconceptions about expectations further exacerbate these risks. Family conditions also intersect with workplace stress, as personal challenges can amplify workplace pressures:

> "Personal difficulties acted as a catalyst for burnout, as I was already experiencing pressure at work." (P3-EU).

The inherently time-sensitive nature of project-based work adds to the strain. Deadlines, bid submissions, and the unpredictable workflow of construction projects create cycles of low and high activity, causing frequent context-switching and resource strain:

> "Sometimes you feel like you have nothing to do, but other times, you may have to work 24 hours a day." (P9-CN).

Collaboration across diverse teams and external stakeholders adds further complexity, requiring individuals to adjust to varying routines and demands:

> "You must meet new people, adjust your routine. Every team works differently, and this can trigger more stress." (P7-EU).

Extended time away from family, particularly in construction, is another stressor, with some employees spending months away from home. One participant reported being on business trips for 330 days in a single year. These cumulative factors reveal how systemic redesigns and robust support mechanisms are essential to address burnout effectively.

EW signs of burnout

The findings show that the EW signs of burnout fall into the intrapersonal and interpersonal. The intrapersonal category includes the symptoms recognised by the individual. A wide range of both physical and psychological signs were mentioned, including sleep pattern disturbance, loss of motivation and concentration, loss of appetite, dreading going to work, difficulty making decisions, constantly thinking of changing their job and seeking new opportunities, and feelings of not being appreciated or underappreciated at work.

> "In responsible roles you are making decisions all day and others expect you to get it right, so a good sign is becoming aware you can't make any more decisions" (P28-NA)

The interpersonal category includes the EW signs of burnout, which others sense in an individual that can be harnessed by any organisation. These included changes in behaviour and treatment of others at work as well as at home by close friends and family members. At the workplace, the signs noticed by co-workers and managers were changes in work patterns and behaviours, for example working at irregular times and long hours, decreased productivity, and sceptical or distrustful attitude towards the job and people around them.

> "I had lost interest in the tasks I was involved in, and I didn't want to work with the people in my team. Others noticed a change in my behaviour." (P1-EU)

Evidence was not forthcoming that the employing organisations were capturing and acting upon such EW signs, hence responsibility appeared to be reliant upon the individuals themselves.

Individuals' responsibility in addressing burnout

Participants emphasized the importance of self-awareness and recognizing the early signs of burnout. Being attuned to physical and emotional cues allows individuals to address stress proactively:

> "Being attuned to one's body helps them identify the early signs of burnout and take necessary steps to address the issue before it becomes too severe." (P5-EU)

Equally critical is the willingness to communicate concerns and set boundaries, as well as the confidence to say "no" when necessary:

> "We should also be confident and brave enough to set healthy boundaries and be comfortable with saying 'no' when necessary." (P4-EU)

Responsibility for managing stress lies with both individuals and organizations. While organisations must establish supportive policies, individuals need to utilize these resources, such as taking breaks, using flexible work arrangements, and prioritizing self-care:

> "The responsibility for stress and burnout should be on both sides as it is hard for the organisation to monitor whether employees 'get the downtime at home or do they have a stressful work environment and then they have a stressful home environment to go down to as well'." (P28-UK, P2-EU)

Self-care techniques, including physical activity, mindful eating, and taking time to recharge, were identified as key intrapersonal resources. Participants also stressed the importance of resilience, courage, and realistic goal setting, along with celebrating achievements to build stress-management capabilities. Religious faith was noted as another coping mechanism.

Interpersonal resources, such as support from family, friends, and coworkers, were highlighted as vital. Positive workplace relationships and group activities can provide a buffer against stress. Encouragement from others often helps individuals recognize burnout signs:

> "Those surrounding you can help you recognize the signs of burnout and provide support. Both my colleagues and my spouse noticed that I was irritated and 'not myself' and helped me recognize that something needs to change." (P3-EU)

Ultimately, personal efforts and organizational systems must work together to mitigate burnout effectively.

Mindfulness as a job resource for addressing employee burnout

Mindfulness as a sign for recognising signs of burnout

Participants reflected on mindfulness practices and their organizational support, revealing three perspectives: mindfulness as an effective burnout prevention tool, as a mechanism for early detection, and as ineffective. Many noted mindfulness helps individuals focus inward and identify early signs of burnout:

> "I started sensing that I cannot fully focus, and my mind keeps wandering during meditation. This to me was a sign that the pressure and stress from work was overtaking me." (P5-EU)

Others highlighted its ability to foster awareness of emotions and prompt precautionary measures:

> "Mindfulness can create awareness on the situation so that you can take precautionary measures." (P1-EU)

However, some participants observed drawbacks, particularly when organizations selectively implement mindfulness tools. Such practices might heighten awareness of unreasonable workloads without addressing systemic issues, potentially leading to dissatisfaction or attrition. Others emphasized the value of human connection over mindfulness for preventing burnout:

> "Maybe not so much mindfulness but bringing people together for them to share their experiences and see that other people are having the same challenges." (P21-EU)

Cultural resistance to mindfulness terminology was noted, particularly in traditionally male-dominated sectors like construction. Participants acknowledged the value of mindfulness-based activities (e.g., walks, sports, or social connections) but found the term "mindfulness" off-putting:

> "If they put the word mindfulness in front of me, I probably would have switched off after reading the word mindfulness." (P24-EU)

While larger organisations tend to integrate mindfulness into HR and wellbeing strategies, smaller companies lack such resources. Popular practices included meditation, physical activities (e.g., yoga, hiking), and apps like Headspace and Calm. Despite these benefits, participants agreed that mindfulness alone cannot address burnout's systemic causes, such as organizational culture, business models, or interpersonal dynamics. These underlying issues require comprehensive organizational reform.

Responsibility of organisations in facilitating mindfulness for addressing burnout

The participants' organisations implemented a range of resources to promote a healthy environment and supportive organisational culture. Strategic interventions included access to gym memberships, counselling, flexible working arrangements, and support for parents and carers. Informal initiatives featured social activities, celebrations, and team-building events. Wellbeing was further supported

through Employee Assistance Programs (EAPs), mental health services, wellness programmes, and awareness campaigns, communicated via bulletins, newsletters, webinars, and top management involvement.

However, monitoring of employee wellbeing, such as identifying early warning (EW) signs of burnout, was insufficient. Some organisations intervened only after employees had reached burnout, as illustrated by one participant: "My colleague hit burnout after a period of intensive work. The company then advised them to take a break (sick leave). It was too late!" (P7-EU). Participants from Europe and North America highlighted non-monetary initiatives, while Chinese participants emphasized bonuses and monetary rewards. One noted:

> "My salary, my economic reward system and other aspects are not that satisfying... this dissatisfaction actually leads to some job burnout" (P16-CN).

Most participants (30 out of 32) believed that organisations have a greater responsibility than individuals to prevent burnout. One remarked: "I think that the organisation believes that if an individual is struggling, that individual is responsible for coming forward and for flagging that they are struggling" (P20-EU). Many felt organisations lacked holistic approaches, with employee wellbeing often left to individual responsibility despite being an espoused value.

A supportive organisational culture, encouraged through open communication, formal reporting systems, and line management support, was seen as essential. Participants agreed that line managers play a key role in identifying signs of stress and offering support. However, if employees are overworked, wellness initiatives were deemed ineffective. Overall, culture and management were recognized as crucial in preventing burnout.

Cultural differences and priorities

In Europe and North America, there's a growing trend of organizations integrating mindfulness practices to support employee well-being. This includes offering mindfulness training, creating dedicated spaces for mindfulness activities, and encouraging practices like meditation and mindful breaks during the workday. These efforts which are aimed at reducing stress, improving focus, and enhancing overall job satisfaction, have been reflected in the interview results.

In contrast, Chinese organizations often emphasize achieving milestones and meeting deadlines, which can sometimes lead to less focus on employee well-being and higher risks of burnout. However, mindfulness is gaining traction in China as well, with increasing recognition of its benefits in various fields such as education, healthcare, and corporate settings. Some Chinese companies are beginning to incorporate mindfulness practices, but the overall adoption rate is still lower compared to Western counterparts.

> "I don't know whether I understand mindfulness properly. Pressure can't be avoided since the business have to survive among the fierce competition. If businesses are gone, it will be harder for employees to survive. Therefore, under this circumstance, there is no way to change it." (CN-10)

> "Everyone, in my opinion, everyone must find their own way to deal with stress. I don't think organisations can actually prioritise wellbeing over achieving milestones" (CN-2)

Discussion

While previous research has presented mindfulness as a valuable job resource for aiding employees in challenging situations, such as the COVID-19 setting (Xie et al., 2022), its potential in preventing and managing burnout remains largely unexplored in the project profession. Through this research, we respond to two calls in the literature: 1) investigating the effectiveness of mindfulness at individual level on improving employee wellbeing and mitigating burnout (Aránega et al., 2020), and 2) exploring mindfulness as a strategy for coping with stress and burnout in project-based work (Daniel et al., 2022; Pinto et al., 2014). To the best of our knowledge, this study represents one of the pioneering attempts to establish a connection between mindfulness and burnout prevention within a project context, particularly focusing upon EW signs of stress and burnout as an integral part of a systematic wellbeing strategy in a high-risk working environment.

Our aim was to explore the contribution of mindfulness to prevention and mitigation of burnout in construction and engineering organisations. Through the lens of JD-R theory (Proposition 1) (Bakker et al., 2023), the job demands in project environments are associated with higher psychological costs compared to many non-project occupations. This can lead to increased effort, which depletes employees' physical, emotional, and cognitive resources and can lead to exhaustion and other health issues (Proposition 2) (Bakker et al., 2023).

Mindfulness as a cognitive-behavioural technique, is increasingly being used by organisations to promote work engagement. The findings suggest these are mindful initiatives rather than strategic and systematic approaches in-house and are outsourced through a range of external providers in some organisations. Responsibility tends to still predominantly preside with individuals, especially regarding EW signs.

Individuals practicing mindfulness experienced enhanced well-being. The JD-R proposition that asserts job resources can amplify the mitigation of job demands and stress posits that individuals will benefit from organisational support and the evidence confirmed the appreciation of initiatives organisations undertake and support indirectly too. We add the following nuance to our findings. They show that job resources can only be useful when consistently employed and supported by the organisational business model, culture, balanced workloads, realistic expectations, and appropriate work-life balance policies. Furthermore, job resources and particular wellbeing initiatives proved particularly beneficial for

employees with elevated personal resources, such as optimism and resilience (Proposition 4) (Bakker et al., 2023).

Our findings suggest that while mindfulness alone isn't a comprehensive solution for addressing burnout causes. Individuals recognised that, when signalled through and acted upon by organisations, mindfulness can serve as a valuable technique for mitigation to support emotional wellbeing, coping within business model demands and specific job requirements. Mindfulness provides practitioners with the opportunity to prioritise self-care, recognise the root causes and early signs of potential burnout, and take timely preventive measures to address it. This is in line with proposition of JD-R theory referring to the cycle of high job strain, such as difficulties concentrating and making mistakes and new job demands (Proposition 9) (Bakker et al., 2023).

These finding highlights mindfulness as a (potential) tool to detect EW signs of burnout, prompting preventive actions to avoid associated costs like reduced productivity, increased absenteeism, and higher healthcare expenses for both individuals and organisations. Although individuals recognised that the signals were available, we found no evidence to support that organisations had a strategic approach or a systematic set of processes to capture EW signs. This helps explain the repeated comments that individuals perceived organisations had more, and indeed the greater, responsibility towards having strategic approaches towards wellbeing and adopting mindfulness in systematic ways. Overall, our findings show that while individual mindfulness is an effective personal resource for addressing burnout, it is clear that this can not be fully effective without having organisational mindfulness in place which includes being alert to weak signals and to base behaviour and decisions on evidence and facts, and at the same time being able to resiliently recover from mishaps and change of direction (Oeij et al., 2022). Our study suggests that that organisational mindfulness alongside individual mindfulness enables resilient team behaviour in solving critical incidents, positively contributes to wellbeing of employees, and thus achieving better project results (Figure 1).

Figure 1 Mindfulness in construction and engineering and JD-R theory

We argue that addressing burnout is a shared responsibility across all organisational levels. Senior management, line managers, and peers must all contribute to burnout prevention. The research highlights that a project-centric approach alone, which focuses only on project-level factors, is insufficient to address burnout effectively. Instead, a multi-dimensional approach is necessary—this includes clearly defined roles and expectations at the project level, wellbeing initiatives at the organisation level, and a supportive culture where individuals feel secure to express concerns. While individual responsibility is crucial, mindfulness alone cannot compensate for a lack of comprehensive organisational strategies or adequate resources.

The findings also reveal that existing organisational wellbeing initiatives, although well-intentioned, are often fragmented and tactical, failing to address burnout comprehensively. Despite mindfulness

being a valuable self-care tool, it cannot substitute for systemic issues like poor business models, inadequate workloads, or ineffective organisational cultures. Thus, construction and engineering organisations should incorporate ongoing mindfulness practices into a strategic, systematic approach to wellbeing.

Regional differences in attitudes toward burnout prevention also emerged, warranting further investigation. Chinese respondents emphasized the importance of financial rewards, suggesting that these rewards might psychologically delay feelings of stress and burnout. In contrast, European respondents focused on the quality of the work environment and expressed a shared belief in the need for more support from organisations. North American participants noted improvements in wellbeing activities, such as the use of health apps and training initiatives. However, there was concern that individuals might not take enough personal responsibility for their wellbeing. Despite these regional differences, there was a consensus across all three regions on the importance of organisational support in preventing burnout.

Cultural differences were evident in the forms of support preferred by employees. For instance, Chinese participants highlighted financial rewards, which align with cultural values around performance and compensation. In Europe and North America, non-monetary initiatives like wellness programmes were more emphasized. According to the JD-R model, an imbalance between job demands and available resources contributes to stress and burnout. Financial rewards were viewed to address this imbalance in project-based work, which often involves high demands and unpredictable conditions.

In the UK and Europe, respondents stressed the impact of organisational culture on project dynamics, particularly regarding the lack of open conversations about workload with line managers. This situation leads to emotional exhaustion and ultimately burnout. In contrast, North American participants noted positive changes in wellbeing initiatives, including a focus on training and family-oriented wellbeing programs. However, they also observed that individuals might not always embrace the responsibility for their own wellbeing.

Despite these regional variations, a common theme emerged across all regions: burnout is driven by similar triggers, such as job demands and project-related stress. Participants emphasized the importance of recognising EW signs of burnout through both personal awareness and interpersonal interactions. They identified factors like the social work environment, role characteristics, and individual psychological skills as crucial to overall wellbeing. Although mindfulness alone cannot prevent burnout, fostering a mindful space within organisations allows individuals to proactively identify and address burnout, enhancing overall wellbeing. The study concludes that a comprehensive, multi-level approach—combining individual mindfulness practices with organisational support—is essential for effectively mitigating burnout.

This research suggests that construction and engineering organisations and managers, especially line managers, can play a crucial role in helping employees manage work stress by promoting cognitive-behavioural techniques like mindfulness. However, it underscores the importance of recognising

shared responsibility across all levels of the organisation to ensure employee wellbeing and effectively prevent burnout. The study identifies several key factors that contribute to a positive work environment within organisations including:

- Establishing clear expectations for employees, especially those with less experience,
- Cultivating a supportive culture by acknowledging employees' contributions to each project and the organisation,
- Offering well-defined career progression guidelines and promoting a healthy work-life balance.

Despite these measures, the primary challenge in addressing stress and burnout is the failure to capture early warning (EW) data and the lack of systematic approaches to challenge existing business models. The 2021 Global Workplace Burnout Study highlights that wellness initiatives alone are insufficient to address the root causes of chronic workplace stress. Immediate, individual-focused solutions offer limited long-term prevention for burnout. This points to a pressing need for structural and cultural transformations in business operations to effectively manage burnout.

Construction organisations must bridge the gap between high-level policies and individual experiences within the organisational hierarchy. Developing integrated strategies that include mindfulness alongside other interventions and providing employees with a comprehensive toolkit to manage stress, is essential for addressing burnout. While mindfulness can be a valuable resource, it should not be a standalone solution; organisations need to foster an environment where systemic changes, including better recognition of employee wellbeing, can thrive.

Conclusions and future research

This research enhances understanding of mindfulness as a job resource for mitigating burnout in construction and engineering Organisations. It highlights how individual factors, workload, task-related aspects, line managers, team members, organisational culture, and business models contribute to burnout, though the combined effects of these factors remain under-explored. Mindfulness is recognized as a tool for identifying early warning (EW) signs of burnout, but its long-term effectiveness needs further investigation. While the study’s limited interview sample poses a constraint, it opens opportunities for deeper exploration, particularly regarding cultural differences in mindfulness adoption. Future research could examine how mindfulness is normatively integrated into organisations and its alignment with business models. The study also raises an important question: if mindfulness improves coping abilities, could the resulting commercial pressures in business models intensify, potentially escalating demands on employees unless business models are reevaluated?

References

Abenavoli, R.M., Jennings, J.A., Greenberg, M.T., Harris, A.R. and Katz, D.A. (2013) The protective effects of mindfulness against burnout among educators, The Psychology of Education Review 37(2): 57-69.

Aránega, A.Y., Del Val Núñez, M.T and Sánchez, R.C. (2020) Mindfulness as an intrapreneurship tool for improving the working environment and self-awareness, Journal of Business Research 115 (2020): 186–193.

Azungah, T. (2018) Qualitative research: deductive and inductive approaches to data analysis, Qualitative Research Journal, 18 (4): 383-400.

Bakker, A.B., Demerouti, E., Sanz-Vergel AI. (2014). Burnout and work engagement: the JD-R approach. Annual Review of Organisational Psychology and Organisational Behavior 1:389–411.

Bakker A.B., Demerouti E. (2017). Job Demands–Resources theory: taking stock and looking forward. Journal of Occupational Health Psychology 22:273–85.

Bakker, A.B., Demerouti, E. and Sanz-Vergel, A. (2023) Job Demands–Resources Theory: Ten Years Later. Annual Review of Organisational Psychology and Organisational Behavior 10:25–53.

Black, L.J. and Repenning, N.P. (2001) Why firefighting is never enough: preserving high-quality product development, System Dynamics Review 17(1): 33-62.

Braun, V. and Clarke, V. (2006). Using Thematic Analysis in Psychology. Qualitative Research in Psychology, 3(2):77–101.

Brown, K.W. and Ryan, R.M. (2003) The benefits of being present: Mindfulness and its role in psychological well-being, Journal of Personality and Social Psychology, 84(4): 822–848.

Burton, A., Burgess, C., Dean, S., Koutsopoulou, G.Z. and Hugh-Jones, S. (2017) How effective are mindfulness-based interventions for reducing stress among healthcare professionals? A systematic review and meta-analysis, Stress and Health 33 (1):3-13.

Chullen, C.L. (2014) The mediating effects of role stressors in supervisor-to-subordinate burnout, Problems and Perspectives in Management 12(4):91-102.

Cicmil, S., Lindgren, M. and Packendorff, J. (2016) The project (management) discourse and its consequences: On vulnerability and unsustainability in project-based work. New Technology, Work and Employment, 31(1): 58-76.

Cohen-Katz, J., Wiley, S.D., Capuano, T., Baker, D.M. and Shapiro, S (2004) The effects of mindfulness-based stress reduction on nurse stress and burnout: a quantitative and qualitative study, Holistic Nursing Practice, 18(6):302-308.

Crowley, C., Harre, R., & Tagg, C. (2002). Qualitative Research and Computing: Methodological Issues and Practices in Using QSR NVivo and NUD*IST. International Journal of Social Research Methodology, 5(3):193–197.

Daniel, C., Daniel, P. and Smyth, H.J. (2022) The role of mindfulness in the management of projects: potential opportunities and threats in research and practice, International Journal of Project Management 40(7), 849 - 864.

Demerouti, E., and Bakker, A.B. (2011) The Job Demands–Resources model: Challenges for future research. SA Journal of Industrial Psychology 37(2): Art #974, 9 pages.

Edú-Valsania, S., Laguia, A. and Moriano, J.A. (2022) Burnout: A Review of Theory and Measurement, Int. J. Environ. Res. Public Health 2022 (19): 1780.

Freudenberger, H. J. (1974) Staff burnout, Journal of Social Issues 30 (1): 159–165.

Goodman, M.J. and Schorling, J.B. (2012) A Mindfulness Course Decreases Burnout and Improves Well-being Among Healthcare Providers, International Journal of Psychiatry in Medicine, 43(2): 119-128.

Gumusburun Ayalp, G. (2022). Critical predictors of burnout among civil engineers at construction sites: a structural equation modelling, Engineering, Construction and Architectural Management, 29(9): 3547-3573.

Hackman JR, Oldham GR. (1976). Motivation through the design of work: test of a theory. Organizational Behavior and Human Decision Processes 16:250–79.

Hafenbrack, A.C. (2017) Mindfulness Meditation as an On-The-Spot Workplace Intervention, Journal of Business Research 75 (2017): 118–129.

Hales, D.N. and Chakravorty, S.S. (2016) Creating high reliability organisations using mindfulness, Journal of Business Research 69(2016): 2873-2881.

Herzberg F.I. (1966) Work and the Nature of Man. Cleveland, OH: World.

Hobfoll S.E., Halbesleben, J., Neveu, J-P., Westman, M. (2018) Conservation of resources in the organizational context: the reality of resources and their consequences, Annual Review of Organizational Psychology and Organizational Behavior 5:103–28.

Hugh-Jones, S., Rose, S., Koutsopoulou and Simms-Ellis, R. (2018) How is stress reduced by a workplace mindfulness intervention? A qualitative study conceptualising experiences of change, Mindfulness 2018(9): 474-487.

Kang, M., Selzer, R., Gibbs, H., Bourke, K., Hudaib, A., and Gibbs, J. (2019) Mindfulness-based intervention to reduce burnout and psychological distress and improve well-being in psychiatry trainees: a pilot study, Australasian Psychiatry 27(3): 219-224.

Karasek R.A. (1979) Job demands, job decision latitude, and mental strain: implications for job redesign, Administrative Science Quarterly 24:285–308.

Kiburz, K. M., Allen, T. D. and French, K. A. (2017) Work–family conflict and mindfulness: Investigating the effectiveness of a brief training intervention, Journal of Organisational Behavior 38: 1016–1037.

Kohls, N., Sauer, S. and Walach, H. (2009) Facets of mindfulness – Results of an online study investigating the Freiburg mindfulness inventory, Personality and Individual Differences 46 (2009): 224–230.

Korunka, C., Tement, S., Zdrehus, C. and Borza, A. (2010) BOIT - Burnout Intervention Training for Managers and Team Leaders, European Commission's Leonardo da Vinci program.

Lee, W., Migliaccio, G.C., Lin, K. and Seto, E.Y.W. (2020) Workforce development: understanding task-level job demands-resources, burnout, and performance in unskilled construction workers, Safety Science 123 (2020) 104577.

Leung, M., Chan, Y. and Olomolaiye, P. (2008) Impact of Stress on the Performance of Construction Project Managers, Journal of Construction Engineering and Management 134(8): 644-652.

Leung, M.-Y., Ahmed, K. and Famakin, I.O. (2024) Impact of mindfulness-based stress reduction intervention on the performance of construction professionals, Engineering, Construction and Architectural Management, 31(2): 662-680.

Liang, Q and Leung, M-Y (2015) Analysis of the relationships between mindfulness and stress for construction professionals in: Raidén, A B and Aboagye-Nimo, E (Eds) Proceedings 31st Annual ARCOM Conference, 7-9 September 2015, Lincoln, UK, Association of Researchers in Construction Management, 469-478.

Lingard, H. and Francis, V. (2006) Does a supportive work environment moderate the relationship between work-family conflict and burnout among construction professionals? Construction Management and Economics 24(2): 185-196.

Lingard, H. and Taylor, M. (2022) Making time for life: A whole-of-industry initiative to reducing work hours and promoting health and gender inclusion in project-based construction work, Project Leadership and Society 3(22): 100065.

Lingard, H., Brown, K., Bradley, L., Bailey, C. and Townsend, K. (2007) Improving employees' work-life balance in the construction industry: Project alliance case study, Journal of Construction Engineering and Management 133(10): 807-815

Lomas, T., Medina, J.C., Ivtzan, I., Rupprecht, S., Hart, R. and Eiroa-Orosa, F. (2017) The impact of mindfulness on well-being and performance in the workplace: an inclusive systematic review of the empirical literature, European Journal of Work and Organisational Psychology, 26(4): 492-513

Luken, M. and Sammons, A. (2016) Systematic Review of Mindfulness Practice for Reducing Job Burnout, The American Journal of Occupational Therapy 70(2): 7002250020p1- 7002250020p10.

Makara-Studzińska M., Załuski M., Jagielski P., Wójcik-Małek D. and Szelepajło M. (2021) An exploration of perceived stress, burnout syndrome, and self-efficacy in a group of Polish air traffic controllers and maritime navigators: Similarities and differences, International Journal of Environmental Research and Public Health, 18, 53.

Maslach, C. and Jackson, S.E. (1981) The measurement of experienced burnout, Journal of Occupational Behaviour 2 (2): 99–113.

Maslach, C. and Leiter, M.P. (2008) Early Predictors of Job Burnout and Engagement, Journal of Applied Psychology 93(3): 498–512.

Michel, A., Bosch, C. and Rexroth, M. (2014) Mindfulness as a cognitive-emotional segmentation strategy: An intervention promoting work-life balance, Journal of Occupational and Organisational Psychology 87: 733-754.

Mubarak, N., Khan, J. and Khan, A.K. (2022) Psychological distress and project success: The moderating role of employees' resilience and mindfulness, International Journal of Project Management, 40(2022): 566-576.

Otto, M.C.B., Van Ruysseveldt, J., Hoefsmit, N., Van Dam, K. (2020) The development of a proactive burnout prevention inventory: How employees can contribute to reduce burnout risks, International Journal of Environmental Research and Public Health 17(5): 1711

Patanakul, P., Pinto, J.K. and Pinto, M.B. (2016) Motivation to perform in a multiple-project environment: The impact of autonomy, support, goal clarity, and opportunities for learning, Journal of Engineering and Technology Management 39(2016): 65-80.

Peticcia-Harris, A., Weststar, J. and McKenna, S. (2015) The perils of project-based work: Attempting resistance to extreme work practices in video game development, Organisation 22(4): 570-587.

Pinto, J., Dawood, S. and Pinto, M.B. (2014) Project management and burnout: Implications of the Demand–Control–Support model on project-based work, International Journal of Project Management 32(4): 578-589.

Schaufeli, W. B. and Enzman, D. (1998). The burnout companion to study & practice. London: Taylor & Francis.

Siegrist, J. (1996) Adverse health effects of high-effort/low-reward conditions, Journal of Occupational Health Psychology 1:27–41.

Sun, M., Zhu, F. and Sun, X. (2020), Influencing factors of construction professionals' burnout in China: a sequential mixed-method approach, Engineering, Construction and Architectural Management, 27(10): 3215-3233.

Taylor, N.Z. and Millear, P.M.R. (2016) The contribution of mindfulness to predicting burnout in the workplace, Personality and Individual Differences 89: 123-128.

Turner, J. R., Huemann, M., & Keegan, A. E (2008). Human resource management in the project-oriented organisation: Employee well-being and ethical treatment. International Journal of Project Management, 26(5): 577-585.

Van Gordon, W., Shonin, E., Zangeneh, M. and Griffiths, M.D. (2014) Can mindfulness really improve work-related mental health and job performance? International Journal of Mental Health and Addiction 12: 129-137.

Wu, Z., Wang, Y., and Liu, M. (2023). Job stress and burnout among construction professionals: The moderating role of online emotions. Engineering, Construction and Architectural Management, Vol. ahead-of-print No. ahead-of-print.

Xie, J., Ifie, K. and Gruber, T. (2022) The dual threat of COVID-19 to health and job security- Exploring the role of mindfulness in sustaining frontline employee-related outcomes. Journal of Business Research 146(2022): 216-227.

Yip, B. and Rowlinson, S. (2009) Job Burnout among Construction Engineers Working within Consulting and Contracting Organisations, Journal of Management in Engineering 25(3): 122-130.

Zhang, L., Yao, Y. and Yiu, T.W. (2020) Job Burnout of Construction Project Managers: Exploring the Consequences of Regulating Emotions in Workplace, Journal of Construction Engineering and Management 146(10): 04020117.