ARTICLE

CURRENT APPROACHES TO STRESS MANAGEMENT IN THE CZECH BUSINESS ENVIRONMENT

Soukupová, N., Kocourková, M., Drahotová, K.

Nikola Soukupová / University of South Bohemia in České Budějovice, Faculty of Economics, Department of Management, Branišovská 1645/31a, 37005 České Budějovice, Czech Republic. Email: nsoukupova@ef.jcu.cz

Markéta Kocourková / University of South Bohemia in České Budějovice, Faculty of Economics, Department of Management, Branišovská 1645/31a, 37005 České Budějovice, Czech Republic. Email: kocourkovam@ef.jcu.cz (corresponding author)

Kateřina Drahotová / Czech University of Life Sciences Prague, Faculty of Economics and Management, Department of Management and Marketing, Kamýcká 129, 165 21 Praha 6, Czech Republic Czech Republic. Email: drahotovak@pef.czu.cz

Abstract

This paper investigates stress management practices in Czech small and medium-sized enterprises (n = 194) within the manufacturing sector, with the primary objective of assessing the extent to which these enterprises integrate stress management principles into their internal management processes. The study places a particular emphasis on how these enterprises implement stress management, encompassing both organizational and individual level interventions, while also scrutinizing perceived work stressors, including challenges arising from workplace digitization. A questionnaire was compiled by making use of theoretical insights and empirical findings within stress management, assessing stress management strategies and exploring work-related stress costs. Additionally, it incorporated queries to delineate organizational profiles, enriching the understanding of contextual nuances. Based on a questionnaire survey conducted in the Czech Republic, the research reveals that 86.6% of the surveyed enterprises have implemented at least one stress management intervention, predominantly at the organizational level (45.4% of the respondents). Furthermore, 38.7% of the enterprises adopt both organizational and individual-level interventions, with only 2.6% exclusively focusing on individual stress management interventions. In a broader European context, the Czech Republic appears to lag behind in managing psychosocial risks and workplace stress, characterized by the lowest percentage of stress management action plans and a low rate of actual implementation of stress management measures. Additionally, there is a notable lack of legal frameworks addressing the issue. These findings underscore the need for more effective strategies to enhance stress management in the workplace and the overall wellbeing of employees.

Implications for Central European audience: Given the common economic challenges facing Central European countries, the findings presented in this article are of fundamental importance for the whole region. Workplace stress and its effective management are a

common problem and therefore, the findings of this study are relevant. Given the global trend towards digitization of workplaces, these findings have potential applicability across Central Europe. Enterprises operating in our region should take due note of these emerging stressors and develop tailored strategies to address them and potentially improve the overall quality of working life for employees across the region.

Keywords: Workplace; work-related stress; stress management
JEL Classification: D21, M14

Introduction

The issue of stress in the workplace has become a critical concern for businesses worldwide, with significant implications for employee health and organizational productivity. Stress is increasingly recognized as a major contributor to poor health in work environments, a fact underscored by alarming statistics from international reports. For instance, the *Health and Safety Executive* highlighted that, during the period 2021-2022, over 17 million working days were lost in response to 914,000 cases of work-related stress, depression or anxiety (HSE, 2022). This staggering loss not only reflects the profound personal toll on employees but also emphasizes the urgent need for effective stress management strategies within the corporate sector. In the context of Czech companies, understanding the prevalence and impact of workplace stress is crucial for developing and implementing interventions that can sustain the health and wellbeing of the workforce.

Work stress and its management are usually examined from the employee's perspective, focusing on their subjective perception of stress, the impact on satisfaction and performance and analysis of stressors and self-management methods (e.g., Havlovic & Keenan, 2020; Holton et al., 2016; Libin, 2017). However, less attention has been paid to stress management from the perspective of the enterprise itself, especially small and medium-sized enterprises (SMEs), which often lack the financial resources and knowledge to manage human resources effectively (Molek-Winiarska, 2016; Pavlista et al., 2021; Kelloway & Cooper, 2011). As also pointed out by Garavan et al. (2016), SMEs are often characterized by a limited number of employees who occupy many roles with diverse tasks; moreover, sources of stress may be more difficult to identify and address in an SME environment due to the close and often informal nature of working relationships. This can lead to a lack of recognition and resolution of work stressors, further increasing the need for effective stress management strategies. These realities can increase employees' exposure to work stress, including factors such as work overload, job insecurity, the absence of unions, and informal mechanisms for negotiation and dispute resolution (Burgess, 1992; Martin, 2021; Villanueva & Djurkovic, 2009).

As early as 1989, the European Union stressed the need to manage psychosocial risks in the workplace through prevention, information and training (89/391/EEC, European Council, 1989). This document introduced Europe's first systematic legislative approach to work stress, promoting best practices and corporate social responsibility (CSR). The importance of this legislative step was reflected in the strengthening of companies' commitment to the health and safety of their employees, which included the development and implementation of

strategies for the management of psychosocial risks. As a result, the work environment in Europe has gradually begun to adapt to a holistic approach to employee wellbeing, which encompasses not only the physical but also the mental and emotional aspects of working life. This trend underlines the importance of integrating psychosocial health into company culture and policies, which is critical to building sustainable and healthy work environments. It is therefore clear that a comprehensive strategy, supported by well-informed legislation and effective labour inspection, is the optimal action plan at the national level to achieve future success in this area (Sivris & Leka, 2015).

Psychosocial risks in the workplace harm the health and performance of workers and the workplace itself, reduce work productivity and increase employee turnover (Tarafdar et al., 2010; Steptoe & Kivimäki, 2013; Sari et al., 2021). However, in corporate practice, there is a view that job stress acts as a healthy motivational factor that leads to improved employee performance. However, it is essential to distinguish between constructive stress and harmful stress. As Jacobs et al. (2018) pointed out, workplace pressure can be a motivating factor for improved performance and is often necessary. A form of stress known as eustress can have positive and motivational effects and is characterized as a positive perception of challenges that can promote personal growth and development (Tarafdar et al., 2017). Although eustress can be beneficial, transforming this pressure into excessive stress, referred to as distress, can negatively affect both employees and employers. Therefore, stress management issues must be integrated into corporate governance, including developing strategies and programmes aimed at identifying, preventing and addressing stress in the workplace.

Managing stress requires the implementation of interventions at the individual and organizational levels, focusing on process change and employee support (Riva & Chinyio, 2018; Holman et al., 2018). However, it is essential to consider each organization's specific needs and context when designing and implementing stress management interventions. Interventions at the individual level aim to help employees gain the knowledge and skills to recognize, manage and reduce work stress. Interventions at the organizational level involve systematic changes to work processes aimed at the entire organization (Holman et al., 2018). Thus, research in this area must improve stress awareness and management, remove stigma and improve working conditions. Emphasis should also be placed on continuous evaluation and adaptation of these measures to align with the dynamically changing work environment and employee needs.

Stress management within the corporate environment has garnered substantial attention due to its significant impact on both individual performance and overall organizational health. In the Czech Republic, where small and medium-sized enterprises (SMEs) form the backbone of the economy, the ability to manage stress effectively is critical. These enterprises often operate with limited resources compared to larger corporations, which may affect their capacity to implement comprehensive stress management programmes. This disparity highlights the need for research into the specific stress management approaches adopted by Czech SMEs, as well as the effectiveness of these strategies in mitigating work-related stress and enhancing employee wellbeing.

The article is divided into several main parts. The Literature Review section presents the theoretical framework of the issue under study, focusing on the definition of work stress and types of interventions for its management. This section also identifies key work stressors, including those that may arise in the context of Industry 4.0 and related digitization. The ethical dimension of corporate responsibility in the area of work stress is also a vital aspect explored in this section. The Methodology section describes the research design and the research sample, the formulation of the research questions and the hypotheses derived from them. The testing of these hypotheses and the presentation of further results are then described in detail and discussed in the broader context in the Results and Discussion section. The final section, Conclusion, focuses on interpreting the findings and offers conclusions and recommendations for businesses seeking to integrate stress management principles into their internal processes.

1 Literature Review

1.1 Theoretical framework

The EU's 2021-2027 strategic framework for health and safety at work emphasizes prevention, change and preparedness, aiming to anticipate psychosocial risks and prioritize areas such as digitization, green jobs and work-related stress (WRS) (COM/2021/323, 2021). The costs of WRS in the EU are estimated to be in the billions annually and are rising. Stress is a major factor in workplace health issues; as shown by the Health and Safety Executive's report, stress ranks as a major contributor to poor health in work environments – in 2021-2022, it proved 1.8 million work-related ill health cases, 123 workers killed in work-related accidents and work-related injuries worth 7.6 billion EUR (HSE, 2023).

The concept of work-related stress began to take shape in the 1970s and 1980s (Kivimäki & Kawachi, 2015). Hassard et al. (2018) and Kortum et al. (2010) highlighted WRS as a significant occupational risk factor in today's global society. Although there is no universal agreement on its precise definition (Monteiro et al., 2015), WRS can be essentially described as the disparity between job demands and the employee's capacity to meet them. According to the definition provided by the World Health Organization (2020), responses to work demands and pressures are characterized as a mismatch between employee knowledge and skills. Conversely, Harshana (2018) described these responses as unwanted reactions by employees to excessive pressures or demands in the work environment. Salami (2010) presented the experience of tension, anxiety, frustration, anger and depression by employees from aspects of work. The European Commission (2000) defined these reactions as emotional, cognitive, behavioural and psychological responses by employees to aversive aspects of work, the work environment and the work organization. According to Kundaragi and Kadakol (2015), WRS can arise from organizational factors, personal traits and work-family interactions. This paper primarily examines prevalent work-related stressors, drawing upon various work stress models such as the person-environment fit model (French et al., 1974), the transactional model (Lazarus, 1966), the job-demand-control model by Karásek (1979), etc.

The impacts of work-related stress manifest in both employees and employers. WRS affects employee behaviour (Swaminathan & Rajkumar, 2013), such as attitudes to job and performance (Virtanen et al., 2009), employee commitment (Viljoen & Rothmann, 2009),

maladaptive coping with stress such as smoking and alcohol consumption (Kouvonen et al., 2008) physical effects such as coronary heart disease and stroke (Kivimäki & Kawachi, 2015), and last but not least, poor mental health (Stansfeld & Candy, 2006). Ongori and Agolla (2008), Molek-Winiarska (2016) and Jacobs et al. (2018) identified the effects of work stress on an organization, including its influence on productivity and effectivity, high accident rate, absenteeism, employee commitment, reduced quality of production, presenteeism, conflicts, increasing turnover rate, etc. (Baheshtifar & Nazarian, 2013; Ongori & Agolla, 2008). These aspects are further elaborated in Palmer's model, which presents the most common sources of stress in the workplace (see Palmer, 2001).

Stressors as a source of stress refer to work environment factors that can lead to stress reactions and influence the person's wellbeing (Ganster & Rosen, 2013). The list of job stressors would be infinite; new stressors keep appearing just as the destructive effect of old ones on employees dwindles. The initially uniform nature of the workforce is expected to fragment, leading to a blend of dependent work and entrepreneurship. Organizational structures are anticipated to evolve, becoming more temporally and spatially flexible in response to new technological advancements. The rise of robotics and artificial intelligence is likely to affect job security. The swift growth of technologies such as sensors, biotechnology, nanotechnology, AI and extended reality has been notable in recent decades and is predicted to continue. While technology boosts work efficiency and productivity, it also generates stress for employees, termed technostress. Initially defined in the 1980s by Brod (1984), technostress has become increasingly significant in the era of cyber-hybrid workplaces and AI expansion, followed by more pressure on employees and their mental wellbeing discomfort. Grummeck-Braamt et al. (2021) highlighted the growing importance of technostress due to the implementation of Industry 4.0. Some researchers even classify technostress as an illness (Champion, 1988). The impacts of adopting technological changes in organizations encompass work overload, job insecurity, increased work complexity, intrusion into personal life, uncertainty, role ambiguity and excessive digital dependency (Malik et al., 2021).

According to Panigrahi (2016), the causes of work stress can be divided into two main categories based on the origin of their sources: internal (individuals' perception and expectations) and external causes (workplace factors). Traditional work stressors include time pressure, repetitive work, job demands, coworker support, monotonous work, work overload, work complexity, interruptions, lack of influence, role conflict and ambiguity, incivility, violence, harassment and abusive supervision, job dissatisfaction, work relationships, inappropriate management styles, poor working conditions, fear of job loss, lack of opportunity for career growth, etc. (Akkoç et al., 2021; Bamber, 2011; Burman & Goswami, 2018; Lazarus & Folkman, 1984; Lang et al., 2012).

1.2 Assessment of stress management interventions

Every $1 invested in saving more than $3 for health care costs (Goh et al., 2015) proves the necessity and effectiveness of prevention interventions. Even in 2007, the total costs of stress, anxiety and depression among British employers equalled €1,220 per employee per year (Sainsbury Centre for Mental Health, 2007). Russo et al. (2021) calculated that absence

associated with work-related stress might cost €445,000 annually. Research applied in Europe (OSH Pulse, 2022) indicates that 27% of workers experience stress, anxiety or depression caused or exacerbated by work. Stress is therefore an unquestionable threat in economic, ethical and organizational terms.

According to Giga et al. (2003), organizations implement a variety of programmes/strategies to manage stress in the workplace at different levels. We can identify primary, secondary and tertiary interventions (Tetrick & Quick, 2011). A list of stress management interventions (SMI) is available in Tetrick and Winslow (2015). Primary interventions deal with work stressors, while secondary interventions try to eliminate stress reactions. Tertiary interventions should mitigate the effects of stress on individuals (Tetrick & Winslow, 2015; Tetrick & Quick, 2011). Dewe et al. (2012) added that the purpose of SMI is to eliminate primary sources of stress or strain on employees. Nielsen et al. (2010) emphasized that stress management can only be effective if it involves both the individual and organizational levels, taking into account the needs of employees and the organization. According to Molek-Winiarska (2016), primary interventions are achieved through organizational-level interventions (OLI), while secondary and tertiary interventions are achieved through individual-level interventions (ILI). Another view of stress management interventions is the IGLOO model, which enriches intervention levels with group, leader and social context (Nielsen et al., 2018). The OLI and ILI concepts change the organizational interface limits (De Frank & Cooper, 1987): organizational level, individual level and individual/organizational level. It is closer to the IGLOO model than the division of SMI into primary, secondary and tertiary. It combines both theoretical approaches.

OLI incorporate systematic alterations to administrative procedures targeting the entirety of the organization (Holman et al., 2018). Typical interventions are job redesign, economics, workload reduction, organization of work, physical load, setting strategies and goals, reduced time pressure, growth opportunities and sufficient organizational units (Holman et al., 2018; La Montagne et al., 2007; Nielsen et al., 2020; Li, 2020).

ILI are shaped by various factors involving cognitive, emotional and behavioural reactions associated with work (Nielsen et al., 2020). They improve employees' knowledge or ability to cope with stress, including training programmes, wellness activities, development programmes such as counselling, meditation and even medical interventions (Holman et al., 2018; La Montagne et al., 2007; Nielsen et al., 2020; Li, 2020).

2 Methodology

This study delves into the current practices of work stress management in the SME manufacturing sector. The primary objective is to investigate the extent to which these companies integrate stress management principles into their internal management processes. This includes identifying the predominant types of interventions employed, understanding which stressors are perceived as most critical by these enterprises and examining whether companies acknowledge stress management in the workplace as part of their organizational responsibility.

Additionally, the research encompasses the formulation of practical recommendations for companies interested in effectively integrating stress management principles into their management strategies. These recommendations aim to provide actionable guidance that can assist SMEs in navigating the complexities of workplace stress, tailoring interventions to

their specific needs and contexts, and ultimately enhancing the wellbeing and productivity of their workforce.

By examining these various facets of work stress management, the study contributes valuable insights into the effectiveness of current practices and offers a roadmap for SMEs in the manufacturing sector to improve their approach to managing employee stress in a rapidly evolving industrial landscape.

2.1 Research questions and hypotheses

The primary objectives of this study are to explore the following research questions:

RQ1: Do companies implement stress management principles or interventions? What type of interventions prevail?

RQ2: Who should take responsibility for stress management in the workplace? Is it primarily the responsibility of the company or the employee?

RQ3: What are the main stressors in enterprises according to their management? Does Industry 4.0 represent a significant stressor in the workplace?

Hypotheses were formulated in response to the research questions specified above. Each hypothesis was formulated concerning the current state of knowledge within the area under study and was subsequently subjected to empirical testing.

H1: Companies prefer to implement interventions at the individual level (ILI) as opposed to interventions at the organizational level (OLI).

H1 derivation: In companies, individual-level stress management interventions (ILI) are often preferred over organizational-level interventions (OLI), as OLI usually entail more time and money. This trend may also be due to the flexibility and ease of implementation of ILI, which are less dependent on structural and systemic organizational changes (e.g., Kinnunen-Amoroso and Liira, 2014; Martin et al., 2016).

H2: Companies that consider stress management their responsibility often introduce appropriate strategies into their management processes.

H2 derivation: In the corporate environment, the view of work stress, traditionally perceived as an inevitable accompaniment of responsible work, is changing. This view, criticizing employees as unable to manage stress independently, is being replaced by new approaches to stress management. Corporate leaders recognizing their social responsibility incorporate stress management principles into their strategies (e.g., Mihalits et al., 2023; Prasetyaningtyas et al., 2022).

H3: Within companies, Industry 4.0 appears to be a significant source of stress, leading to management support for stress management interventions.

H3 derivation: The fundamental transformation of the working environment resulting from the fourth industrial revolution and the associated digitization poses an increased risk of stressful situations for employees on a social level. This risk may be manifested, for example, in fears

of possible job loss, the need for retraining, or the increased need to use modern technologies (e.g., Berglund et al., 2021; Malik et al., 2021; Pfaffinger et al., 2023).

2.2 Research design and sample

The research design was carefully crafted to capture a comprehensive view of stress management practices among SMEs in the manufacturing sector. The empirical phase of the study took place in 2021 and 2022. The subjects of the study were small and medium-sized manufacturing companies in the Czech Republic. Respondents were selected to ensure that the perspectives captured in the study were those of key decision-makers within the SMEs. Owners and directors were chosen as they typically bear the responsibility for labour relations and overall organizational strategy, including stress management policies. The decision to have one representative per enterprise was made to ensure a clear and direct understanding of each company's approach to stress management. This approach also facilitated the collection of coherent and specific data relevant to each enterprise's unique context. The study included SMEs belonging to the group of economic activities according to the European classification system NACE code C (10-33), which represents the manufacturing industry. The choice to focus on manufacturing SMEs was driven by multiple factors. Manufacturing companies were selected because of the high potential for stress related to time pressure, low level of control over work, risk of monotonous work in production halls and warehouses, demanding shifts (especially three-shift or continuous operation), night work, excessive workload, demanding microclimatic conditions, ergonomically demanding working environment and job insecurity (e.g., Sari et al., 2021; Soelton et al., 2020). Another reason for the selection was the assumption that the manufacturing sector represents a key component of Industry 4.0 (Deloitte, 2017), which entails the emergence of new stressors in the work environment. These new realities will require enhanced stress management methods at the organizational level (Leso et al., 2018; Malik et al., 2021). By focusing on this sector, the study aimed to uncover insights that are not only relevant to the manufacturing industry but also applicable to other sectors facing similar challenges.

The data collection strategy employed a structured questionnaire survey to gather quantitative data systematically. The questionnaire design was meticulously planned to facilitate ease of understanding and response accuracy. The inclusion of open, semi-open and closed-ended questions provided a balance that allowed both specific and exploratory responses. The questionnaire was structured to first gather identification information about the companies, followed by more detailed queries related to stress management practices. The inclusion of a cover letter with the questionnaire served to build trust with the respondents, ensuring the confidentiality of their responses and inviting them to engage further with the research outcomes.

After discarding non-valid questionnaires, mainly due to incomplete information, 194 valid responses (with a return rate of 32%) were obtained, representing enterprises suitable for inclusion in the survey. This rate reflects the representativeness of the sample and the relevance of the findings to the broader population of SMEs in the Czech manufacturing sector. The characteristics of the final sample, presented in the accompanying table, offer a detailed breakdown of the participating enterprises, providing valuable context for the analysis and interpretation of the survey results. This comprehensive sample enables robust

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conclusions about the state of stress management practices among Czech manufacturing SMEs.

Table 1 | Basic research sample characteristic

		Small enterprises (<50 employees)		Medium enterprises (50–249 employees)		Total	
		Frequency	Relative frequency	Frequency	Relative frequency	Frequency	Relative frequency
Total		142	100.0%	52	100.0%	194	100.0%
HR presence in workplace	Yes	63	44.4%	38	73.1%	101	52.0%
	No	79	55.6%	14	26.9%	93	48.0%
Multinational enterprises	Yes	18	12.7%	10	19.2%	28	14.4%
	No	124	87.3%	42	80.8%	166	85.6%
Operating results	Profit	121	85.2%	41	78.8%	162	83.5%
	Loss	21	14.8%	11	21.2%	32	16.5%
Turnover rate	< 2%	95	66.9%	24	46.2%	119	61.3%
	2–10%	42	29.6%	23	44.2%	65	33.5%
	> 10%	5	3.5%	5	9.6%	10	5.2%

Source: Own elaboration

The primary data collected through the quantitative survey were analysed using various research methods, including analysis, comparison, synthesis, selection and both inductive and deductive reasoning. However, it is important to note that the normal distribution of the data could not be confirmed through standard normality tests such as the Kolmogorov-Smirnov test, Shapiro-Wilk test, histograms and Q-Q plots. As a result, non-parametric testing methods were employed to evaluate the results.

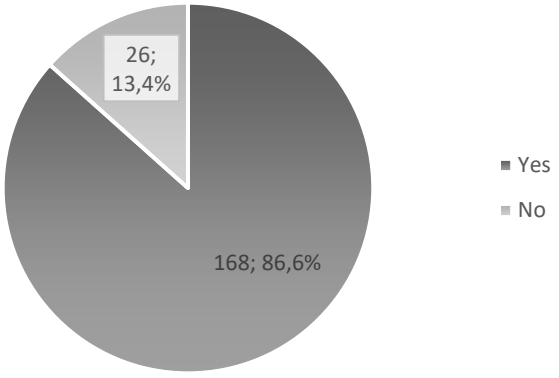
Pearson's chi-square test of independence was utilized to test the hypotheses derived from the data analysis. All the prerequisites necessary for conducting the Chi-square test were met reliably in our analysis. The analysis was performed using the Statistica statistical software, version 12.0. This approach was chosen due to the non-normal distribution of the data, ensuring the reliability and validity of the statistical testing process.

We employed the chi-square test of independence in the contingency table and calculated the resulting Cramer's V parameter to assess the strength of associations between different interventions. Cramer's V values range from 0 to 1, with 0 indicating no relationship and 1 representing a strong relationship. Typically, a value of 0.2 or lower indicates a weak association, while a value between 0.2 and 0.3 suggests a moderate relationship. Values exceeding 0.3 indicate a strong correlation between the interventions.

3 Results and Discussion

The first research question examined whether the companies under study implement the principles of stress management, i.e., whether they have implemented at least one such intervention in the last five years (Figure 1) and what specific type of intervention (Figures 3 and 4). The particular kind of intervention was surveyed to clearly distinguish whether it was an individual-focused intervention (ILI) or an organization-focused intervention (OLI) and thus to clearly interpret the results with a specific generalization, which also allowed testing the first hypothesis.

Figure 1 | Total number of companies adopting SMI



Source: Own elaboration

Table 2 | Implemented type of SMI

SMI	Frequency	Relative frequency
Only OLI	88	45.4%
Only ILI	5	2.6%
Both types	75	38.7%

Source: Own elaboration

The results showed that 86.6% of the companies had implemented at least one intervention in the last five years. Furthermore, it was found that 45.4% of the companies implement only organizational interventions (OLI), 38.7% implement both types of interventions (OLI and ILI) and only 2.6% implement individual stress management interventions (ILI) alone. Overall, 84.1% of enterprises implement OLI and only 41.3% of enterprises implement ILI.

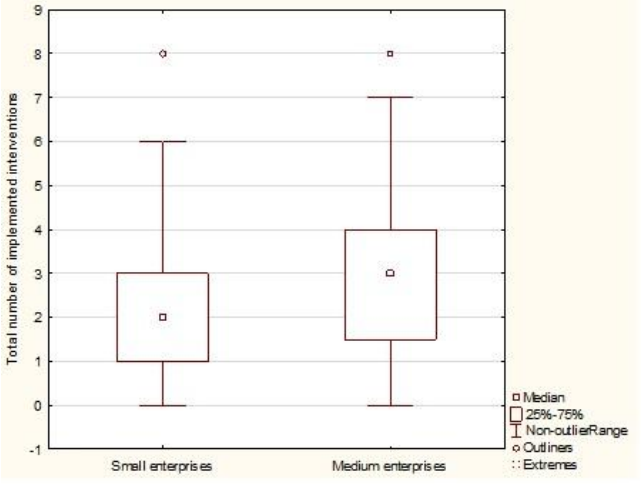
Based on the data, hypothesis H1, which proposed that individual-level interventions (ILI) are more frequently implemented than organizational-level interventions (OLI), was not confirmed. The findings reveal that a higher proportion of enterprises implemented only OLI (45.4%), while 38.7% implemented both OLI and ILI. A mere 2.6% of enterprises exclusively

implemented ILI. A total of 84.1% of enterprises adopted OLI, in contrast to 41.3% implementing ILI, indicating a greater prevalence of organizational-level interventions in enterprise stress management practices.

When we focused on the actual implementation of OLI and ILI by enterprises in the context of their size, it was found that small enterprises implement, on average, 2.2 interventions (1.7 OLI and 0.5 ILI). For medium-sized enterprises, the average number of all interventions is 2.9 (2.1 OLI and 0.8 ILI). The maximum number of interventions introduced by both types of enterprises was 8, as can be seen in Figure 2.

The observed trend of higher implementation rates of stress management interventions (SMI), particularly organizational-level interventions (OLI), in medium-sized enterprises aligns with the EU-OSHA (2022) findings from the OSH Pulse survey. The survey indicated that access to SMI is proportionate to enterprise size, with larger enterprises providing more access. Moreover, the survey revealed that employees in larger companies more frequently report open communication encouraged by management for addressing psychosocial risks, in contrast to smaller enterprises. This suggests that larger enterprises typically offer better access to resources, more availability of OLI, open communication for conflict resolution and enhanced management education, possibly due to the anonymity and infrastructure in larger organizational settings.

Figure 2 | Total numbers of implemented interventions



Source: Own elaboration

The most frequently implemented measure was the introduction of flexible work time (57.7% of enterprises; 97 responses). Other OLI measures are shown in Figure 3.

Figure 3 | Most frequently implemented OLI in companies

Source: Own elaboration

The chi-square test for independence in the contingency table and the resulting Cramer's V parameter, which tracks the strength of the relationship between the two nominal variables, were used to test the relationships between the OLI interventions. Table 3 shows the relationships between all the observed organizational measures, where statistically significant relationships are marked with an asterisk (*), and the strength of the relationships is subsequently verified through Cramer's V.

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Table 3 | Correlations of organizational-level interventions

Correlations of organizational-level interventions		Improving ergonomics	Correct definition of job role	Stress management training for company management	Cooperation with occupational health services	Participative management	Flexible work time	Promoting a healthy organizing culture
Improving ergonomics	Cramer's V	x	0.096	0.065	0.086	0.048	0.033	0.040
	p-value	x	0.180	0.362	0.230	0.504	0.651	0.578
Correct definition of job role	Cramer's V	0.096	x	**0.152**	0.136	0.097	0.126	0.085
	p-value	0.180	x	**0.034***	0.059	0.178	0.080	0.237
Stress management training for company management	Cramer's V	0.065	0.152	x	0.048	**0.164**	0.103	0.031
	p-value	0.362	0.034*	x	0.508	**0.022***	0.151	0.664
Cooperation with occupational health services	Cramer's V	0.086	0.136	0.048	x	**0.191**	0.028	0.038
	p-value	0.230	0.059	0.508	x	**0.008***	0.699	0.597
Participative management	Cramer's V	0.048	0.097	0.164	0.191	x	0.033	0.080
	p-value	0.504	0.178	0.022*	0.008*	x	0.651	0.264
Flexible work time	Cramer's V	0.033	0.126	0.103	0.028	0.033	x	0.053
	p-value	0.651	0.080	0.151	0.699	0.651	x	0.460
Promoting a healthy organizing culture	Cramer's V	0.040	0.085	0.031	0.038	0.080	0.053	x
	p-value	0.578	0.237	0.664	0.597	0.264	0.460	x

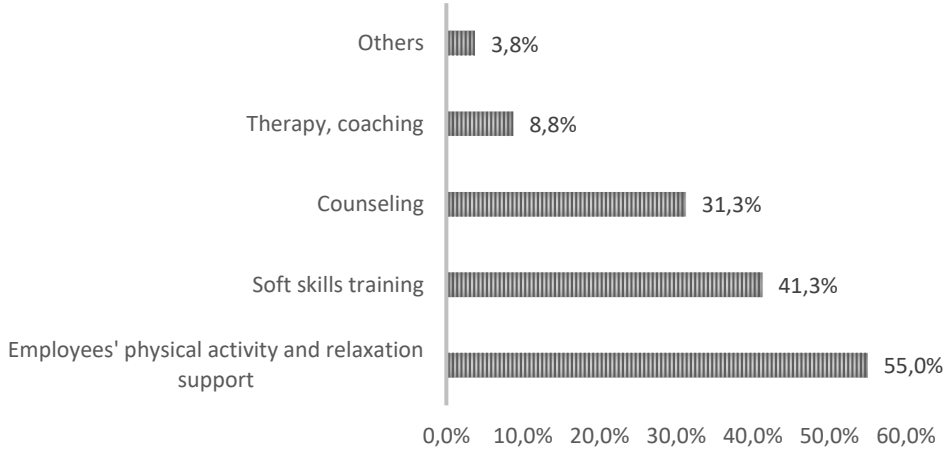
Note: *p < 0.05
Source: Own elaboration

The statistically significant relationship at the 5% significance level is between the pairs "Correct definition of job role" and "Stress management training for company management" (p = 0.034; weak relationship), "Participative management" and "Stress management training for company management" (p = 0.022, weak relationship) and "Participative management" with "Cooperation with occupational health services" (p = 0.008, weak relationship). There are no statistically significant relationships between the other pairs of measures.

The results show that awareness of managers, supported, e.g., by education from experts (stress management training) or support from professional and advisory bodies (OSH, occupational health services), is key to achieving the desired state in the form of, e.g., participative management, clear definition of the employee's role in the workplace and job description.

At the individual level, the most interventions were employees' physical activity and relaxation support (55%), training soft skills (41.3%) and counselling (31.3%).

Figure 4 | Most frequently implemented OLI in companies



Source: Own elaboration

The evaluation of the interrelationships between individual-level interventions (ILI) was carried out in the same way as for the OLI.

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Table 4 | Correlations of individual-level interventions

Correlations of individual-level interventions		Employees' physical activity and relaxation support	Therapy, coaching	Counselling	Soft skills training
Employees' physical activity and relaxation support	Cramer's V	x	0.039	**0.159**	**0.148**
	p-value	x	0.589	**0.027***	**0.039***
Therapy, coaching	Cramer's V	0.039	x	0.008	**0.207**
	p-value	0.589	x	0.910	**0.004***
Counselling	Cramer's V	0.159	0.008	x	**0.153**
	p-value	0.027*	0.910	x	**0.033***
Soft skills training	Cramer's V	0.148	0.207	0.153	x
	p-value	0.039*	0.004*	0.033*	x

Source: Own elaboration

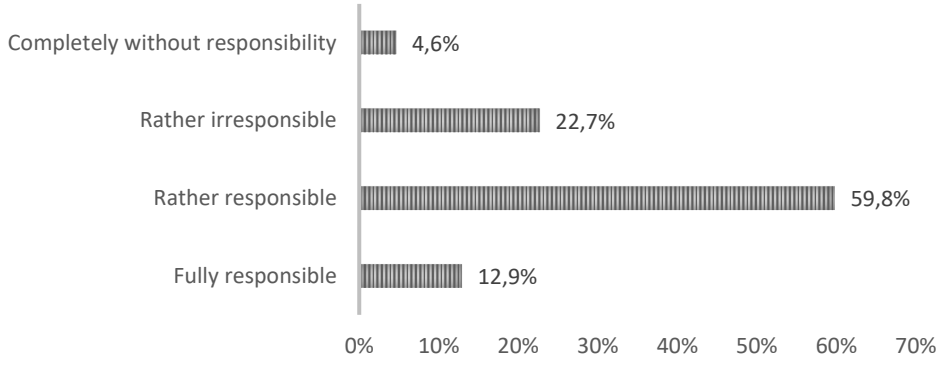
In the case of ILI, it is evident from the data that all the measures are interdependent, except the pair "Employees' physical activity and relaxation support" and "Therapy, coaching" and then the pair "Therapy, coaching" and "Counselling".

Also, within ILI, the strongest relationship between the measures "Therapy, coaching" and "Soft skills training" again points to the need for awareness and training not only of management but also of employees.

When comparing the partial results of this study with the Third European Survey of Enterprises on New and Emerging Risks (EU-OSHA, 2019), there appears to be a notable disparity among European enterprises in assessing their access to information on incorporating psychosocial risks into their internal processes. Less than 42% of Czech businesses feel they have adequate information to integrate psychosocial stress (PS) and stress management (SM) into their management strategies, placing them among the lowest in the EU. This position shows no improvement from 2015. The Czech Republic also ranks lowest in the percentage of action plans for implementing SM principles. In contrast, the UK and Sweden hold top positions, indicating a significant variance in the implementation of SM across Europe.

To address the second research question, the survey incorporated an ethics-focused question regarding companies' responsibility in managing work-related stress. The objective was to ascertain employers' attitudes towards this issue. Survey participants were queried on whether they perceive themselves as being fully responsible, rather responsible, rather irresponsible, or completely without responsibility in addressing workplace stress. Figure 5 illustrates the extent of an enterprise's responsibility in addressing work-related stress.

Figure 5 | Enterprise stance on its responsibility in addressing work-related stress



Source: Own elaboration

To explore the correlation between companies' perceived responsibility for managing work stress and the implementation of stress management principles, the chi-square test of independence was utilized in a contingency table analysis.

Table 5 | Responsibility for work stress and SM implementation

Claim	Stress management implementation		Total
	No	Yes	
The organization is fully responsible for the level of work stress of its employees.	3 (12%)	22 (88%)	25 (100%)
The organization is rather responsible for the level of work stress of its employees.	12 (10.3%)	104 (89.7%)	116 (100%)
The organization is rather irresponsible about the level of work stress of its employees.	9 (20.5%)	35 (79.5%)	44 (100%)
The organization is completely without responsibility for the level of work stress of its employees.	2 (22.2%)	7 (77.8%)	9 (100%)
Total	26 (13.4%)	168 (86.6%)	194 (100%)

Source: Own elaboration

The findings indicate that organizations acknowledging a degree of responsibility for managing work stress (those selecting "fully responsible" or "rather responsible") apply stress management (SM) strategies in approximately 89% of instances. In contrast, companies perceiving themselves as not accountable for managing work stress (choosing "rather irresponsible" or "without responsibility") implement such measures in roughly 78% of cases.

Utilizing the chi-square test of independence in the contingency table, with a p-value of 0.325, it was determined that the implementation of stress management principles does not have a

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statistically significant association with companies' perceived responsibility for the level of work stress among their employees.

It is crucial to recognize that stress management in the workplace is a shared responsibility of both the individual and the employer, akin to other health and safety concerns. The task of managing stress within the workforce is arduous without a unified understanding and collaborative effort. Effective management of workplace stress is achievable only through joint efforts between employers and employees.

Of course, the degree of attention paid to workplace stress management is strongly determined by the degree of attention that company management, or managers, pay to it and whether they understand the care of their employees as their own ethical responsibility and the essence of their work. As the findings of, e.g., ESENER-3 (EU-OSHA, 2019) and partly ESENER-2 (EU-OSHA, 2015) show, management commitment to managing psychosocial risks in the workplace is primarily driven by legal requirements. However, no specific law in the Czech Republic addresses workplace stress and its management. In general, employers are required under the OSH Act to ensure health, safety and adequate working conditions for their employees. Employers should nevertheless consider including an assessment of the risks of work-related stress (including an adequate response) as part of their workplace risk assessment, even though they have yet to be explicitly required to do so by Czech law.

The third research question focused on identifying stress factors in the workplace, particularly highlighting novel stress sources emerging from the fourth industrial revolution and the consequent digitization of work environments, commonly referred to as "technostress".

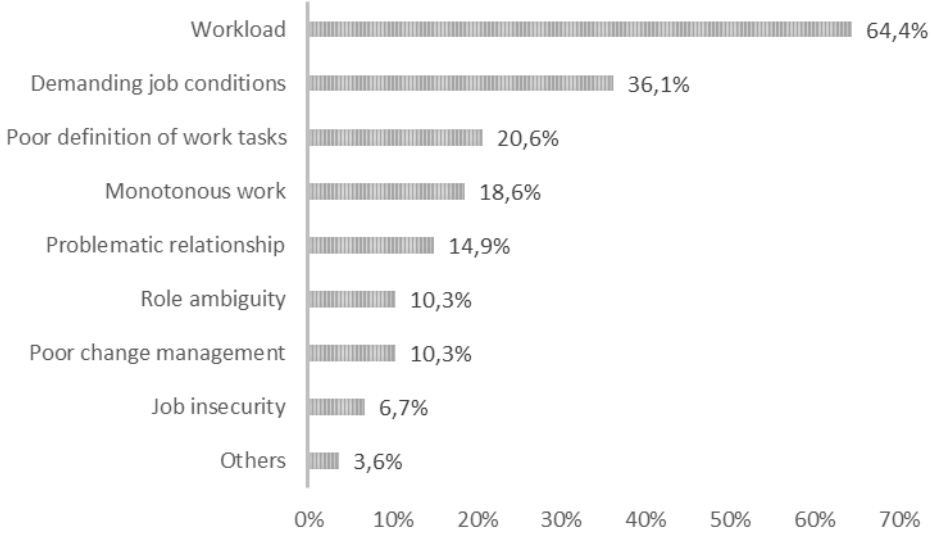
Table 6 presents the critical stressors identified and rated by the employers, representing the primary sources of stress within their organizational environment. The stressors in the table are arranged in the order of occurrence, from most frequent to less frequent.

Table 6 | Assessment of stress factors in business environments

Stressors	Yes		No	
	Frequency	%	Frequency	%
Workload	125	64.4%	69	35.6%
Demanding job conditions	70	36.1%	124	63.9%
Poor definition of work task	40	20.6%	154	79.4%
Monotonous work	36	18.6%	158	81.4%
Problematic relationship	29	14.9%	165	85.1%
Role ambiguity	20	10.3%	174	89.7%
Poor change management	20	10.3%	174	89.7%
Job insecurity	13	6.7%	181	93.3%
Others	7	3.6%	187	96.4%

Source: Own elaboration

Figure 6 | Stressors in the workplace



Source: Own elaboration

Unsurprisingly, the manufacturing enterprises surveyed consider workload to be a significant source of work stress, which can be attributed to the high production quotas they face and the forced work pace determined by dependence on machines or the rhythm of co-workers. Demanding working conditions, often characterized by difficult microclimatic conditions, noise, three-shift or continuous operation, are an unquestionable stressor in the

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manufacturing environment, as highlighted by the studies of Sari et al. (2021) and Soelton et al. (2020).

In examining Industry 4.0 as a potential source of stress, it was found that only 2.1% of companies consider Industry 4.0 to be a significant stressor for employees, for example, due to concerns about robotics leading to job losses. A further 10.8% of enterprises consider it a moderate stress source. On the other hand, 39.2% consider it a relatively insignificant stressor and 47.9% of enterprises do not perceive Industry 4.0 as a workplace stressor at all.

After analysing the correlation between management support for SMI and perception of Industry 4.0 as a significant stressor, it was found that there was no statistically significant relationship between the two (chi-square test for independence in contingency table, $p = 0.427$).

Table 7 | Assessment of stress factors in business environments

Stress management implementation		Industry 4.0 represents a significant stressor for our employees				Total
		Yes	Rather yes	Rather no	No	
Company management supports implementation of work-related interventions	Yes	0 (0.0%)	6 (28.6%)	18 (23.7%)	21 (22.6%)	45 (23.2%)
	Rather yes	2 (50.0%)	5 (23.8%)	27 (35.5%)	36 (38.7%)	70 (36.1%)
	Rather no	1 (25.0%)	7 (33.3%)	21 (27.6%)	20 (21.5%)	49 (25.3%)
	No	1 (25.0%)	3 (14.3%)	10 (13.2%)	16 (17.2%)	30 (15.5%)
Total		4 (100.0%)	21 (100.0%)	76 (100.0%)	93 (100.0%)	194 (100.0%)

Source: Own elaboration

Despite the results of the companies' views, it is clear that the increased interconnectedness and continuity of Industry 4.0 production processes will transform the traditional work organization from a model of strictly separated departments to a more flexible structure with decentralized links, leading to a transformation of traditional industries. This will result in both disappearance of certain occupations and industries and creation of new job opportunities. Robotization and automation will move employees from routine and low-skilled positions into roles that require independent decision-making and collaboration with automated monitoring and optimization systems (McKinsey, 2015). The workforce is expected to shift from the industrial sector to the service sector, particularly in areas requiring higher skills to support new activities in the fourth industrial revolution. This trend will have far-reaching economic and social impacts on society.

Industry 4.0 was also the focus of some statements to which the surveyed companies provided their opinion in the research. It was investigated whether these attitudes have an impact on application of stress management principles by the companies in their workplaces,

i.e., whether they implement stress management interventions. The correlation is presented in Table 8 and the results of the statistical testing are in Table 9.

Table 8 | Assessment of stress factors in business environments

Claims[1]		Stress management implemented			
		No		Yes	
		Frequency	Relative frequency	Frequency	Relative frequency
Our organizational climate supports learning.	Yes	20	76.9%	133	79.2%
	No	6	23.1%	35	20.8%
Our enterprise actively tries to prevent stress in the workplace.	Yes	15	57.7%	126	75.0%
	No	11	42.3%	42	25.0%
The company management supports implementation of work-related interventions.	Yes	12	46.2%	103	61.3%
	No	14	53.8%	65	38.7%
Our education system focuses on the future and Industry 4.0	Yes	2	7.7%	61	36.3%
	No	24	92.3%	107	63.7%
Industry 4.0 represents a significant stressor for our employees.	Yes	3	11.5%	22	13.1%
	No	23	88.5%	146	86.9%

Source: Own elaboration

Table 9 | Assessment of stress factors in business environments

	Test statistics	Degrees of freedom	p-value
Our organizational climate supports learning.	0.068	1	0.794
Our enterprise actively tries to prevent stress in the workplace.	3.397	1	0.065
The company management supports implementation of work-related interventions.	2.142	1	0.143
Our education system focuses on the future and Industry 4.0.	8.409	1	**0.004***
Industry 4.0 represents a significant stressor for our employees	0.049	1	0.826

Note: *p < 0.05
Source: Own elaboration

[1] *In cases where the answers were "Yes", "Rather Yes", "Rather No" and "No", or in a similar form, the data were merged into two Yes/No categories for testing purposes.*

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Of the attitudinal questions studied, only the statement "Our education system focuses on the future and Industry 4.0" has an impact on the implementation of stress management interventions ($p = 0.004$). The lack of interest in the training system and subsequent training programmes can be perceived as a potential threat to the implementation of Industry 4.0 initiatives. According to Hecklau et al. (2016), addressing new socio-economic changes will require making use of competencies, such as the growing need for innovation and increasing engagement with new information technologies. Similarly, Ejsmont (2021) asserted that employees' readiness for Industry 4.0 should be bolstered by training within the framework of this initiative, as willingness to adapt and learn stands among the main barriers to its implementation. Stentoft et al. (2019) highlighted the insufficient knowledge about Industry 4.0 and lack of trust as potential barriers to its adoption. Furthermore, due to this lack of knowledge and readiness, employees may experience fear, uncertainty and stress, perceiving Industry 4.0 and its associated changes as stressors. Training means prevention as a part of SMI.

When comparing the results of the conducted research with the relevant findings of Koval'ová et al. (2018), who focused on the identification of the relationship between sources of stress and its consequences in the context of the work environment in a sample of 208 respondents, it is evident that there is a significant correlation between the presence of stressors and their negative impact on individuals or employees. This established relationship confirms that sources of stress are directly related to the experience of stress, which is manifested through a wide range of symptomatic consequences. These consequences include perceived work overload, reduced ability to concentrate, feelings of fatigue, sleep disruption, postponement of important tasks, loss of motivation to work, emotional instability and various physiological symptoms. Based on these findings, it can be concluded that work stress has a complex impact on the individual, affecting both his physical and psychological state, resulting in significant disruption to both his personal and professional life. This impact subsequently has a negative impact on the overall performance and effectiveness of the organization.

It is evident that implementing stress management strategies in organizations is not a short-term issue. The process requires overcoming obstacles at both the individual and the organizational level and involves the mobilization of considerable resources. According to the results of the questionnaire survey, the surveyed organizations identified lack of time and staff capacity (37.6%), lack of interest on the part of employees (36.5%), limited awareness of stress management strategies (20%), lack of financial resources (12.9%), lack of management awareness (10.6%), lack of methods and tools (9.4%) and lack of experts (8.2%) as the main obstacles to successful implementation of stress management measures. Comparing these results with data collected at the European level in the 2019 ESENER study (EU-OSHA, 2019), it appears that the most common problem in implementing psychosocial risk management in other countries is the complexity of the legal framework. In this respect, the Czech Republic achieved a relatively high share (42% of enterprises), which is significantly higher than the results from Lithuania (14%), Serbia (15%) or Norway (12%). In Belgium (47%) and France (46%), lack of time and staff capacity is perceived as a key barrier to psychosocial risk management, with the Czech Republic recording a share of 34% in this respect, which is in line with the results of our study (34% versus 37.6%). This confirms that

lack of time and staff is a significant barrier to psychosocial risk management both in the context of this paper and in the wider European context, according to the 2019 ESENER study (EU-OSHA, 2019).

Conclusion

The findings of this study highlight the extent to which SMEs are currently implementing various stress management interventions and the need to adopt more comprehensive and effective strategies. The data reveal gaps in current practices and point to the potential for improved approaches that could better address the unique stressors prevalent in the manufacturing sector.

Compared to other European countries, the approach to managing psychosocial risks and workplace stress in the Czech Republic is strikingly inadequate. This is evidenced by the lowest percentage of action plans for stress management in Europe, low level of implementation of stress management, limited awareness, limited communication on mental health issues and insufficient legislative support. Despite the European Framework Agreement on Work-Related Stress issued by the EU in 2004 with a three-year recommended implementation period, the Czech Republic has not fully incorporated these commitments into its domestic legislation. Therefore, until workplace stress management is explicitly regulated by law, it will lack enforceability and the possibility of sanctions in case of non-compliance.

Effective workplace stress management is essential to fostering a positive work atmosphere that nurtures happy and productive employees and can lead to a competitive advantage for the enterprise. Recognizing that psychosocial risks are as important as physical risks in the workplace and require targeted management strategies is essential. Businesses are advised to take a proactive approach to stress management (SM) and prioritize prevention of psychosocial risks or implement corrective measures where psychosocial risks have already manifested themselves. In addition, it is essential to secure commitment to stress management from all stakeholders and then integrate it seamlessly into a well-defined workplace stress management policy.

Figure 7 visualizes the authors' proposed recommendations for implementing SM in companies. The model also serves as a platform between theoretical knowledge and practical recommendations in the field of stress management and specific empirical data obtained from research. In this way, it offers a basis for the effective implementation of stress management strategies in enterprises of different sizes, including SMEs.

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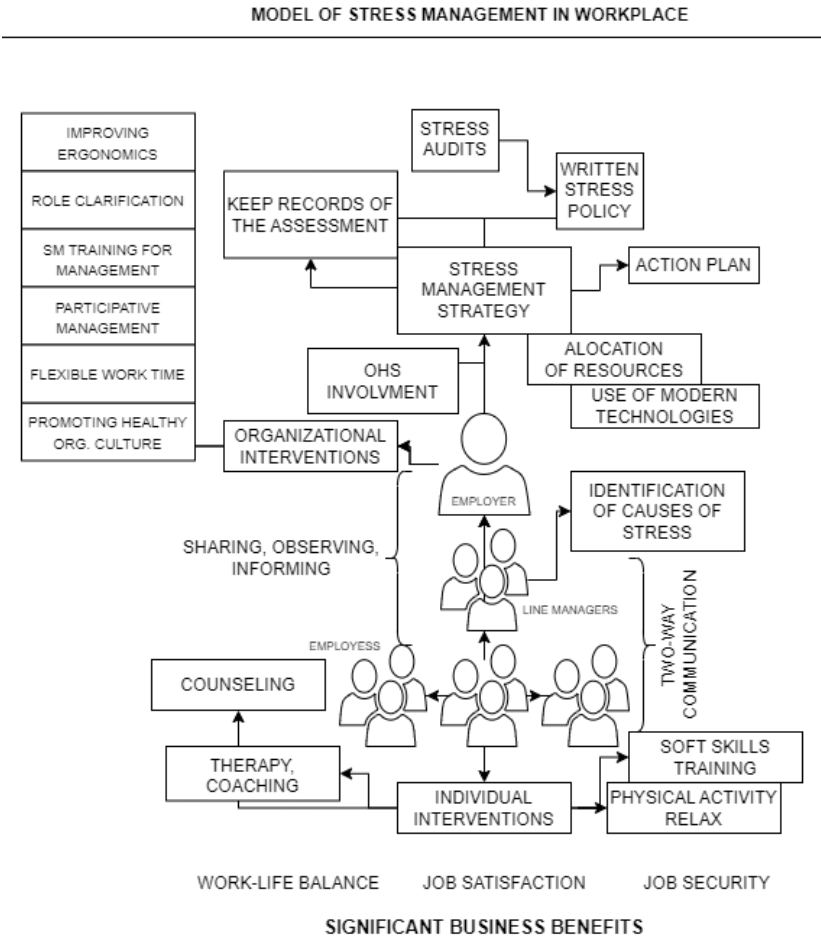
Figure 7 | Stress management in the workplace



Source: Own elaboration

For successful stress management (SM) implementation, a well-defined company policy should include a detailed action plan. This plan should be based on a thorough work stress audit and risk assessment, with communication extending to all staff levels. Maintaining written records of identified risks and results is beneficial. Effective implementation, particularly for organizational-level interventions (OLI), hinges on absolute management support and a top-down approach. Management should provide necessary resources, such as personnel, money and time, to enforce the stress management policy, fostering open communication about psychosocial risks and informing workers about workplace resources and dangers. Once risks are identified and assessed, a written policy and action plan are developed, leading to implementing risk prevention or elimination measures. This process involves collaboration with external experts, including occupational safety and health (OSH)

specialists, risk prevention professionals, health services and organizations offering stress management training.

For interventions focused on the individual level (ILI), it is advisable to allocate relaxation time, implement wellness programmes and provide incentives for physical activities such as MultiSport Cards. Prioritizing work-life balance is also crucial. Line managers are pivotal in stress management (SM) as they are tasked with identifying potential stressors within their teams and managing workloads through preventive and proactive strategies. Reporting these observations and actions to senior management is essential. Furthermore, regular SM training for line managers is vital to equip them with the necessary skills and knowledge for effective stress management.

Companies should incorporate stress management into their internal processes as part of effective management practices. Encouragingly, the survey revealed that nearly three-quarters of the companies surveyed recognize their responsibility for managing stress in the workplace. This indicates a shift in the perception and approach to work stress in Czech companies with a trend towards interventions at the organizational level. These interventions focus on long-term company-wide measures rather than short-term solutions at the individual level, are more aligned with overall business processes and have an impact on the whole organization.

Limitations, future research directions

Although the methodology used in this study provided valuable insights into stress management practices in Czech SMEs, it is essential to recognize its limitations to fully understand the context and applicability of the findings. One of the main limitations is the geographical scope of the study, which was limited to one country. This regional focus may limit the generalizability of the results internationally. In addition, the focus of the survey on the manufacturing sector means that the findings may not be directly applicable to other industries where stressors and management strategies may differ significantly.

Furthermore, the cross-sectional nature of the study provides an overview of stress management practices at a point in time but does not allow tracking changes over time or long-term effectiveness of interventions. Despite these limitations, the study offers a foundation for future research into workplace stress management.

To build on the work presented here, future studies could expand the geographical scope and conduct comparative international research. Investigating stress management in different industries outside of manufacturing would also allow a more comprehensive understanding of how different work environments and industry-specific stressors affect the implementation and effectiveness of stress management strategies.

Using longitudinal research designs would be particularly beneficial for understanding the long-term impacts of stress management interventions. Such studies could track changes over time, providing insight into the sustainability and evolution of these practices. In addition, incorporating qualitative methods such as interviews or focus groups could offer deeper insights into the subjective experiences of employees and managers. This approach would allow researchers to explore the nuances of how individuals perceive and cope with stress in

the workplace, as well as their attitudes and experiences of different stress management interventions.

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