



Enhancing well-being: evaluating the impact of stress management interventions for IT professionals in the workplace

V. S. Iswarya¹ · M. Babima² · M. Gnana Muhila³ · R. Dhaneesh⁴

Received: 7 September 2023 / Revised: 18 March 2024 / Accepted: 7 April 2024 / Published online: 25 April 2024

© The Author(s) under exclusive licence to The Society for Reliability Engineering, Quality and Operations Management (SREQOM), India and The Division of Operation and Maintenance, Lulea University of Technology, Sweden 2024

Abstract Workplace stress is a common ailment that harms society, businesses, and individuals. People who work in the information technology industry are under higher stress because they must constantly refresh their knowledge. The purpose of this study is to examine the impacts of stress management intervention techniques on improving the well-being of IT professionals in the working environment. The recommended task is broken into two stages: The firststep is to collect the data using the prepared questionnaire from employees working in an organization. 142 Data were collected using the prepared questionnaire from the supervisors and managers of the selected four IT companies and the suggested hypothesis serves as the foundation for the questionnaire's design. The gathered data is assessed in the second phase using SEM, descriptive statistics, F-test, and correlation analysis. The results of the study indicate that mindfulness, resilience, psychological interventions, managerial grid training, and wellness programs significantly increase the well-being of IT professionals (p -values of 0.011, 0.018, 0.002, 0.005, and 0.003, respectively). In contrast, behavioral intervention, conflict management, and

work role training programs had non-significant effects (p -values of 0.229, 0.102, and 0.063, respectively).

Keywords Workplace stress · Stress management · Stress management intervention · Effectiveness · IT professions · Training programs

1 Introduction

Conceptualization of pressure at work is very significant while creating workplace initiatives. Stress at work is defined as "a detrimental reaction in which people have to exert excessive pressure and demand at work." Job stress can lead to harmful illness, but it can also lead to mental stress and mental illness (Riva and Chinyio 2018; Richardson and Rothstein 2008). Recognizing the importance of addressing stress in the IT sector, there is a need for a targeted intervention focused on stress management to enhance the well-being of IT professionals. Current strategies may be insufficient in mitigating the unique stressors faced by IT professionals, and a dedicated intervention could prove instrumental in the development of a healthier work environment. The purpose of this study is to evaluate the efficacy of a stress-management program personalized for IT professionals, seeking to understand its impact on mitigating stress levels, improving overall well-being, and ultimately enhancing job satisfaction and performance in the IT work environment. By addressing the specific challenges faced by IT professionals and evaluating the outcomes of the stress management intervention, this study aims to contribute valuable insights that can inform strategies for promoting the well-being of IT professionals and optimizing their performance in the workplace.

✉ V. S. Iswarya
vswarya696@gmail.com

¹ Department of Business Administration, Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli, Tamil Nadu, India

² Department of Management Studies, St.Xavier's Catholic College of Engineering, Nagercoil, Tamil Nadu, India

³ Department of Commerce, Holy Cross College, Nagercoil, Tamil Nadu, India

⁴ Department of Management Studies, Rohini College of Engineering and Technology, Anjugramam, Tamil Nadu, India

The significant increase in stress at work is associated with international and domestic recessions, unstable employment, and work efforts, all of which lead to huge workloads and relational disputes. Job performance is about the physical and mental health of employees (OommenJoshy 2014). Organizations in the IT industry face many challenges in this context. Work-related stress is inevitable for IT staff as systems, processes, and advanced technologies become more complex day by day. Some workers struggle to adapt to changes in the workplace. For IT personnel, this is stressful.

The majority of Information Technology (IT) personnel experience stressful situations and are more vulnerable to health issues as a result (Bhui et al. 2016). Excessive work, gender inequality, and an absence of sufficient rewards are among the problems that the IT sector frequently experiences. Information technology involves lots of stress, which lowers production due to a lack of work engagement and reduced turnover. In practically every IT firm, "stress management" has now become a keyword due to the issue of increased job stressors among IT professionals (Giga et al. 2003; Landsbergis 2018). The term "occupational stress" relates to organizational methods, employee welfare initiatives, psychosocial interventions, etc. Employers' physical, psychological, and behavioral stress levels can be prevented and reduced through the use of mindfulness meditation practices, which also improves the workers' day-to-day tasks at home and in the workplace.

The Indian economy is heavily dependent on the information technology field, which is one of the most challenged industries including the banks and tech industries (Badu et al. 2020; Havermans et al. 2018). Professionals in the information technology sector may experience job stress that may affect a person's physical health, the calibre of their profession, their interactions with others in the community, and their family duties. Consequently, it's crucial to establish the precise source of stress and its effects on the employee's health (Verweij et al. 2018). Additionally, it is crucial to offer information that will enable HR executives and management experts to further develop existing managerial skills in managing stress among IT firms. Companies can achieve a higher level of effectiveness, strengthen relationships, and lowering illness and absence rates by enhancing personnel well-being and reducing stress (Vonderlin et al. 2020; Chin et al. 2019). A collection of activities that are considered "stress management interventions" are employed by organizations to enhance employee satisfaction and minimize stress, primarily through addressing the causes of stress or lessening its consequences on a worker.

1.1 Research contribution

The main objective of this research study is to determine stress reduction solution programs utilized in a business to

lower the degree of stress in IT professions and improve employee wellness. The following are the research work's contributions:

- To assess the value of stress intervention programs in a company to improve employees' wellness and mindfulness at work.
- To gather the data, a standardized questionnaire was delivered to the IT specialists.
- To achieve the intended result, SEM and ANOVA tests were performed on the information obtained from pertinent authorities.

The paper mentioned above explained several stress management intervention options. In this research work, individual-related stress management intervention techniques like mindfulness training, resilience training, psychological intervention programs, and behavioural intervention programs impacting the well-being of IT professionals were explored. Also, the organizational-related stress management intervention techniques like conflict management training, managerial grid training, work-oriented training, and wellness programs impacting the well-being of IT professionals were evaluated.

1.2 Research motivation

Everyone experiences stress at some point in their lives. How to manage stress and ensure that experts are not injured should be the IT industry's first concern. Because it is simple for levels of the workforce to lose concentration and for their feelings to expand and affect some other workers through their behaviors because of the effect of being in stressful situations, it is imperative to have an efficient stress management system in place. Organizations must do their best to control the dynamic change (causes) that surrounding the environment and the workplace. People, their mental and physical states, and the organization are all impacted and affected in a variety of ways by stress. One of the main reasons for poor outcomes, productivity, profitability, and other factors is due to this. This study's objective is to assess if stress management intervention strategies can improve IT workers' workplace well-being.

1.3 Research objective

Numerous research studies have shown that job stress is still a significant factor in how well.

Individuals in the IT sector perform. This is because job stress and performance are directly related. Some of the research endeavors are as follows:

- To understand the nature of stress faced by the IT professional.
- To recognize factors that lead to occupational stress among IT employees
- To identify the stress levels those are experienced by employees
- To comprehend the intervention approaches for managing stress that contributes to the health of IT professionals.

1.4 Research questions

The efficiency of occupational stress management strategies in the IT sector and how mindfulness and professional wellness are impacted by the questions that follow are for research look into. It will also be helpful to look at how stress affects employees' well-being. Furthermore, it would function as a roadmap for the study that was carried out and the development of conjectural connections between the two depictions of the different elements.

RQ₁ Does the lack of individual stress management techniques for IT lead to health problems related to job stress?

RQ₂ Does the use of organizational stress management techniques impact employees' well-being at work?

RQ₃ Do personal stress management techniques contribute to minimizing stress at work?

RQ₄ Do organizational stress-reduction measures help in reducing employees' stress levels?

The remainder of this research study is divided into 4 groups as follows:

- Section 2: A review of the literature related to stress management within organizations and its effects on workers' performance is presented
- Section 3: Methodology and research design
- Section 4: Scientific Method, Studies and Conversations
- Section 5: Conclusion

2 Literature review

The researcher has chosen to base this investigation on a thorough analysis of pertinent literature to offer a well-informed viewpoint on managing pressure and stress. Most of the literary genres will be found in textbooks, periodicals, and earlier studies. This investigation will concentrate on both quantity and research to provide the person with a comprehensive understanding of the topic of tension and its management. The researcher wants readers to be able to quickly absorb the information by making this study clear and understandable. To give additional information about the influence of stress management in organizations and how it affects employees' performance, a review of all these

papers and books was conducted. Some theories have been employed to gain a better understanding of the impacts of stress and how to manage it. Table 1 shows the merits and demerits of related works.

2.1 Related works

In 2018 Holman et al. (2018) explained different levels of factors causing stress among the employees in the organization. They discussed forms of pressure interventions the company should use. They carried out a survey and obtained the necessary data from the employed people. They conducted research and discovered that by using good coping mechanisms, job stress can be reduced.

In 2019 Eby et al. (2019) suggested that mindfulness training programs help to reduce the stress/strain of employees. They focused on staff relaxation exercises and meditation. The practice of attentive awareness was also developed, presented, and assessed. The benefits of practicing mindfulness in professional settings are investigated, along with the implications for which it may be helpful.

In 2020 Talati et al. (2021) demonstrated that a healthy workplace program enhances the health and wellbeing of employees. 350 Program participants from 204 organizations provided the information that was gathered. Using the data they had collected, they conducted the Wallis–Kruskal examination. Their findings indicated that an organization's effective service boosts its staff members' well-being.

In 2020 Sarah Angela Kriakous et al. (2021) explored the stress of healthcare professionals. They added that practicing mindfulness will help people experience less stress that is related to their health. They carried out a survey and gathered data from the relevant authorities. They conducted research and discovered that stress reduction based on mindfulness will benefit medical workers.

In 2021 Akerstrom et al. (2021) explained the stress intervention at the organizational level. They gathered information from the organization's management and HR partners. They collected information regarding staff working conditions, health, employee turnover, and health problems. They conducted research and discovered that employee motivation has no impact on their health. Also, they discovered that an intervention has little impact on absences or staff turnover.

In 2021 Daniels et al. (2021) demonstrated that well-being practices enhance the performance of employees in an organization. They polled 58 organizations and gathered information from 6968 workers. They conducted research and discovered that well-being practices in an organization will improve employees' psychological well-being. They also concluded that well-being practices have a positive impact on the economy and employees' welfare.

In 2021 Mihalits et al. (2021) explored the effectiveness of stress management strategies in an organization. They

Table 1 Review Analysis of the Existing Articles

Citation	Merits	Demerits
Holman et al. (2018)	It helps in comprehending the many stress-inducing factors that affect personnel at different levels within an organization	there is a need to improve the quality of the evidence base on SMI
Eby et al. (2019)	Programs for mindfulness training are useful in lowering employee stress and tension	The qualitative review does not offer effect size estimates, limiting insight into the specific outcomes where mindfulness-based training might exhibit varying degrees of effectiveness
Talati et al. (2021)	Programs for mindfulness training are useful in lowering employee stress and tension	Those who completed the survey are likely to use the service more than those who interacted with HWWA but didn't finish the survey
Kriakous et al. (2021)	People's stress levels related to their health can be considerably decreased by mindfulness	small sample sizes
Akerstrom et al. (2021)	Organizational stress intervention is the main topic of discussion	This study uses reference groups from a higher organizational level than the intervention groups when analyzing sickness absence and employee turnover
Daniels et al. (2021)	It has been demonstrated that well-being initiatives greatly raise employee performance levels in a company	Single-item measures of health may have limitations compared to multi-item measures
Mihalits et al. (2021)	The study contributes to the investigation of stress management techniques' effectiveness inside an organization	The results of evaluating SMIs are limited in generalization
Lagrosen and Lagrosen (2022)	Helps to know the strain an employee feels at work and the health issues that arise from that strain	The response rate was likely to be low
Dhayalan et al. (2021)	Knowledgeable about the sources, effects, and coping techniques of stress	–
Subha et al. (2021)	The study looks at how women software professionals who worked remotely during the COVID-19 outbreak in metropolitan Bangalore were affected psychologically by their jobs	The constraints imposed to manage the spread of the infection led to an increase in brutality
Warrier et al. (2022)	This study uses the Monitor Acceptance Theory (MAT) to investigate how mindfulness affects Organisational Role Stress (ORS)	–

assessed SMI in a business, and the findings indicated that stress management techniques can improve employees' motivation and engagement at work. They also concluded that the respondents in groups were quite delighted with the stress management techniques used on an individual basis.

In 2022 Lagrosen and Lagrosen (2022) demonstrated the employee's work stress in an organization and their health-related issues due to the stress level. They developed a questionnaire survey and asked organization employees to provide the essential information. The pressures of a workplace and employees' well-being are covered in the questions. It was discovered through correlations and cluster analysis shows a link between effective leadership and worker well-being. Managing quality will also lower employee stress levels in a business.

In 2021 Dhayalan et al. (2021) analyzed work stress among software employees. The objective of this study is to know the causes and effects of stress and to identify coping strategies to manage stress. The data was collected directly from the employees. The sample size was 100. Both primary and secondary data were used for analysis in this study. It was found that 72% of the respondents are affected due to stress, majority of the respondents responded that change in the workplace, higher targets and achievements, personal reasons, administration works, and other reasons are the causes and effects of stress.

In 2021 Subha et al. (2021) examined the impact of occupational stress factors on the mental health of women software professionals working remotely in urban Bangalore during the COVID-19 pandemic. The exploratory factor analysis identifies workload, job insecurity, poor work environment, personal problems, and lack of structure as the main five factors of occupational stress while working from home for women IT employees in urban Bangalore. Multiple regression analysis undertaken in the study indicates that the relationship between the five factors of occupational stress and mental health is negatively significant with an inverse relationship.

In 2022 Warriar et al. (2022) examined the influence of mindfulness on Organizational Role Stress (ORS) based on the Monitor Acceptance Theory (MAT) perspective. This study is based on a cross-sectional data analysis collected from 137 employees working at an Indian IT organization located in Bangalore (India). ORS and MAAS scales have been used for measuring ORS and mindfulness, respectively. Overall, the study findings have indicated a negative relationship ($r = -0.588$) between mindfulness and ORS.

2.2 Research gap

Effective coping mechanisms and the challenge of managing stress have been the subject of several studies. Reviews of numerous research that were cited in journals, theses, and

dissertations are offered in two parts. They are studies that focus on stress in general, stressors, and stress management techniques. The material below is discovered from a review of the literature. Professionals who work for information technology firms are under a lot of stress. Because stress harms employees' health and performance, IT businesses and individual employees are very concerned about it. A few studies on the causes of employee stress and coping mechanisms have been conducted. The effectiveness of digital interventions in managing or preventing poor mental health in the workplace has previously been the subject of systematic literature reviews that have concentrated on reducing stress and symptoms of poor mental health without addressing associations with other psychological, behavioral, or occupational outcomes. For instance, (Michie et al. 2017) review looked at how well eHealth interventions worked to reduce mental health conditions in the workplace and found that, when compared to CBT and mindfulness interventions, stress management interventions had the highest levels of heterogeneity and small effect sizes. This highlighted the differences in the effects of these interventions when given to specific employees as opposed to all employees. Additionally, a meta-analysis conducted by Carolan et al. (2017) found that digital mental health interventions can improve workers' psychological well-being as measured by decreased levels of stress and/or depression and increased productivity at work. This underscores the significance of addressing associations with a broader range of occupational outcomes. Simultaneously, there exists a dearth of thorough research on the efficacy of digital treatments in enhancing psychological well-being and investigating their correlations with other psychological and organizational outcomes (Armaou et al. 2020).

To analyze this issue and come up with appropriate answers, an in-depth research study is required. Two general forms of stress intervention programs have been seen in organizations and within their workforce. (i) Individual-Level Stress Intervention Programs (Mindfulness Training program, Resilience Training program, Psychological Intervention, and behavioral intervention) and (ii) Organizational-Level Stress Intervention Programs (Conflict management training program, managerial Grid Training program, Work Role Training program, and Wellness Program). The study's findings will be tremendously beneficial to both IT organizations and IT professionals. The investigation will thus be in the wider interest of society.

2.3 Theoretical framework

In recent decades, the transactional theory of stress has perhaps had the biggest impact. This implies that stress is neither a characteristic of a person nor of a situation. Instead, stress is the result of the person's assessment of the

circumstance and happens as a transaction, or interaction, between the situation and the individual. A person’s perception of the circumstance as a threat is the primary appraisal worry; their perception of their resources, especially personal resources, as a means of coping with the threat, is the secondary appraisal issue. The workplace is one of the many contexts in which this theory has been used (Strauss et al. 2018). Even in the face of extremely demanding work environments, the transactional theory of stress may be useful in enabling people to recognize stress-related assessments and determine the most appropriate course of action. Two psychological techniques that may promote better awareness of stress-related (and other) appraisals, reevaluation or nonjudgmental acceptance of these appraisals, and increased awareness of the options for responding to these appraisals are cognitive behavioral therapy (CBT) and mindfulness-based cognitive therapy (MBCT).

2.4 Significance of the study

The major objective of the study is to determine or look at how interventions for stress management affect the IT environment. The study findings will outline practical strategies for stress management in the IT industry. It will demonstrate how stress management can enhance or negatively impact performance, as well as how to recognize and manage stress. This study will aid in identifying the methods and resources for stress management as well as the numerous stressors in our environment and how to manage them. This study will demonstrate that stress can have both beneficial and negative effects, depending on how much it influences a person’s ability to do their duties. Although stress in workplaces cannot be completely eradicated, a reasonable level promotes better outcomes. Ultimately, there is a narrow line between being under enough stress to carry out one’s responsibilities and being unduly stressed to the point where it harms

you by making you lose focus and manners. As a result, this research will teach us about the various approaches that are available and induce, impact, and treatment of stress. Figure 1 illustrates the framework of the Research Hypothesis.

2.5 Research hypothesis

Individual Stress Management Intervention.

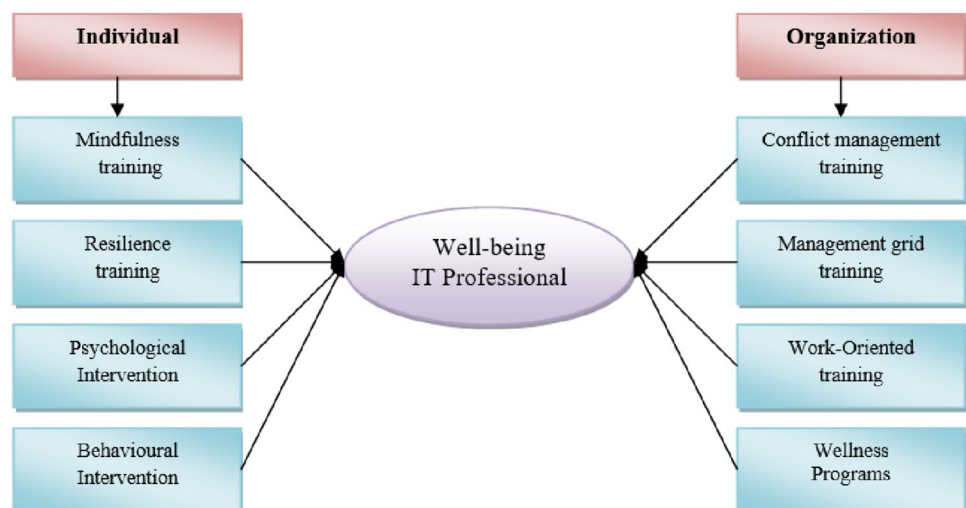
H_1 Mindfulness training programs impact the well-being of IT professionals.

Individuals who engage in mindfulness practices not only have psychological advantages but also advantages at work. A healthy workplace is driven by various factors, such as relationships, creativity, and well-being. Due to a greater understanding of the costs linked to an unhealthy workforce, businesses are investing more in the welfare of their workers. It has been demonstrated that mindfulness training helps employees adapt to challenging circumstances efficiently and has a good impact on burnout, wellness, and stress (Poulin et al. 2008). According to other studies, employees who practice mindfulness have better levels of well-being because they are more emotionally resilient, have a better employment balance, and execute their jobs to a higher standard. Therefore, the effect of a mindfulness training program on the health of IT professionals is examined.

H_2 The resilience training program impacts the well-being of IT professionals.

Well-being depends on resilience and the capacity to handle challenging circumstances. Employees with strong degrees of resiliency will be able to persist and stay engaged and productive during challenging times. By enabling workers to recognize their emotions, amount of stress, and capacity to affect them, contemplation at work can enhance resilience. Positivity about oneself and self-esteem is necessary for well-being (Kelly et al. 2021). It takes resilience to be able to deal with and adjust to

Fig. 1 Proposed research hypothesis framework



changing circumstances, which is directly tied to wellness. So, this research work analyzes the impact of resilience training program on the well-being of IT professionals.

H_3 Psychological intervention impacts the well-being of IT professionals.

Psychological interventions have been reported to be effective in promoting the well-being of employees. There was a fair amount of compiled research on both psychosocial work-environment factors and their links to well-being and mental and physical health issues, as well as on workplace interventions that examined the effects of psychosocial workplace interventions (Selič-Zupančič et al. 2023). Therefore, this research focused on the psychological intervention impacts the well-being of IT professionals.

H_4 Behavioural intervention impacts the well-being of IT professionals.

Routine creation, silent signal implementation, task assignment, and expectation setting are all examples of positive behavior intervention tactics (Ojala et al. 2019). These tactics aid in promoting individuals' good habits while repressing their negative ones. Therefore, the effect of behavioral intention practices on the health of IT professionals is examined.

Organizational Stress Management Intervention.

H_5 Conflict management training programs impact the well-being of IT professionals.

A handling conflict training program involves more than just educating staff members on how to defuse conflicts and developing fundamental interpersonal skills (Kuriakose et al. 2019). Additionally, it stops problems in their tracks so that you may maintain a secure and encouraging workplace. This research examines the conflict management training programs impact the wellbeing of IT professionals.

H_6 The managerial grid training program impacts the well-being of IT professionals.

Through a process called grid training, the managerial grid is utilized to assist managers in analyzing their leadership philosophies (Shanafelt et al. 2023). This is accomplished by giving managers a questionnaire that enables them to assess their level of care for both people and production (Roy 2019). This research determines the managerial grid training program impacts the well-being of IT professionals.

H_7 Work role training programs impact the well-being of IT professionals.

Training that is given in the workplace includes job role training programs. Employees grow used to the working atmosphere they will be a part of during the training. Additionally, workers receive practical training in operating various pieces of machinery, tools, materials, etc. (Berlanda et al. 2020). This research demonstrates that work role training programs impact the well-being of IT professionals.

H_8 The wellness program impacts the well-being of IT professionals.

A wellness program is an all-encompassing health campaign that aims to maintain or enhance well-being through a healthy diet, regular exercise, stress reduction, and sickness avoidance. In addition to boosting productivity, wellness initiatives can promote employee morale and motivation while lowering health risks (Amaya et al. 2019). Employee well-being and corporate performance have a good relationship. Therefore, this research focused on the wellness program's impact on the well-being of IT professionals.

3 Research methodology

3.1 Variable description

The Independent variable is the Well-being of IT professionals, Well-being of IT professionals: The well-being of IT professionals refers to their overall state of health, happiness, and fulfillment in the workplace. It involves a balance between physical, mental, and emotional aspects, ensuring that individuals feel satisfied, motivated, and able to cope with the demands and challenges of their IT roles. Well-being encompasses factors like job satisfaction, work-life balance, stress management, and a positive work environment, ultimately contributing to a healthy and thriving professional life.

The Dependent Variables are,

- *Mindfulness training* Mindfulness training is a practice that involves cultivating a heightened awareness and presence in the current moment, often through meditation and focused attention. It aims to enhance one's ability to observe thoughts and feelings without judgment, fostering a state of calm and improved mental well-being. Mindfulness training involves practices that help IT professionals stay focused on the present moment, reducing stress and improving overall well-being through meditation and heightened awareness (Poulin et al. 2008).
- *Resilience training* Resilience training involves programs and interventions designed to enhance an individual's ability to bounce back from challenges and adversity. It focuses on developing psychological resilience, coping skills, and adaptive strategies to better navigate and cope with stress, setbacks, and pressure in various aspects of life. Resilience training teaches IT professionals how to bounce back from challenges, enhancing their ability to cope with stress and adversity in the workplace (Kelly et al. 2021).
- *Psychological intervention* Psychological intervention refers to therapeutic approaches and strategies designed to address and alleviate mental and emotional chal-

lenges. These interventions, often conducted by trained professionals, aim to improve individuals' psychological well-being, promote mental health, and address specific issues such as anxiety, depression, or stress through various therapeutic techniques and counseling methods. Psychological intervention refers to supportive measures that address mental and emotional well-being, helping IT professionals navigate and overcome psychological challenges they may face (Selič-Zupančič et al. 2023).

- **Behavioural Intervention** Behavioural intervention involves systematic techniques that target and modify observable behaviors. It focuses on encouraging positive behaviors, and reducing undesirable ones, and often employs reinforcement or punishment strategies to bring about behavior change. Behavioral intervention focuses on modifying observable behaviors among IT professionals, encouraging positive habits, and reducing negative ones for improved work performance (Ojala et al. 2019).
- **Conflict Management Training** Conflict management training is a program designed to equip individuals with skills and strategies to effectively handle and resolve conflicts in various settings. It includes communication techniques, negotiation skills, and approaches to promote constructive resolution. Conflict management training equips IT professionals with skills to handle disagreements effectively, fostering a harmonious work environment and minimizing disruptions (Kuriakose et al. 2019).
- **Managerial Grid Training** Managerial grid training is based on the managerial grid model, a leadership theory that assesses leadership styles based on concern for people and concern for production. The training helps individuals understand and enhance their leadership effectiveness by adjusting their leadership style. Managerial grid training teaches IT professionals about different leadership styles and helps them adapt their managerial approach to enhance leadership effectiveness in the IT industry (Shanafelt et al. 2023).
- **Work Role Training** Work role training refers to programs that provide individuals with the necessary skills, knowledge, and tools to excel in their specific roles within an organization. It focuses on job-related competencies and responsibilities to enhance overall performance. Work role training provides IT professionals with specific skills and knowledge needed for their roles, contributing to improved job performance and overall professional development (Berlanda et al. 2020).
- **Wellness Program** A wellness program is a structured initiative aimed at promoting the overall health and well-being of individuals. It typically includes activities and resources that support physical, mental, and emotional health, such as fitness programs, stress management, and preventive health measures. Wellness programs focus on promoting the health and well-being of IT professionals,

incorporating activities and resources that support physical, mental, and emotional wellness in the workplace (Amaya et al. 2019).

3.2 Data collection

250 Questionnaires were given out by the researcher to an appropriate sample of IT experts from various international businesses in Tamil Nadu. The surveys' completion time was supplied to the responders in plenty of time. They weren't obligated to enter their names or the names of their companies. As a result, people could respond without being afraid. 250 questionnaires were issued, and 237 of them were returned and filled out. Despite several attempts, 13 surveys were not successfully returned. The rate of response was therefore 237/250, or 91.33%. Every statement was directed toward the 237 participants who comprised the ultimate sample. Since they were in positions of leadership and could show the staff members how to effectively manage their stress, the organization's managers and supervisors provided the data. The 'missing value approach' was not necessary to use for this investigation because there were no missing values. The timeframe of data gathering was from February to May 2022.

3.2.1 Sampling

The study included both qualitative as well as quantitative approaches. A qualitative descriptive design was utilized to get an accurate description of the issue. To support the investigation, relevant information was obtained from both primary and secondary sources. The core data, that were gathered, were provided by the supervisors and managers of IT organizations. The secondary information for the present study, on the other hand, was acquired from previous studies, journals, publications, papers, and internet resources.

After a thorough examination of the literature, a relevant questionnaire has been created to gather the first-hand information needed to assess the impact of stress on multinational company IT personnel. This survey also investigates the most suitable methods of stress management that are widely used by IT workers both as individuals and as organizations.

3.2.2 Study population

It must be clear from the description of the demographic who is to be included and who is to be left out. The study is limited to Tamil Nadu's top four IT firms, including Cognizant Software and Services, UST International, productEngineering Technologies, and Aspire Systems, which are included in this report. The study's population is determined using the convenience sampling method. Convenience sampling, like unrestricted strata sampling, enables a researcher to select

subgroups by their preferences for filling units within a given stratum. The necessary data from the managers and directors of the four IT companies were chosen.

3.2.3 Demographic summary of respondents analysis

Convenience sampling was used in the current study to gather respondents from four IT firms: Cognizant Technology Services, UST International, Hexaware Solutions, and Aspire Systems. Demographics to identify the facility members who are stressed in the workplace based on their age, geography, gender, employment status, income, and a myriad of other factors. Table 2 shows the demographic profiles of respondents. From Table 2 we can find that out of 237 respondents, 43% of responders were from cognizant technology solutions, 23.2% were from UST Global, 22.4% were from Hexaware Technologies, and 11.4% were from aspire systems. 62.4% were male and the remaining were female candidates. 34.2% of respondents are the managers and 65.8% of respondents are the supervisors of the respective organizations. Also, 36.7% of respondents have 1–2 years of experience in their specific field. 46.4% of IT professionals have 3–4 years of experience and 16.9% of respondents have 5 year or more experience in their respective fields.

3.2.4 Questionnaire survey

A survey questionnaire, inspections, a review of previous research, and analysis were used to collect data. Through the use of surveys, literature reviews, and analyses, new information was obtained for three study topics. The respondents were given survey questionnaires, which included multiple questions intended to elicit information from them. Participants can provide honest answers to the research questionnaire because it is composed of simple questions. Each of the surveys addresses one or more research subproblems.

Table 2 Analysis of Respondent's Demographic Profiles

Factors	Items	Frequency	Percent
Company	Cognizant Technology Solutions	102	43.0
	UST Global	55	23.2
	Hexaware technologies	27	11.4
	Aspire Systems	53	22.4
Gender	Male	148	62.4
	Female	89	37.6
Work role	Manager	81	34.2
	Supervisor	156	65.8
Experience	1–2 yrs	87	36.7
	3–4 yrs	110	46.4
	5 yrs and more	40	16.9

The created questionnaire was distributed to the managers and supervisors of the four selected IT organizations. This survey was created to gain a better understanding of the relationships between a variety of independent and dependent factors.

3.3 Research design

3.3.1 Data tabulation

Microsoft Excel 2019 was used to tabulate the data for this research investigation. Each respondent's responses were entered into the spreadsheet in their row. Thus, 237 respondents' data were entered over a total of 238 rows. The column titles were on the top row.

3.3.2 Data analysis tools

Software called IBM SPSS Statistics 25.0 (Statistical Package for the Social Sciences) was used to conduct the statistical analyses. The AMOS V23 program was then used to do structural equation modeling. The primary analytical technique used in this work, structural equation modeling is especially useful when the variables in a matching dependent relationship become independent. Moreover, descriptive statistics, the F-test, and correlation analysis are used in this study.

4 Data analysis

The descriptive arithmetical evaluation of the information gathered from 237 respondents (management staff and managers) from four IT businesses, including Cognizant Software Solutions, UST International, Hexaware Solutions, and Aspire Systems, is covered in this chapter. The information from each of these groups has helped achieve the goals.

4.1 Analysis descriptions

Data Reliability test Analysing the information that is currently available regarding the data, such as interviewing informed officials and going over paperwork, testing the data, and taking additional actions like tracking down and through source papers, can all be part of an assessment of data dependability.

Percentage analysis By dividing the data by the total number of samples, a percentage relative frequency analysis is performed to characterize the relative frequency of survey replies. Percentage analysis has been used to portray the participants' socioeconomic background and overall demographic profile in the current study.

Measurement Model Analysis Implicit or explicit models that connect the latent variable to its indicators are referred to as measurement models. The first question asks if the latent variable drives the indicators (effect indicators) or if the indications drive the latent variable (causal indicators).

Structural Model Analysis A multivariate statistical analysis method for examining structural links is called structural equation modeling. This method, which examines the structural link between measurable variables and latent constructs, combines multiple regression analysis and component analysis.

F-test The F-test is a parametric method for figuring out how much two or more data groups differ from one another. In the current study, this test was used to determine the main differences in respondents' financial capacities as well as the influence of particular variables on financial service access.

Hypothesis Test In a category of statistical analysis known as hypothesis testing, your presumptions regarding a population parameter are tested. The link between two statistical variables is estimated using it.

4.2 Testing of data reliability

By determining "Cronbach's Alpha" (α), data were submitted to an internal consistency/reliability test for answers linked to individual-level and organization-level stress management methods/ programs used by I.T. employees and I.T. companies separately. It is generally agreed that a value between 0.6 and 0.7 denotes an adequate degree of reliability and a value between 0.8 and larger, is a very good level. However, the α -value for all the factors was in the threshold range, and it was revealed that all the factors were reliable and consistent. The value of Cronbach's alpha, as indicated in Table 3, is presented.

Table 3 Analysis of validity and reliability of measures

Factors	Cronbach's Alpha	No of Items
Stress Intervention Management Technique	0.912	5
Mindfulness Training program	0.659	5
Resilience Training program	0.919	5
Psychological Intervention	0.771	5
Conflict Management Training program	0.845	5
Managerial Grid Training program	0.912	5
Work Role Training program	0.658	5
Wellness Program	0.848	5

4.3 Percentage analysis

Figures 2 and 3 show the questions conducted for collecting the data based on individual-level stress management intervention and organization-level stress management intervention. 43.4% of respondents strongly agree that stress management intervention programs help to maintain a strong as well as healthy work culture. Only 40.03% agree that the intervention program for the reduction of stress leads to enhancing the self-esteem of the employees. 4.2% of employees mentioned that their quality of professional life was not enhanced by the intervention programs conducted by the organizations. 34.6% of employees strongly agree that the intervention programs conducted by the organization help to increase productivity. Totally 22.98% of employees disagreed that the intervention programs increase the attention of employees and reduce employees' distraction. 33.4% of employees strongly agree that mindfulness training program leads to greater job satisfaction of employees. 48.5% and 35.4% of employees strongly agree that their ability to focus on work and level of clarity towards the work is enhanced by the wellness programs conducted in an organization. 26.2% of employee do not build any relationship with their colleagues. Also, 1.7% do not agree that the wellness program will enhance their task performance. 62.2% of employees strongly agree that resilience training program increase their self-awareness. Only 11.6% of employees disagree that the resilience training program enhances personal empowerment. 62.4% of respondents agree that resilience training program helps to manage physical, psychological, and emotional health. 12.08% of respondents strongly disagree that resilience training programs reduce employee absenteeism and increase workplace engagement. 39.8% of employees agree that psychological intervention program helps to protect against negative outcomes. 67% of employees strongly agree that psychological intervention programs produce positive work reflection. Furthermore, only 13% of employees disagree that Psychological intervention programs reduce mental disengagement from work. In addition, 43% and 57% of employees strongly agree that the Psychological intervention program helps to improve work capacity and helps to sustain in difficult situations. 43.98% and 52% of employees strongly agree that behavioral intervention programs support improved morale and effectively minimize negative behaviors. 68.93% of employees strongly agree that the Behavioral intervention program helps to ensure a healthy work environment and nearly 38% of employees disagree with the statement. 62.3% and 52.3% of employees strongly agree that behavioral intervention program helps employees to enhance their management skills and help to stop risky behavior.

31% of respondents strongly agree that a conflict management training program helps to build strong relationships

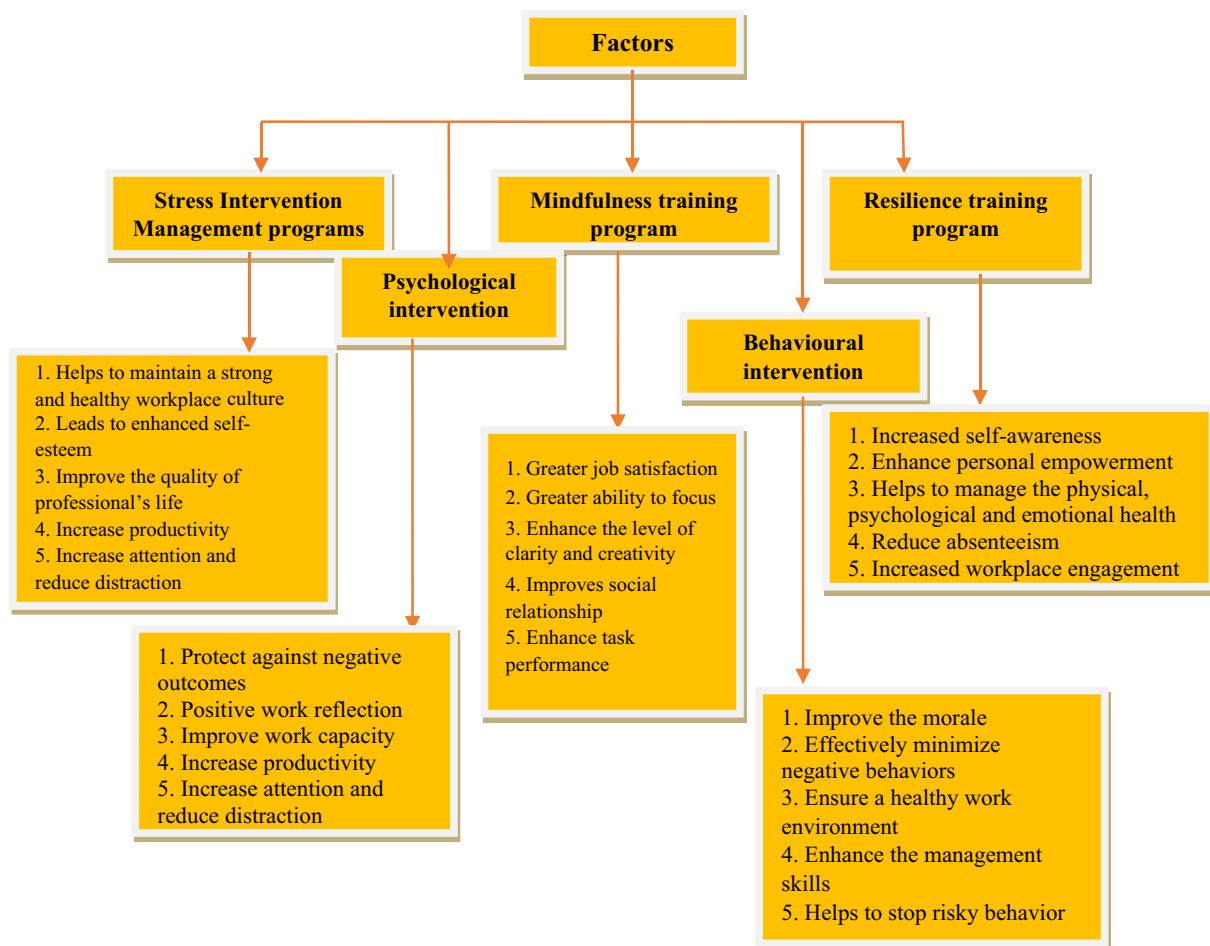


Fig. 2 Percentage analysis of Individual-level stress management

with other employees, and 42% of respondents strongly agree that a conflict management training program helps to demonstrate competency. 45% and 59% of employees strongly agree that conflict management training program helps employees to reduce workplace conflict and help to identify unresolved conflict. 52.10% of employees strongly agree that Conflict management training programs create a smoother working relationship and nearly 17% of employees differ with the statement. 11.62% of employees agree that the managerial grid training program helps to analyze leadership styles and 14.5% of workers strongly differ with the statement. 52% of employees concur that the managerial grid training program motivates the employees to be involved in the decision-making process 65.4% and 53.2% of employees agree that the managerial grid training program. Helps the employees to create a personal development plan and enhance their teamwork. Only 9.1% of employees strongly agree that the managerial grid training program helps to improve their work concerns. 22.35% of employees strongly agree that Work role training programs motivate employees to complete their work before the deadline. In

total, 51.6% and 40.12% of employees agree that the work role training program helps to achieve the target object and improve retention rates. Only 9.13% of respondents agree that a work role training program increases efficiency in the process and helps to rectify errors and mistakes in work. 43.52%, 54.29%, 63.32%, 49.33%, and 67.40% of employees strongly agree that Work role training program helps to lower the risk of illness, improve teamwork, reduce the cost of healthcare, reduce stress, and reduce the risk of diseases.

4.4 Measurement model analysis

In the measurement model analysis, the validity of the data and factors were checked by utilizing extraction of Average Variance (AVE), Heterotrait-Monotrait and Fornell-Larcker criteria, and Fornell-Larcker criteria.

A validity check is then conducted to ascertain the data's reliability. For that, convergent and discriminate validity is employed. Before examining the perimeter of validity, we must examine the mean difference (AVE). Convergence Validity is satisfied if the value of AVE is greater than

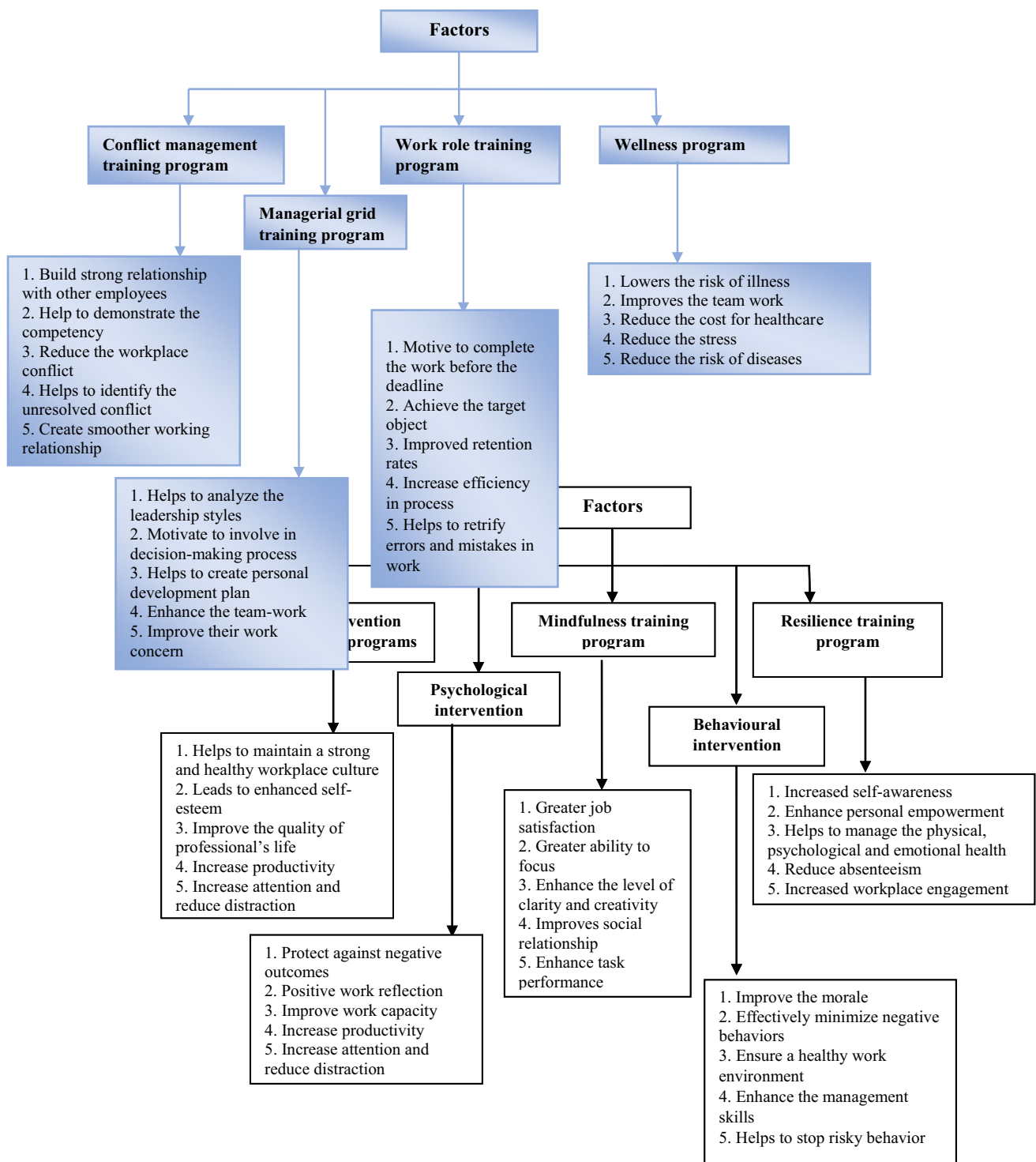


Fig. 3 Percentage analysis of organization-level stress-management intervention program

0.5000 (> 0.5000). In Table 4 it was found that all the AVE values of factors were greater than 0.50 and thus they are valid.

Discriminate validity is the measure’s capacity to successfully distinguish itself from other similar constructs

inside the homological net. We examined the Heterotrait-Monotrait and Fornell-Larcker criteria to assess the discriminatory validity. The affirmation of a measure’s discriminant validity indicates that its fundamental construct is not correlated with any other measure whose design is

Table 4 AVE Analysis of Factors

Factors	AVE
Stress intervention	0.7404
Mindful training	0.5741
Resilience training	0.7550
Psychological training	0.5347
Behavioral intention	0.6272
Conflict management	0.7434
Managerial grid training	0.6130
Work role training	0.5440
Wellness training	0.6356

theoretically unrelated. The HTMT and the Fornell-Larcker Criteria (FLC) were applied in this experiment.

Heterotrait-Monotrait (HTMT) is worn to conclude whether the concept is legal. The median correlations of the HTMT study are presented in Table 5 of this paper. Discriminant Validity is satisfied if the HTMT ratio is significantly smaller than 1. However, in this work, all the factors attain an HTMT ratio lesser than 1 and are valid.

The validity of concepts has been assessed using the Fornell-Larcker criterion. Every measure loads as much as feasible on its related measures since the numerator of each law’s AVE is larger than the connection with another measure. For discriminant validity to be satisfied, the squared

coefficient must be higher than the AVE. Table 6 expresses the criterion and fulfilling construct. If AVE is greater than squared correlations, discriminant validity is satisfied. Because this work met the requirements, all the elements are legitimate and can be used to do additional analysis.

In Table 6, the mean and standard deviation of the questionnaire responses were observed. The signify value describes the traits of the most prevalent reply within the specified dataset. Consequently, no minimum value is essential. The mean range of responses is between 2.0743 and 2.8025. From this, it is concluded that maximum response is received for the factor managerial grid training and minimum response is received for the factor wellness program. From the mean standards in Table 7 below, Since more replies were received for the two factors—enhanced managerial grid training and psychological intervention programs—it is possible to conclude that the stress management intervention program has a beneficial impact on people at work.

4.5 Analysis of structural models

In the structural model analysis, the fitness of the model and factors were checked by utilizing the Tucker and Lewis index and standardized root mean square residual. Also, the path relationship between the factors is found. Moreover, the correlation among the variables was also determined.

Table 5 HTMT Analysis of Factors

Stress intervention	Mindful	Resilience	Psychological	Behavioural	Conflict	Managerial	Work role	Wellness
Mindful	0.7493	0	0	0	0	0	0	0
Resilience	0.9436	0.5824	0	0	0	0	0	0
Psychological	0.8391	0.6349	0.792	0	0	0	0	0
Behavioural	0.7361	0.5104	0.6332	0.9611	0	0	0	0
Conflict	0.6208	0.5804	0.5440	0.5819	0.6353	0	0	0
Managerial	0.6112	0.6443	0.4111	0.4321	0.3602	0.7853	0	0
Work role	0.7311	0.5110	0.5213	0.5693	0.7280	0.578	0.811	0
Wellness	0.8324	0.8010	0.7261	0.3242	0.6201	0.1238	0.3821	0.5831

Table 6 FLC Analysis of Factors

Stress intervention	Mindful	Resilience	Psychological	Behavioural	Conflict	Managerial	Work role	Wellness	FLC criteria
Mindful	0.5331	0.1094	0.2247	0.2461	0.3235	0.1669	0.299	0.0281	Satisfied
Resilience	0	0.2088	0.822	0.1984	0.2434	0.2077	0.0265	0.0117	Satisfied
Psychological	0	0	0.4085	0.3371	0.1708	0.0524	0.3244	0.022	Satisfied
Behavioural	0	0	0	0.5984	0.2396	0.1796	0.0033	0.0029	Satisfied
Conflict	0	0	0	0	0.3531	0.7998	0.021	0.002	Satisfied
Managerial	0	0	0	0	0	0.4623	0.0162	0.0085	Satisfied
Work role	0	0	0	0	0	0	0.0245	0.0020	Satisfied
Wellness	0	0	0	0	0	0	0	0	Satisfied

Table 7 Descriptive data analysis of factors

Factors	N	Mean	Std. Deviation
Stress management	237	2.3713	0.74574
mindful training	237	2.4768	0.77329
resilience training	237	2.3992	0.72615
psychological intervention	237	2.7274	0.68801
conflict management	237	2.4970	0.52902
Managerial grid training	237	2.8025	0.65522
Work role training	237	2.2312	0.62805
wellness program	237	2.0743	0.87074

Table 8 SRMR Fit analysis of composite form and active model

Model	SRMR
Standard measure	0.0560
Complex form	0.0421
Dynamic model	0.0165

Table 9 NFI analysis and TLI analysis of composite form and active model

Model	TLI	NFI
Composite form	0.921	0.925
Active model	0.899	0.910

Then, F-test analysis is performed to find the impact nature between the variables, and finally, hypothesis testing is performed.

The Standard Mean Residual Root Square (SRMR), which is defined as an unvarying modification between the predicted and experienced correlations, is a useful feature of the genuine fit measurement." Additionally, 0.080 is the SRMR threshold value. The baseline model, whose SRMR is slightly above the threshold value at 0.049, was employed in this study to assess the impact of stress management interventions on workers' well-being. The SRMR values of the factor model are 0.0560 and 0.0165, respectively, which are below the threshold value, just like the composite model. Excellent fit was obtained by the factor model for all three models. In Table 8, the SRMR analysis is provided.

TLI analysis: The Tucker–Lewis Index appears to be a gauge of the progressive match-up. TLI values over 0.95 indicate a good basis match. It is measured as less than 0.80, very great fit as 0.90–0.95, and better solution as 0.80–0.90. The NFI and TLI analysis are shown in Table 9.

NFI evaluation: The normalized fit index, which is independent of variable add-up, quantifies the correctness of the fit to the information progressively. Moreover, NFI values over 0.95 indicate a good basis match. Additionally, NFI classifies an accuracy of less than 0.80, a better answer as 0.80–0.90, and a very good fit as 0.90–0.95. The TLI and NFI values that were obtained in this case

Table 10 Analysis of Path Graph on Stress Intervention Training Programs

Stress intervention training programs	R ²	R ² adj
Mindful training	0.0343	0.0274
Resilience training	0.0751	0.0685
Psychological training	0.0432	0.0364
Behavioral intention	0.0539	0.0422
Conflict management	0.0733	0.0707
Managerial grid training	0.0594	0.0526
Work role training	0.0595	0.0528
Wellness training	0.0501	0.0433

are higher and fall between the threshold value of 0.90. Given the value shown in Table 9, the model is therefore regarded as having an excellent match.

In this analysis, stress management and staff well-being programmes were considered nodes. This path graph shows the relationships between the nodes that were previously described. Table 10 displays the path graph analysis.

Table 11 below displays the path matrix for employee well-being. The degree to which IT professionals' stress levels were reduced by mindfulness training, resilience training, mental intervention, behavioral intention, conflict resolution, classic management training, employee job training, and wellness programs was also assessed. The sum for each variable, according to Table 11, is close to 1. The variables are correlated, therefore.

The stress level is decreased and the well-being of participants in the mindfulness training, resilience training, psychology intervention, behavioural intention, conflict management, classic management coaching, work role training, and wellness program for IT professionals is in Table 12.

A correlation analysis was done among the programs for managing stress that help people feel less stressed at work. The results show that stress intervention management programs such as stress intervention management program, mindfulness training, resilience training, psychological intervention, behavioral intention, conflict management, managerial grid training, work role training, and wellness programs are significantly linked to workplace stress reduction and wellbeing of employees at their workplace. If the data is normal, Pearson Correlation is the method used. The range of Pearson coefficients is + 1 to – 1, where + 1 denotes a favorable correlation, – 1 denotes an unfavorable correlation, and 0 denotes no link. Table 13 reveals each connection is statically important. The studies indicate that attained values are non-negative and it is found that there is a strong positive relationship exists between the factors.

Table 11 Path Design Matrix on Stress Intervention

Stress intervention	Mindful	Resilience	Psycho-logical	Behavioural	Conflict	Managerial	Work role	Wellness
Mindful	1	1	1	1	1	1	1	1
Resilience	0	0	0	0	0	0	0	0
Psychological	0	0	0	0	0	0	0	0
Behavioural	0	0	0	0	0	0	0	0
Conflict	0	0	0	0	0	0	0	0
Managerial	0	0	0	0	0	0	0	0
Work role	0	0	0	0	0	0	0	0
Wellness	0	0	0	0	0	0	0	0

Table 12 Summary of coefficient, Circumlocutory effect, and Entirety effect

Factors	Coefficient	Circumlocutory effect	Entirety effect
Stress intervention-> mindfulness	0.7437	0	0.7437
Stress intervention-> resilience	0.3303	0	0.3303
Stress intervention-> psychological training	0.4741	0	0.4741
Stress intervention-> behavioral intention	0.4961	0	0.4961
Stress intervention-> conflict training	0.5687	0	0.5687
Stress intervention-> managerial training	0.4087	0	0.4087
Stress intervention-> work role training	0.1728	0	0.1728
Stress intervention-> wellbeing training	0.7654	0	0.7654

Table 13 Correlation of factors

Training Programs	Mindful	Resilience	Psychological	Behavioral	Conflict	Managerial grid	Work role	Wellbeing
Mindful	Pearson Correlation 1 Sig. (2-tailed)							
Resilience	Pearson Correlation 0.038 Sig. (2-tailed) 0.558	1						
Psychological	Pearson Correlation 0.342** Sig. (2-tailed) 0.000	0.175**	1					
Behavioral	Pearson Correlation 0.220** Sig. (2-tailed) 0.001	0.184**	.926**	1				
Conflict	Pearson Correlation 0.123 Sig. (2-tailed) 0.059	0.131*	0.120	0.214**	1			
Managerial grid	Pearson Correlation 0.009 Sig. (2-tailed) 0.887	0.150*	0.031	0.021	0.121	1		
Work role	Pearson Correlation 0.075 Sig. (2-tailed) 0.252	0.169**	0.038	0.025	0.109	0.261**	1	
Wellness	Pearson Correlation 0.135* Sig. (2-tailed) 0.038	0.151*	.153*	0.051	0.197**	0.054	0.039	1
		0.020	0.018	0.435	0.002	0.412	0.547	

4.5.1 F-test analysis

Table 14 displays the F-test analysis of Individual-Level Stress Management Intervention. Based on the findings of the F-test investigation, we can infer that the average of the

squares between the components meditating education and staff welfare is 13.971 and that the residual across groups is 128.316 (residual error among groups). The ANOVA accounts for the degree of freedom and F ratio, which is $F(1, 16) = 1.497$. Then, 0.05 is chosen as the ANOVA's

Table 14 F-test Analysis of Individual-Level Stress Management Intervention

F-test analysis of hypothesis		Sum of Squares	df	Mean Square	F-ratio	Sig
Mindful training	Between Groups	13.971	16	0.873	1.497	0.102
	Within Groups	128.316	220	0.583		
	Total	142.287	236			
Resilience training	Between Groups	18.535	16	1.158	2.261	0.005
	Within Groups	112.710	220	0.512		
	Total	131.245	236			
Psychological intervention	Between Groups	14.956	16	0.935	1.630	0.063
	Within Groups	126.166	220	0.573		
	Total	141.122	236			
Behavioral intention	Between Groups	18.446	16	1.153	2.393	0.003
	Within Groups	105.994	220	0.482		
	Total	124.440	236			

significant threshold. The hypothesis is accepted when the probability value is less than the significance level. The value of p for the hypothesized hypothesis (H_1 probability) was 0.102, higher than the predetermined value. Therefore, we can say that the employees' welfare is unaffected by the meditation training program. Employee well-being in the workplace and the factors of the resilience training program have a square sum of 18.535. For these variables, the F ratio is determined to be $F(1,16) = 2.261$, and the p -value attained is 0.05, which is equal to the threshold value, is attained, and the substantial value is then acquired.

14.956 is the sum of the square among variables of the mental intervention program and employee satisfaction at work. With these variables, the F -ratio is calculated as $F(1,16) = 1.630$, and the p -value attained is greater than the threshold ($p = 0.063$). So, we can conclude that the mental intervention program has no effect on employees' well-being at work.

The variables behaviour intention program and employee well-being at their place of employment have a sum of squares of 18.446. For these variables, the F -ratio is

calculated as $F(1, 16) = 2.393$ and the value of p is smaller than the entrance value ($p = 0.003$), the significant value is attained. So, we can conclude that the behaviour intention program has an effect on employees' well-being at work.

Table 15 displays the F-test analysis of Organizational-Level Stress Management Intervention. The results of the ANOVA analysis show that RE across the group is 14.546, and the total squares among components managing conflict training and staff wellbeing are 97.148. ANOVA results in a DOF and F -ratio that are calculated as $F(1, 16) = 2.061$. 0.05 is chosen as the ANOVA's significant threshold. The H_1 is established when the resulting prospect value is smaller than the level of significance. The prospect (p) value obtained for the theoretical model is 0.011, which is less than the prearranged value. As a result, the conclusion is managing conflict training programs affects the health of the workforce.

Employee well-being in the workplace and managerial grid training program's squares added together equal 8.179. For these variables, the F ratio is determined to be $F(1, 16) = 1.943$, and after the significant value is obtained the value of p , which is smaller than the threshold value, is

Table 15 F-test analysis of Individual-Level Stress Management Intervention

F-test analysis of hypothesis		Sum of Squares	df	Mean Square	F-ratio	Sig
Conflict management	Between Groups	14.564	16	0.910	2.061	0.011
	Within Groups	97.148	220	0.442		
	Total	111.712	236			
Managerial grid training	Between Groups	8.179	16	0.511	1.943	0.018
	Within Groups	57.869	220	0.263		
	Total	66.048	236			
Work role training	Between Groups	15.226	16	0.952	2.432	0.002
	Within Groups	86.092	220	0.391		
	Total	101.318	236			
Wellness Program	Between Groups	7.784	16	0.487	1.255	0.229
	Within Groups	85.305	220	0.388		
	Total	93.089	236			

reached. Thus, we can conclude that classic management training programs have an effect on employees’ well-being at work.

The square sum of the factors of the work role training program and employee well-being at their place of employment is 15.226. For these variables, the F ratio is determined to be $F(1,16) = 2.432$, and the value of p is 0.002 which is lesser than the threshold value, and the significant value is reached. So, we can conclude that the job role training program has an impact on employees’ well-being at work.

The product of the squares between both the variables of employee well-being at work and wellness training program is 7.784. For these variables, the F ratio is determined to be $F(1, 16) = 1.255$, and the value of p is 0.229 is higher than the entrance value, the significant value is attained. So, we can conclude that the well-being training program has no effect on employees’ well-being at work.

4.5.2 Hypothesis testing

The hypothesis is tested, as shown in Table 16. Testing was done on materialism’s ability to mediate between the eight criteria. The results indicate that the mindfulness training program affects IT professionals’ well-being ($p = 0.011$). The impact of the resilience training program on the well-being of IT professionals is acknowledged at the 5% confidence level ($p = 0.018$). The impact of psychological intervention on the well-being of IT professionals is acknowledged at the 5% confidence level ($p = 0.002$). The recognized confidence level is 5%. The well-being of IT professionals is impacted by the behavioral intervention ($p = 0.229$). Conflict management training programs impacting IT professionals’ well-being ($p = 0.102$) cannot be accepted with no confidence level due to their high significant value. IT professionals’ well-being is impacted by the managerial grid training program ($p = 0.005$), with 5% of respondents accepting this conclusion. Because of the high significant value that was rejected, work role training programs have an impact on the well-being of IT professionals ($p = 0.063$) with no confidence level. IT professionals’ well-being is impacted

by wellness programs ($p = 0.003$); this is acknowledged at the 5% confidence level.

4.6 Discussion

Finding stress management techniques that have an impact on the IT environment is the study’s main goal. The results of the study provide useful approaches for stress management in the IT sector and show how stress management can either positively or negatively affect performance. This study supports the idea of recognizing the many stressors in our surroundings and the strategies and tools available to manage them. This research shows that depending on how much stress affects a person’s capacity to perform their job, it can have both positive and negative impacts. The study findings indicate that mindfulness training, resilience training, psychological interventions, managerial grid training, and wellness programs program have a statistically significant impact on the well-being of IT professionals, with p -values of 0.011, 0.018, 0.002, 0.005, and 0.003 respectively, all accepted at a 5% confidence level (Poulin et al. 2008; Kelly et al. 2021; Selič-Zupančič et al. 2023; Roy 2019; Amaya et al. 2019). Conversely, the behavioral intervention, conflict management training program, and work role training programs showed non-significant impacts on IT professionals’ well-being, as evidenced by p -values of 0.229, 0.102, and 0.063, respectively, leading to their rejection without a specified confidence level due to high significant values (Ojala et al. 2019; Kuriakose et al. 2019; Berlanda et al. 2020).

5 Conclusion

5.1 Managerial implications

Workplace stress is a difficult problem to deal with in the current context for IT professionals. It is impractical or impossible to entirely eradicate stress at work. Workplace stress is caused by a variety of reasons, including pay, peer relationships, workload, low engagement, etc. Additionally,

Table 16 Hypothesis Testing

Hypothesis	Significant value	Confidence
H1: Mindfulness training programs impact the well-being of IT professionals	0.011	5%
H2: Resilience training programs impact the well-being of IT professionals	0.018	5%
H3: Psychological intervention impacts the well-being of IT professionals	0.002	5%
H4: Behavioural intervention impacts the well-being of IT professionals	0.229	–
H5: Conflict management training programs impact the well-being of IT professionals	0.102	–
H6: Managerial grid training programs impact the well-being of IT professionals	0.005	5%
H7: Work role training programs impact the well-being of IT professionals	0.063	–
H8: Wellness programs impact the well-being of IT professionals	0.003	5%

stress-producing circumstances or events may not be experienced by everyone. This demonstrates that how well an employee handles problems also determines the pressures in their life.

Based on their priority, the management must address each source of stress separately to provide amore developedeconomy. By promoting ideas and opinions in the workplace, managers should also put a lot of effort into developing a participative work atmosphere. In addition, the management should put more emphasis on initiatives like training for IT-related skills.

The management can address this problem by setting up more and more personality development programs so that people will favor a problem-focused coping strategy that is more efficient in the current professional workplace.

5.2 Recommendations for further investigating

These findings demonstrate that specific workers can be taught stress-reduction and strain-relief procedures. Additionally, almost every subcategory of intervention had positive outcomes. During the research, various concepts were discovered. The suggestions we make for additional research are. We also believe that it would be preferable to take into account a sizable workforce for future research. An analysis of the relationship between the stress levels of IT professionals and their mindfulness is required. Their ability to lower stress levels at the organization is enhanced by incorporating access to sufficient data.

5.3 Limitations of the study

The research has been done on an extremely small sample size was used, along with a relatively short period. Even though, we made a huge effort to include individuals with a variety of areas of expertise. Not every representative from every department and area was included in our study. However, the information we acquired improved our work and enabled us to look at stress management intervention strategies in light of our study objective. Finally, we would like to mention the existence of several contradictory studies, such as the use of insufficient data related to the purpose of the research, the exclusion of crucial information, and also the use of a small number of references to the study, decreased our reliance on all studies of various kinds published on various websites. Regarding fact, it constricts our vision to the utilization of every second-hand piece of unreliable information.

5.4 Conclusion

The objective of the conducted empirical study is to ascertain how stress management intervention programs affect the

health of IT workers in the workplace. The focus of the study was stress administration intervention techniques like mindfulness training, resilience training, psychological intervention programs, behavioral intervention programs, conflict management training, managerial grid training, work role training, and wellness programs. There are two components to this work. The data collection starts inthe first section. With the hypothesized theory in mind, the questionnaire was created. With the information gathered, analyses including SEM and F-test were carried out in the second stage. Finally, it is important to take into account the structural effects of research, like thesize effect and the cost-effectiveness of treatments.

Acknowledgements I would like to express my very great appreciation to the co-authors of this manuscript for their valuable and constructive suggestions during the planning and development of this research work.

Author contribution All authors have made substantial contributions to the conception and design, revising the manuscript, and the final approval of the version to be published. Also, all authors agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Funding This research did not receive any specific funding.

Data availability The proposed approach was implemented in two stages. The first step began with data collection where the data were collected from 142 supervisors and managers of the selected four IT companies by providing a questionnaire with a set of 40 questions. The research was primarily focused on stress management interventions like mindfulness training programs, resilience training programs, psychological interventions, behavioural interventions, conflict management training programs, managerial grid training programs, work role training programs, and wellness programs.

Declarations

Conflict of interest The authors declare no conflict of interest.

Ethical approval Not Applicable.

Informed consent Not Applicable.

References

- Akerstrom M, Corin L, Severin J, Jonsdottir IH, Björk L (2021) Can working conditions and employees' mental health be improved via job stress interventions designed and implemented by line managers and human resources on an operational level? *Int J Environ Res Public Health* 18(4):1916
- Amaya M, Donegan T, Conner D, Edwards J, Gipson C (2019) Creating a culture of wellness: a call to action for higher education,

- igniting change in academic institutions. *Build Healthy Acad Communities* 3(2)
- Armaou M, Konstantinidis S, Blake H (2020) The effectiveness of digital interventions for psychological well-being in the workplace: a systematic review protocol. *Int J Environ Res Public Health* 17(1):255
- Badu E, O'Brien AP, Mitchell R, Rubin M, James C, McNeil K, Nguyen K, Giles M (2020) Workplace stress and resilience in the Australian nursing workforce: a comprehensive integrative review. *Int J Ment Health Nurs* 29(1):5–34
- Berlanda S, de Cordova F, Fraizzoli M, Pedrazza M (2020) Risk and protective factors of well-being among healthcare staff. A thematic analysis. *Int J Environ Res Public Health* 17(18):6651
- Bhui K, Dinos S, Galant-Miecznikowska M, de Jongh B, Stansfeld S (2016) Perceptions of work stress cause and effective interventions in employees working in public, private and non-governmental organizations: a qualitative study. *Bjpsych Bull* 40(6):318–325
- Carolan S, Harris P, Cavanagh K (2017) Improving employee well-being and effectiveness: systematic review and meta-analysis of web-based psychological interventions delivered in the workplace. *J Med Internet Res* 19:e271
- Chin B, Slutsky J, Raye J, Creswell JD (2019) Mindfulness training reduces stress at work: a randomized controlled trial. *Mindfulness* 10(4):627–638
- Daniels K, Fida R, Stepanek M, Gendronneau C (2021) Do multi-component workplace health and wellbeing programs predict changes in health and wellbeing? *Int J Environ Res Public Health* 18(17):8964
- Dhayalan V, Seethalakshmi M, Nimalathasan B (2021) A study and analysis of work stress management among software employees. *Ilkogretim Online*, vol 20 No. 1, pp 4867–4874. <https://doi.org/10.17051/ilkonline.2021.01.522>
- Eby LT, Allen TD, Conley KM, Williamson RL, Henderson TG, Mancini VS (2019) Mindfulness-based training interventions for employees: a qualitative review of the literature. *Hum Resour Manag Rev* 29(2):156–178
- Giga SI, Cooper CL, Faragher B (2003) The development of a framework for a comprehensive approach to stress management interventions at work. *Int J Stress Manag* 10(4):280
- Havermans BM, Brouwers EP, Hoek RJ, Anema JR, van der Beek AJ, Boot CR (2018) Work stress prevention needs of employees and supervisors. *BMC Public Health* 18(1):1–11
- Holman D, Johnson S, O'Connor E (2018) Stress management interventions: improving subjective psychological well-being in the workplace. In: *Handbook of well-being*. DEF Publishers
- Kelly F, Uys M, Bezuidenhout D, Mullane SL, Bristol C (2021) Improving healthcare worker resilience and well-being during COVID-19 using a self-directed e-learning intervention. *Front Psychol* 12:748133
- Kriakous SA, Elliott KA, Lamers C, Owen R (2021) The effectiveness of mindfulness-based stress reduction on the psychological functioning of healthcare professionals: a systematic review. *Mindfulness* 12(1):1–28
- Kuriakose V, Jose H, Anusree MR, Jose S (2019) Process conflict and employee well-being: an application of activity reduces conflict associated strain (ARCAS) model. *Int J Confl Manag* 30(4):462–489
- Lagrosen S, Lagrosen Y (2022) Workplace stress and health—the connection to quality management. *Total Qual Manag Bus Excell* 33(1–2):113–126
- Landsbergis PA (2018) Interventions to reduce job stress and improve work organization and worker health. In: *Unhealthy work*. Routledge, pp 193–209
- Michie S, Yardley L, West R, Patrick K, Greaves F (2017) Developing and evaluating digital interventions to promote behaviour change in health and health care: recommendations resulting from an international workshop. *J Med Internet Res* 19:e232
- Mihalits DS, Schiller B, Barrech A, Riedel N, Li J, Angerer P, Gündel H, Mörtl K (2021) The flipside of work engagement: a qualitative evaluation of a stress management intervention in the workplace. *Hum Arenas* 1–15.
- Ojala B, Nygård CH, Huhtala H, Bohle P, Nikkari ST (2019) A cognitive behavioral intervention program to improve psychological well-being. *Int J Environ Res Public Health* 16(1):80
- OommenJoshay C (2014) Analysis of stress and stress management interventions among employees in the information technology (IT) sector in India and Ireland. Doctoral dissertation, Dublin Business School
- Poulin PA, Mackenzie CS, Soloway G, Karayolas E (2008) Mindfulness training as an evidenced-based approach to reducing stress and promoting well-being among human services professionals. *Int J Health Promot Educ* 46(2):72–80
- Richardson KM, Rothstein HR (2008) Effects of occupational stress management intervention programs: a meta-analysis. *J Occup Health Psychol* 13(1):69
- Riva S, Chinyio E (2018) Stress factors and stress management interventions: the heuristic of “bottom-up” an update from a systematic review. *Occup Health Sci* 2(2):127–155
- Roy D (2019) Managerial grid in macroeconomic perspective: an empirical study (2008–2017). *J Transnatl Manag* 24(3):165–184
- Selič-Zupančič P, Klemenc-Ketiš Z, OnukTement S (2023) The impact of psychological interventions with elements of mindfulness on burnout and well-being in healthcare professionals: a systematic review. *J Multidiscip Healthc* 1821–1831
- Shanafelt TD, Larson D, Bohman B, Roberts R, Trockel M, Weinlander E, Springer J, Wang H, Stolz S, Murphy D (2023) Organization-wide approaches to foster effective unit-level efforts to improve clinician well-being. In *Mayo clinic proceedings*, vol 98, No. 1. Elsevier, pp 163–180
- Strauss C, Gu J, Pitman N, Chapman C, Kuyken W, Whittington A (2018) Evaluation of mindfulness-based cognitive therapy for life and a cognitive behavioral therapy stress-management workshop to improve healthcare staff stress: study protocol for two randomized controlled trials. *Trials* 19:1–10
- Subha B, Madhusudhanan R, Thomas AA (2021) An investigation of the impact of occupational stress on mental health of remote working women IT professionals in urban Bangalore, India. *J Int Women's Stud* 22(6):139–149
- Talati Z, Grapes C, Davey E, Shilton T, Pettigrew S (2021) Predictors of uptake of general and tailored services to improve employee health and wellbeing. *Health Promot J Austr* 32(3):548–553
- Verweij H, van Ravesteijn H, van Hooff ML, Lagro-Janssen AL, Speckens AE (2018) Mindfulness-based stress reduction for residents: a randomized controlled trial. *J Gen Intern Med* 33(4):429–436
- Vonderlin R, Biermann M, Bohus M, Lyssenko L (2020) Mindfulness-based programs in the workplace: a meta-analysis of randomized controlled trials. *Mindfulness* 11(7):1579–1598
- Warrier U, Foroapon C, Chehimi M (2022) Examining the influence of mindfulness on organizational role stress (ORS): a monitor acceptance theory perspective. *Int J Manpow* 43(2):448–462. <https://doi.org/10.1108/ijm-02-2021-0067>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor (e.g. a society or other partner) holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.