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Review article

Workplace Risks for IT Professionals Associated with Barriers to Healthy Behavior: A Review of International Research in the Context of the Healthy Workplace Model

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Abstract. In today's information society, where IT professionals play a central role, their work, despite its apparent safety, carries specific and not always obvious health risks. The importance of studying these risks is determined by their direct impact on labor producitvity, health and well-being. The purpose of this study is to review and summarize international scientific data on the workplace risks for IT professionals in the context of the WHO Healthy Workplace Model (HWM), as well as to outline a basis for developing a questionnaire to assess organizational-level barriers to healthy behavior. For this purpose, a PRISMA-ScR-compliant scoping review was performed along with a search in Scopus, WoS, PsycINFO, PubMed, and Google Scholar, followed by a targeted screening of reference lists and citation searches. The P-E-O-S criteria included: IT professionals (P, Population); workplace risks as potential causes of barriers to healthy behavior (E, Exposure/Context); health/well-being outcomes (O, Outcomes); and empirical quantitative, qualitative and mixed-methods studies in English (S, Study Design). Of the more than 500 sources identified, 45 publications were included in the final review. The results have shown that IT professionals face a complex set of risks, despite the formal absence of harmful workplace factors. These risks include physical (musculoskeletal diseases, vision problems, metabolic and cardiovascular disorders) and psychosocial (stress, burnout, poor work-life balance) issues. The physical risks are caused by prolonged sitting, lack of physical activity, and poor workplace ergonomics. The psychosocial risks are associated with high workload, tight deadlines, and blurred digital boundaries. Personal health resources of employees are dual in nature: they depend on corporate health and wellness programs, on the one hand, and on their subjective attitudes toward their own health and overall lifestyle, on the other. Research on the impact of enterprise community involvement on the health and well-being of IT employees remains limited. Distinguishing between workplace risks and barriers to healthy behavior allows for the identification of manageable working conditions as key preventative targets. Using the HWM model, it is possible to make a comprehensive analysis of health risks among IT professionals, providing a deeper understanding of the causes for barriers to healthy behavior in this professional group and creating a substantive basis for questionnaire development.

Key words: IT professionals, healthy workplace, occupational health, workplace risks, physical work environment, psychosocial work environment, personal health resources, enterprise community involvement, barriers to healthy behavior

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Introduction

In today's world, information technology (IT) professionals play a key role in the development of business, the economy, and society as a whole. Despite the absence of traditional occupational hazards, workplace health risks associated with professional activities are becoming increasingly relevant. Consequently, maintaining the occupational health of IT professionals is gaining high scientific and practical significance due to its direct impact on work efficiency and productivity. For instance, studies highlight a correlation between optimizing employees' healthy lifestyles and increasing their efficiency (Saraç et al., 2023). Creating a work environment conducive to mental health brings significant benefits to both employees (reduced absenteeism, increased engagement) and organizations (increased productivity) (Harvey et al., 2014). Healthy employees demonstrate higher motivation, concentration, and job satisfaction, which, in turn, contributes to decreased sick leave rates and increased overall productivity (Chang, 2024).

However, there is currently a contradiction between the accumulated empirical data on occupational risks for IT professionals and the limited integration of this data into models for creating an optimal job design. Studies often conflate work environment characteristics (workplace risks) and personalized obstacles to maintaining healthy practices (barriers to healthy behavior), making it difficult to compare results and develop organizational preventive measures.

This review is based on the World Health Organization (WHO) Healthy Workplace Model (HWM)[1], which offers a comprehensive approach to creating and maintaining a supportive environment for employee health and well-being. This model has evolved from a primary focus on occupational health and safety to the integration of work organization, workplace culture, lifestyle, and the social environment, which have a complex impact on employee health. The modern interpretation of the HWM incorporates both protective measures and health promotion strategies (Stoewen, 2016). It emphasizes the importance of not only working conditions and organizational culture but also employees' personal health resources, a significant aspect of which is their psychological attitude toward health and awareness of factors hindering its maintenance. For instance, sleep deficiency, professional burnout, and overall health are interconnected, as confirmed by research across various professional groups (Stewart & Arora, 2019). A growing body of scientific evidence points to the critical role of nutrition not only for

[1] World Health Organization & Burton, J. (2010). *WHO healthy workplace framework and model: Background and supporting literature and practices*. World Health Organization. Retrieved 12 August, 2025, from: https://iris.who.int/handle/10665/113144

physiological processes but also for emotional state and mental well-being (Muscaritoli, 2021). Furthermore, there is empirical evidence that a sedentary lifestyle significantly contributes to the development of occupational stress, with physical activity levels acting as an important mediating factor in this relationship (Clinchamps et al., 2024). The WHO emphasizes the inextricable link between mental and physical health, recognizing both as essential for effective stress management, productive work, and making a positive contribution to the work environment (Chang, 2024). The choice of this model as the conceptual framework for this review is motivated by several factors. First, health and well-being issues (including those related to the IT sector) have been studied in international scientific discourse much earlier, allowing for the accumulation of more data. Second, the current state of Russian research in occupational psychology is characterized by a certain fragmentation: often only isolated factors of well-being are analyzed, while a holistic understanding of health and the barriers to healthy behavior among organizational employees remains insufficiently developed.

The purpose of this study was to review and summarize international scientific data on the workplace risks for IT professionals within the framework of the HWM, as well as to outline a basis for developing a questionnaire to assess organizational-level barriers to healthy behavior.

Methods

This study was a scoping review in compliance with the PRISMA-ScR (2018) reporting guidelines. A systematic literature search was conducted across the following databases: Scopus, Web of Science (WoS), PsycINFO, PubMed, and Google Scholar. These databases were selected as the most representative for psychological research. In addition, a targeted manual search of reference lists from relevant reviews and key articles was made. The date of the final search was September 14, 2025.

The research question and inclusion criteria were formulated using the P-E-O-S framework. The Inclusion/Exclusion criteria were: P (Population): IT professionals (developers, testers, analysts, DevOps, etc.) working in the office, remotely, or in a hybrid format; E (Exposure/Context): workplace risks and job design characteristics categorized by the HWM domains, the conditions for their potential "transition" into barriers to healthy behavior were analyzed during the thematic synthesis stage; O (Outcomes): health and well-being indicators, as well as data on behaviors/conditions affecting sleep, breaks, physical activity, nutrition, and help-seeking; and S (Study Design): empirical studies in English (quantitative, qualitative, and mixed-methods) published in peer-reviewed journals. Articles not related to the IT population and publications without empirical data (opinion pieces, editorials, short communications) were excluded.

The search strategy was adapted for each database using the Title/Abstract/Keywords fields. Examples of key search strings are given below:

– *Subject of labor*: "IT professionals" OR "software developers" OR "software engineers" OR "computer programmers";

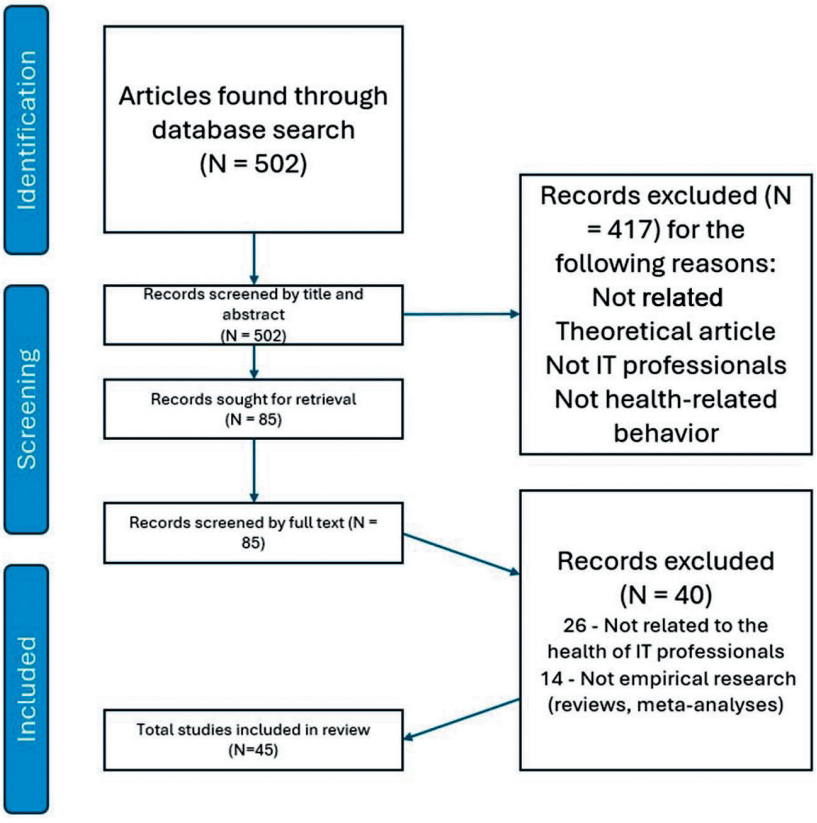
– *Physical work environment*: "ergonomics", "sedentary behavior", "computer vision syndrome", etc.;

– *Psychosocial work environment*: "technostress", "job satisfaction", "organizational commitment", "psychosocial safety climate", etc.;

– *Personal health resources*: "self-care", "physical activity", "nutrition", "coping strategies", etc.;

– *Enterprise community involvement*: "corporate social responsibility", "employee volunteerism", "community health", etc.

Over 500 articles were initially identified. After duplicates were removed and an initial screening of titles and abstracts was conducted, 85 publications were selected for a more detailed assessment. Ultimately, 45 articles were included in the review. Their full texts were obtained from open-access sources, the university library collection, or directly from the first author. Forty articles were excluded for the following reasons: 26 were not directly related to the health of IT professionals, and 14 were not empirical studies but rather reviews or meta-analyses. The search and selection process is presented in Figure.



Flowchart illustrating the process of selecting studies for the review

Source: prepared by Elena Shumeiko using PRISMA Flow Diagram (https://www.prisma-statement.org/prisma-2020-flow-diagram)

Data extraction was performed by a single researcher using a pre-developed data charting form. In cases of disagreement (ambiguity in categorizing a factor into HWM domains or interpreting influence mechanisms), the issues were discussed

with other members of the research team until consensus was reached; when necessary, coding rules were refined and applied to the entire set of included publications.

The results were synthesized by thematically coding the identified factors and then grouping them according to the HWM components. This process involved identifying conditions under which workplace risks might manifest as barriers to healthy behavior (*e.g.*, displacement of restorative practices, lack of time and resources, normative constraints, *etc.*). In cases of discrepancies in the categorization of factors by the HWM components, decisions were made through discussion and consensus.

Results

The HWM encompasses four key interconnected domains: the physical work environment, the psychosocial work environment, personal health resources, and enterprise community involvement. A detailed analysis of each domain makes it possible to identify potential workplace risks specific to the activities of IT professionals and hypothesize the conditions under which these risks may transform into personalized barriers to healthy behavior, i.e., obstacles that reduce the likelihood of regularly engaging in health-promoting activities.

***The physical work environment*,** which includes the tangible components of the workspace (building, equipment, raw materials, technological processes, and transport systems), has a direct impact on the physical and mental state of workers, serving as a significant factor underlying occupational injuries and mortality. An analysis of the physical work environment makes it possible to identify potential hazards of various types, classified as chemical, physical, biological, ergonomic, mechanical, energy, and transportation-related ones.

Despite the absence of hazardous and dangerous working conditions in the traditional sense, IT work is associated with significant health risks determined by the specific nature of the profession. IT professionals often work 8–10 hours a day, and during periods of intensive development or tight deadlines, this time can increase substantially, reaching 50 or more hours per week (Lalloo et al., 2021). This work requires high cognitive load and concentration, which, combined with forced postures and repetitive movements (e.g., when a keyboard and a mouse are used), creates specific risks to physical health. Research shows that a sedentary lifestyle poses a significantly higher occupational risk for IT professionals compared to other groups of employees (Lalloo et al., 2021). Furthermore, the authors of this study emphasize that IT professionals not only spend more time sitting at the workplace but also, more often than representatives of other professions, spend their free time engaging in sedentary activities outside of work, such as watching television or playing video games. This exacerbates health risks and contributes to the development of chronic diseases. It is also noted that IT professionals spend more time in front of computer screens outside of work (Lalloo et al., 2021). The most common problems identified for IT professionals are described below.

***Musculoskeletal disorders (MSDs)*:** their prevalence ranges from 20% to 89%, with the main problem areas being the neck, lower back, upper back, and shoulders (Padma et al., 2015; Prasetya et al., 2024). According to a study by Alghadir et al. (2022) conducted in Saudi Arabia, 32% of 202 IT professionals surveyed reported experiencing musculoskeletal pain after starting their professional careers. Of these, 61% had to seek medical treatment, and 23% rated their worst pain episode as 7 or higher on a 10-point scale. Women were more susceptible to these issues: 67% reported work-related pain. The study also noted that such pain could impact daily activities and even force professionals to change jobs or reduce their working hours. A study by Hasanat et al. (2017) conducted in Pakistan found that 26.5% of 185 software engineers surveyed suffered from neck pain at the time of the survey, while 64.32% had experienced this problem in the past. Significant risk factors included physical inactivity, uncomfortable workstations, work-related mental strain, and lack of sleep. A study by Prasetya et al. (2024), conducted among 150 Indonesian IT professionals, showed that the highest levels of discomfort and risk of developing musculoskeletal disorders was observed in the neck area, followed by the lower back, right shoulder, and upper back. Factors significantly influencing these disorders included the screen time, night shifts, as well as the quality of the chair (backrest) and the use of the mouse. A study by Pattath (2025) identified various strategies used by professionals to minimize the risks of MSDs. These strategies included individual awareness of proper posture and behavior during work, attention to workstation ergonomics, and proactive risk reduction approaches. The authors emphasize that the participants' narratives demonstrated the importance of employee autonomy in identifying and applying these strategies, as well as the need to discuss these issues with management. Raju et al. (2024) found that musculoskeletal pain was widespread among Indian IT professionals: 77% of 200 respondents reported such pain in the past year. Furthermore, 72% of the participants experienced effort-reward imbalance (ERI), which showed a strong, statistically significant correlation with pain severity. Moreover, the likelihood of experiencing musculoskeletal pain were 3.2 times higher among professionals with ERI compared to those without it. Finally, a study by Vinod et al. (2015), which involved 400 Indian IT professionals, identified low back pain as the most common problem, followed by spinal issues.

***Vision problems*.** According to a study by Zayed et al. (2021), the prevalence of digital eye strain among IT professionals in Egypt was 82%. The most common symptoms were headache (81%), burning eyes (75%), and blurred vision (70%). Several factors increasing the risk of digital eye strain were identified, including: female gender, age over 35, computer use for more than 6 hours per day, work experience of more than 10 years, and wearing corrective glasses, as well as ergonomic and environmental factors such as placing the monitor closer than 20 inches, lack of an anti-glare screen, inadequate brightness, lack of work breaks, exposure to polluted or windy air, and the use of air conditioning. A similar study by Jayakumar et al. (2020), conducted among 300 Indian IT professionals, showed that 67% had at least one symptom of computer vision syndrome, with the most common being dry eyes (96%), eye strain (94%), and redness/itching (86%).

Although 84% of the participants were aware of the syndrome, only 51% sought professional help.

Gastrointestinal problems and metabolic disorders. A study by Banerjee et al. (2023) confirmed that a sedentary lifestyle, high stress levels, and irregular eating habits could contribute to the development of problems such as gastritis, irritable bowel syndrome (IBS), and metabolic disorders. A study by Natarajan et al. (2025) of 250 Indian IT professionals found that 36% of them suffered from non-alcoholic fatty acid liver disease (NAFLD). A sedentary lifestyle was identified as an independent risk factor for NAFLD, highlighting the need for regular screening and lifestyle modification strategies.

Cardiovascular disorders. The negative factors that IT professionals are exposed to, listed in the above-mentioned study (Banerjee et al., 2023), may also increase the risk of developing hypertension, atherosclerosis, and other cardiovascular diseases.

The specific nature of IT professionals' work allowed us to identify the following workplace health risks.

Prolonged sitting and physical inactivity. Physical inactivity is recognized as the fourth leading risk factor for global mortality (Lalloo et al., 2021). The sedentary nature of work in the IT sector is not merely a lifestyle choice but an inherent occupational hazard that significantly contributes to the development of chronic diseases.

Ergonomic issues. Insufficient awareness and practice of computer ergonomics lead to a high prevalence of musculoskeletal problems and eye strain among IT professionals (Pukur et al., 2024; Jasmine et al., 2020). Research shows that a significant number (64%) of IT professionals learn about ergonomics only after they have already experienced health problems, such as muscle pain or vision disorders (Pukur et al., 2024). A study by Stincel et al. (2023), conducted among young IT professionals, confirmed these concerns. It found a mild degree of neck posture disorders and the presence of forward head posture, which intensified with age and increased work experience. A direct correlation was established between neck disorders, inadequate workstation ergonomics, and physical activity levels. Furthermore, a study by Jayanandana et al. (2023) demonstrated that the physical work environment, including ergonomics, had a significant positive impact on the productivity of IT professionals working from home.

***The psychosocial work environment*,** which encompasses an individual's interactions with psychological and social factors in the workplace, such as the psychological climate in the team, management style and corporate culture, has a significant impact on employee well-being. Problems in this environment, including poor work organization (unclear tasks, time pressure, lack of support), negative culture (disrespect, bullying, discrimination), ineffective management, work-life imbalance, and fear of job loss, are key sources of psychosocial risks.

The IT sector is associated with specific professional risks that have a significant impact on the psychosocial work environment.

Excessive workload and its consequences: High workload, labor intensity, and tight deadlines are among the most significant psychosocial risks in the IT

industry (Anthony-McMann et al., 2017). A study by Gren (2025), conducted in Austria, showed that managers in the IT sector had less control over workloads and their influence on them, which created management challenges. Furthermore, a gender analysis revealed that female managers reported more workplace conflicts compared to their male counterparts. A study by Sunanda (2018) revealed a strong positive correlation between role stressors (such as role overload, role underload, and role ambiguity) and professional stress among IT employees. The author emphasized that organizations should take measures to mitigate these stressors.

Stress and burnout: Occupational burnout among IT professionals is associated with an increased risk of physical, mental, and behavioral disorders (Zaza et al., 2022; Padma et al., 2015). Furthermore, negative emotional states are negatively correlated with cognitive abilities and motivation (Singh & Sharma, 2017; Graziotin et al., 2018). A study by Babu et al. (2015), based on in-depth interviews with 32 professionals, identified nine primary domains of stress: job control, autonomy, time pressure, night shifts, income, recognition, physical environment, work environment, and affective/emotional factors. These factors influence both employee health and corporate HR policies. A study by Wong et al. (2023) confirmed that software engineers demonstrated higher rates of burnout and suicide compared to many other "infosphere" workers. The authors concluded that mental well-being support should be integrated at the individual, team, and organizational levels, as well as within the technologies used by employees in their work. A study by Ramesh et al. (2016), conducted among 149 IT professionals, found that, although stress levels did not require immediate intervention, insomnia was the most common symptom. The authors pointed to the necessity of implementing various stress management techniques. A study by Zadow et al. (2023), conducted among software engineers, demonstrated that a psychosocial safety environment that promotes employee psychological health was a vital factor. It was positively associated with work engagement, which, in turn, promoted creativity and productivity. A study by Trivedi et al. (2024) of 356 IT professionals in India during the COVID-19 pandemic found that the prevalence of occupational stress was 17%. Higher rates were observed among women, employees over 31 years old, and those with 4 to 7 years of experience. Over 80% of the respondents identified factors such as deadline pressure, long working hours, the need for multitasking, and difficulties in maintaining work-life balance. A similar study by Russo et al. (2021) also confirmed that stress negatively affected well-being, while factors such as boredom and distractions negatively correlated with productivity. However, the quality of social contacts had a positive impact on well-being.

Work-life imbalance and blurred boundaries: The lack of work-life balance can lead to serious negative consequences, such as decreased productivity and creativity, as well as increased employee turnover (Weerarathna et al., 2022). A study by Smite et al. (2022) described in detail the so-called "flexibility traps" and the difficulties of remote communication. The authors noted that the perceived freedom of remote work could often lead to a blurring of the boundaries between personal life and work, and, as a consequence, increase working hours and reduce the ability to "disconnect" from tasks. A study by Subha et al. (2021) found that

prolonged remote work during the COVID-19 pandemic negatively impacted the mental health of female IT professionals in Bangalore. Factors such as workload, job insecurity, poor work environment, and personal issues were identified as primary sources of occupational stress. A study by Kumaresan et al. (2022b), focused on IT professionals working from home during the pandemic, showed that 95% of them suffered from the burnout syndrome. Furthermore, women were found to be more susceptible to burnout than men, showing higher rates across all age groups (Kumaresan et al., 2022b). Another study conducted among Indian IT professionals revealed low levels of life satisfaction, which was negatively correlated with the number of working hours (Ram et al., 2022). Notably, a study among IT professionals working from home found that specific relaxation techniques (Jacobson's relaxation technique combined with *Bhastrika Pranayama*) significantly reduced burnout levels (Kumaresan et al., 2022a). Finally, a study by Thomson et al. (2023) found a moderate negative correlation between burnout and job satisfaction, as well as a weak positive correlation between work-life balance and job satisfaction.

Technostress and blurred digital boundaries: The excessive use of digital technologies and their constant availability, particularly in remote work environments, lead to technostress among IT professionals (Brooks, 2023). A study by Sharma et al. (2025), conducted among Indian IT professionals, revealed that the threat of job loss due to the implementation of artificial intelligence (AI) caused profound psychological distress. Six main themes were identified: emotional shock, loss of professional identity, chronic anxiety, social isolation, adaptive and maladaptive coping strategies, and a sense of betrayal by the organization. The authors emphasized that this industry shift represented not merely a change in the labor market but a profound psychological upheaval.

Organizational and managerial characteristics: The lack of autonomy and management support (Walia & Narang, 2015; Zadow et al., 2023), as well as dissatisfaction with compensation and social climate (Kanwar et al., 2012; Anthony-McMann et al., 2017; Farooq et al., 2022; Harden et al., 2018), also have a significant impact on the psychosocial state of IT professionals. A study by Weerarathna et al. (2022) showed that trust and management support significantly influenced work-life balance among software engineers working from home. Working in a designated space free from distractions was also found to be crucial for achieving this balance. Studies by Harden et al. (2018) and Farooq et al. (2022) indicated that the fear of skill obsolescence in a rapidly changing technological environment could generate chronic anxiety, while perceived unfairness in pay and rewards would inevitably reduce organizational commitment and loyalty.

Motivation and job satisfaction: Motivation and job satisfaction are important aspects of IT professionals' well-being. A study by Tiwari et al. (2023) identified that key motivational factors for IT professionals included career growth, job flexibility, and recognition. The authors emphasized that flexibility should not be limited to a flexible schedule but rather include autonomy in decision-making and the ability to influence one's own work. Recognition, in turn, should be expressed

not only through financial compensation but also through a sense of value and respect from colleagues and management, which could directly impact overall well-being.

Communication: Communication plays a complex role in the context of IT professionals' well-being (Smite et al., 2022; Walia & Narang, 2015; Russo et al., 2021). The effectiveness of team communication, especially in remote work environments, can act as both a facilitator and a barrier to well-being. For instance, the lack of face-to-face meetings and uncertainty in interactions can lead to misunderstandings and a sense of social isolation (Smite et al., 2022). At the same time, as shown by Jayanandana et al. (2023), effective communication has a positive, albeit less significant, impact on the productivity of IT professionals. A study by Russo et al. (2021) confirmed that the quality of social contacts positively influenced well-being, helping to cope with stress and prevent burnout. Nevertheless, Walia & Narang (2015) noted that a high volume of interpersonal interactions in teamwork, especially under tight deadlines, could also increase psychological tension and contribute to stress. Thus, it is not the fact of communication itself, but rather its quality, frequency, and context that determine its role in IT professionals' well-being.

Personal health resources encompass information, opportunities, services, and any other assistance provided by a company to support or motivate employees' efforts to improve or maintain a healthy lifestyle, as well as to monitor and preserve their physical and mental health. Common challenges at this level include: lack of free time, lack of facilities for physical activity, sedentary lifestyle, unavailability of healthy food in the workplace, difficulties in accessing medical care, and unhealthy habits.

To mitigate threats at this level, a company can provide its employees with access to sports facilities, organize healthy catering in the workplace, and offer medical check-ups or health education programs. However, empirical data confirm the prevalence of unhealthy habits among IT professionals (Banerjee et al., 2023; Padma et al., 2015). A study by Mahajan et al. (2025), conducted among 208 IT professionals in India, revealed the prevalence of unhealthy habits in this professional group: 15% smoked daily and 20% consumed alcohol twice a week. Additionally, 89% of the respondents used electronic devices before bedtime, reporting moderate (63%) and high (3%) stress levels, as well as physical inactivity (56%). A study by Raju et al. (2025) of 200 young IT professionals found that 70% of them suffered from sleep problems, with a significant correlation between daily caffeine consumption and insomnia ($r = 0.51$, $p < 0.05$).

A study by Ramakrishnan (2025) of 100 IT professionals in Bangalore found that the choice of self-help strategies for stress reduction varied by gender, age, and marital status. Men were more likely to prefer listening to music and sleeping more on weekends, whereas women tend to prioritize diet, yoga, and physical exercise. Younger professionals were more likely to choose music, hobbies, and prolonged sleep, while those over 40 prefer yoga, diet, and religious practices. A study by Padmaja et al. (2018) showed that IT professionals had a predominantly external locus of control for health, meaning they tended to attribute their health to chance

rather than their own efforts. This may hinder the maintenance of healthy habits, such as proper oral hygiene. Conversely, the study found that individuals with a stronger internal locus of control, who believed in their own ability to influence their situation, maintained better oral hygiene. A study by Reddy et al. (2016), conducted among 1017 Indian IT professionals, found that barriers to regular dental visits increased with age. These barriers included the lack of dental insurance and an increased number of working days per week, with women more frequently reporting issues related to limited knowledge about dental care.

The implementation of personal health resources within the HWM is considered through the opportunities provided by corporate health and well-being programs. Some studies have also shown that it is not easy to change employees' health behaviors simply by improving the health environment without actively promoting a healthy lifestyle (Brehm et al., 2011). Therefore, the development and promotion of workplace health policies, along with actual health promotion activities, can allow employees to more directly experience the health culture (Nea et al., 2017) and to a greater extent create facilitators for this, rather than simply removing barriers (Jackson et al., 2025a; 2025b).

Enterprise community involvement concerns the health of the community where employees live and work. A company's contribution can include, for instance, reducing harmful emissions, supporting local health programs, providing healthcare to employees' families, and participating in the development of local infrastructure. In this context, corporate volunteering programs deserve special attention. They allow employees to actively participate in community life, benefiting both society and themselves (Jones, 2016). Corporate volunteering increases employees' satisfaction and retention, while also strengthening the organization's reputation and its ties with external stakeholders (Cycyota et al., 2016). This relationship is partly explained by the fact that employees' motivation to volunteer, based on the desire to express personally significant values, is positively correlated with their organizational commitment (Brockner et al., 2014). However, despite the widely recognized positive impact of volunteering on well-being, there is currently a lack of research examining the relationship between IT professionals' health and their participation in volunteering activities. At least, the authors of this review have not found any studies on this topic. Nevertheless, based on the overall research, it should be noted that volunteering can be beneficial for preventing emotional burnout, but it may prove ineffective for those already experiencing it (Metzger et al., 2024). This highlights a potential barrier: if an IT professional is already experiencing burnout due to work intensity or other factors, volunteering may not yield the expected health benefits and, on the contrary, may exacerbate the situation.

Discussion

Interpreting occupational risks for IT professionals through the HWM framework allows us not only to describe threats to health and well-being but also to identify job design characteristics that functionally restrict health-promoting behaviors and, therefore, are relevant for subsequent diagnostics and interventions.

Methodologically, two levels of description should be distinguished: (1) workplace risk, and (2) barrier to healthy behavior. A workplace risk is a characteristic of the work organization and the production environment (exposure) that increases the probability of adverse consequences. A barrier to healthy behavior is a personalized obstacle arising from the interaction between an individual and the work environment, manifested as a reduced likelihood of performing health-promoting activities (sleep, breaks, physical activity, nutrition, seeking help). Consequently, the same risk may not become a barrier for employees with high resources and stable habits, but it can transform into a pronounced barrier for employees from vulnerable groups (e.g., chronic fatigue, somatic symptoms, low stress resilience, or a deficit of recovery strategies). This differentiation between risks and barriers is based on the Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2007): risks describe demands (workload, deadlines, cognitive complexity, constant availability, etc.) and environmental resource shortages (autonomy, support, recovery norms, infrastructure). The imbalance between demands and resources exacerbates the health deterioration process, which reduces the likelihood of regular health-promoting actions and transforms a workplace risk into a barrier to healthy behavior (Demerouti et al., 2001; Bakker & Demerouti, 2007).

As applied to the logic of the future questionnaire, it is crucial to capture not symptoms (pain/fatigue), but rather manageable conditions that transform a risk into a barrier to healthy behavior. Physical workplace risks for IT specialists in this block (prolonged sitting, static posture, repetitive movements, screen time, ergonomic and environmental deficits) become potential barriers when they reduce the feasibility of regular micro-breaks, postural changes, physical activity, vision restoration, and proper nutrition. When diagnosing barriers, it is crucially important to record manageable conditions (i.e., the quality of ergonomics and environment, the availability of infrastructure for rest/nutrition, and the perceived reasonableness of breaks) rather than somatic symptoms themselves. Psychosocial workplace risks for IT professionals (high workload, deadline pressure, multitasking, information overload, high responsibility, technostress, blurred boundaries, and constant availability for work communications) increase the likelihood of barriers to healthy behavior in the context of time pressure (displacement of sleep, meals, and breaks), depleted self-regulation and self-organization resources, and a lack of support or feedback from managers and colleagues regarding both professional tasks and health/well-being issues. Notably, psychosocial risks most significantly increase the likelihood of barriers to healthy behavior through organizational policies, practices, and procedures aimed at protecting psychological health (Dollard & Bakker, 2010; Karatuna et al., 2025). The personal health resources block reflects, on one hand, organizational opportunities provided for health promotion (physical and mental health support, access to medical care) and, on the other hand, subjective attitudes towards one's own health. Although there is no specific research on how enterprise community involvement affects the health and well-being of IT employees, this aspect may be considered optional.

For the future diagnostics of organizational-level barriers to healthy behavior, it is advisable to focus on the organizational component (the availability and

feasibility of health resources), whereas the individual level of barriers (self-regulation, coping strategies, control beliefs) requires a separate instrument or module to avoid conflating levels and blurring the construct. Methodologically, the question of "personal health resources" in the HWM remains dualistic: on the one hand, it includes resources provided by the organization in the form of health and well-being programs; on the other hand, it is linked to individual psychological characteristics of an employee's behavior. To avoid conflating levels of explanation, the questionnaire should consist of two parts: the first, "Organizational-level barriers to healthy behavior", which should be structured around the institutional (organizational) level, and the second, "Individual-level barriers to healthy behavior", which should include questions about individual-level barriers.

In terms of the content validity criteria for the future instrument, items should describe contextual, modifiable work characteristics; be clearly linked to a specific class of health-promoting activities; represent key mechanisms of barrier emergence (time/energy, infrastructure availability, norms and support, digital boundaries); and allow for direct linkage to barrier-reducing measures. Therefore, it is appropriate to define the construct of the future questionnaire as an assessment of organizationally manageable conditions that increase the likelihood of identifying and overcoming barriers to healthy behavior.

This study was conducted in the format of a scoping review; therefore, it does not involve a quantitative meta-analysis or a formal risk of bias assessment. The findings describe a map of factors and potential mechanisms rather than effect sizes or causality. The heterogeneity of sources (countries, IT roles, work formats such as office/remote/hybrid, and differences in research designs and metrics used) limits the direct comparability of frequencies and results, necessitating further empirical verification in specific organizational contexts. Many studies record behavioral indicators of health-promoting practices indirectly, highlighting the importance of subsequent operationalization of barriers by measuring manageable work conditions and applying content validation procedures for the future questionnaire items. Finally, the HWM domain related to enterprise community involvement is limitedly represented in digital professions; therefore, the corresponding module of the instrument should be considered optional and its role should be verified empirically.

Conclusion

This review confirms the existence of a substantial complex of occupational risks in the work of IT professionals, such as physical (musculoskeletal, visual, and metabolic disorders) and psychosocial problems (high stress levels and professional burnout), despite the formal absence of hazardous production factors. These risks are caused by a complex interaction of multi-level determinants: the nature of the work itself (physical inactivity, high cognitive demands), deficiencies in the physical environment (inadequate ergonomics), characteristics of the psychosocial environment (productivity demands, organizational culture, work-life balance), and the state of personal health resources (lifestyle, presence of unhealthy habits). Workplace risks can transform into barriers for two reasons: first, as direct behavioral

restrictions (poor workplace organization, lack of recovery conditions, specific job design features); and second, as "secondary barriers" arising from accumulated discomfort, pain, and fatigue during the workday. These secondary barriers decrease the likelihood of micro-breaks, movement, and recovery after work, thereby limiting the employees' ability to restore and replenish their resource base.

The application of the HWM, encompassing the physical and psychosocial work environment, personal health resources, and enterprise community involvement, provides an effective and evidence-based framework for a holistic analysis of risks that may act as barriers to healthy behavior and impact the well-being of IT professionals.

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Обзорная статья

Риски рабочего места ИТ-специалистов и их связь с барьерами здорового поведения: обзор зарубежных исследований в контексте модели «Здоровое рабочее место»

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Аннотация. В современном информационном обществе, где ИТ-специалисты занимают центральное место, их профессиональная деятельность, несмотря на кажущуюся безопасность, связана со специфическими и не всегда очевидными рисками для здоровья. Значимость изучения данных рисков определяется их прямым влиянием на производительность труда, здоровье и благополучие ИТ-специалистов. Цель исследования — проведение обзора и систематизации зарубежных научных данных о рисках рабочего места ИТ-специалистов в контексте модели ВОЗ «Здоровое рабочее место» (ЗРМ), а также обоснование разработки опросника барьеров здорового поведения организационного уровня. Проведен скопинг-обзор по протоколу PRISMA-ScR, поиск источников выполнен в базах данных Scopus, WoS, PsycINFO, PubMed и Google Scholar с последующим

целевым просмотром списков литературы и поиска по цитированию. Критерии включения P-E-O-S: ИТ-специалисты (P, Population), их риски рабочего места, которые могут стать причинами барьеров здорового поведения (E, Exposure/Context), результаты для здоровья/благополучия (O, Outcomes); эмпирические количественные, качественные и смешанные исследования на английском языке, опубликованные в рецензируемых журналах (S, Study Design). Из более чем 500 найденных статей в итоговый обзор включены 45 публикаций. Результаты показывают, что ИТ-специалисты сталкиваются с комплексом рисков, несмотря на формальное отсутствие вредных производственных факторов. Эти риски включают физические (заболевания опорно-двигательного аппарата, проблемы со зрением, метаболические и сердечно-сосудистые нарушения) и психосоциальные (стресс, выгорание, отсутствие баланса между работой и личной жизнью) проблемы. Физические риски обусловлены длительным сидением, недостатком физической активности и плохой эргономикой рабочего места. Психосоциальные риски связаны с высокой рабочей нагрузкой, жесткими сроками и размытием цифровых границ. Личные ресурсы здоровья сотрудников имеют двойственный характер: с одной стороны, они зависят от реализуемых в компании программ здоровья и благополучия, а с другой — от субъективного отношения к собственному здоровью и особенностей образа жизни в целом. Исследования о влиянии участия организации в жизни сообщества на здоровье и благополучие ИТ-сотрудников носят ограниченный характер. Разделение рисков рабочего места и барьеров здорового поведения позволяет выделять управляемые условия труда как ключевые мишени профилактики. Применение модели ЗРМ дает возможность комплексно анализировать риски для здоровья ИТ-специалистов, что позволяет глубже понять причины возникновения барьеров здорового поведения в данной профессиональной группе и обеспечивает содержательную основу для разработки опросника.

Ключевые слова: ИТ-специалисты, здоровое рабочее место, профессиональное здоровье, риски рабочего места, физическая производственная среда, психосоциальная производственная среда, личные ресурсы здоровья работника, участие предприятия в жизни сообщества, барьеры здорового поведения.

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