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**Enhancing hotel employees' well-being and safe behaviors:
The influences of physical workload, mental workload,
and psychological resilience**

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Abstract

Research background: Despite the dynamically growing cross-sectional academic studies conducted on various aspects related to physical and mental workloads in the context of workplace safety, there is still room for further in-depth analyses of how these workloads affect employees' behavior and well-being. This phenomenon is of particular interest in the case of hospitality, where hotels should recognize the workloads imposed on their employees, since they are considered the most critical and influential stressors in the workplace.

Purpose of the article: Based on the conservation of resources (COR) theory, our study aims to examine how hotel employees' physical and mental workloads affect their well-being and safe behaviors. The study also investigates how employee well-being and psychological resilience play a role in these patterns.

Methods: The study employs an experience-sampling methodology to assess the physical and mental workloads of a group of full-time employees working in luxury hotels in the USA.

Findings & value added: The findings derived from Partial Least Squares Structural Equation Modeling (PLS-SEM) reveal that both physical and mental workloads negatively impact overall well-being and safe behaviors. Additionally, physical workload influences mental workload. Also, employee well-being has been identified as a mediating factor in the relationship between workloads, psychological resilience, and safe behaviors. Notably, psychological resilience has not exhibited a moderating effect. This study expands on the COR theory by examining its impact on the hospitality industry. The study has developed and validated a model for assessing hotel employees' physical workload. Moreover, it emphasizes the significance of employees' well-being and psychological resilience in promoting safe behaviors in hotels. Therefore, this model is a significant step forward toward effectively measuring and maintaining the overall well-being and safe behaviors of employees in the hospitality industry. Furthermore, the value of the research is enhanced by surveying hotel employees directly rather than relying on subjective opinions from management about employee involvement in workplace health and safety. This approach avoids the bias often present in management assessments and provides a more accurate depiction of employee participation.

Introduction

Workplace injuries and accidents remain a pressing safety issue that requires immediate attention and effective solutions (Li *et al.*, 2013). The World Health Organization emphasizes the importance of addressing the root causes of safety issues and promoting a supportive work environment for employees' physical and mental well-being (World Health Organization, 2021). Neglecting these aspects may have serious repercussions for both organizations and employees, since they can negatively affect em-

ployee performance (Thanem & Elraz, 2022). Moreover, it can entail substantial costs for society and the economy. Hence, it is important to take steps to eradicate these risks by ensuring the presence of safety measures in all workplaces (Boczkowska *et al.*, 2022).

Despite the progress made in implementing quality management principles, such as ISO 9001:2015, the establishment of occupational health and safety management systems following OHSAS 18001 (2007) and ISO 45001 (2018) guidelines, and the widespread adoption of behavior-based safety programs and safety culture initiatives, global accident rates have shown little improvement. According to the International Labour Organization, 2.78 million employees lose their lives each year due to work-related accidents and occupational diseases; furthermore, 374 million employees suffer non-fatal injuries on the job. These distressing statistics paint a grim picture where 7,500 individuals perish daily as a direct result of unsafe working conditions. Additionally, the economic impact of lost working days is estimated to make up nearly 4% of the global GDP, reaching 6% in certain countries (Boczkowska *et al.*, 2022; International Labour Organization, 2018; Silva *et al.*, 2021).

This is particularly true in the hotel context, where employees experience high levels of stress in their work environment due to factors such as frequent shifts, heavy workloads, unfavorable working hours, constant customer interaction, and emotionally intense situations (Saah *et al.*, 2021). This makes them particularly vulnerable to occupational diseases, injuries, and accidents (Zhang *et al.*, 2022). According to Choi (2024), around 80% of accidents are caused by employees engaging in unsafe behaviors, which can lead to health and safety issues, hefty financial losses, and damage to the hotel's reputation and customer trust (Chenarboo *et al.*, 2022).

To effectively promote safe behaviors, hotels must place a stronger emphasis on the workload imposed on their employees, since it is the most critical and influential stressor in the workplace (Zhang *et al.*, 2020). Workload comprises both physical and mental aspects that determine an individual's performance (Restuputri *et al.*, 2019). Previous studies have indicated that excessive workload can lead to physical and mental fatigue, exhaustion, and negative work attitudes. If these conditions persist, they can have long-term psychological and health effects (Restuputri *et al.*, 2019). Furthermore, increased physical effort places greater demands on mental resources, which, in turn, results in decreased concentration and accuracy,

eventually leading to reduced efficiency over time (Nasirizad Moghadam *et al.*, 2021).

Despite the extensive cross-sectional academic studies conducted on various aspects related to physical and mental workloads in the context of workplace safety (i.e., personal attitudes) (Burt *et al.*, 2009), the leadership style exhibited within a workplace (Lu & Yang, 2010), regulatory practices, how individuals perceive and assess risks (Arnau-Sabatés *et al.*, 2012), the effectiveness of training programs, job demands and resources (Bronkhorst, 2015), the level of job-related stress and emotional intelligence (Lu & Yang, 2010), safety leadership, workload, and accident experiences (Oah *et al.*, 2018), and the overall safety environment within an organization (Adi & Eliyana, 2021), research on the impact of physical and mental workloads on employees' safe behaviors and well-being is quite limited (Chenarboo *et al.*, 2022).

To address the shortcomings of prior research, this study utilizes the conservation of resources (COR) theory as a framework to explore the relationship between employee physical and mental workloads and their effects on employees' overall well-being and safe behaviors within the hotel industry. By delving into these factors, this study aims to provide a comprehensive understanding of how workloads can impact employees in this specific context.

The core tenet of the COR theory is that employees struggle to obtain, retain, and maintain valuable resources (i.e., time, money, emotions, and knowledge) in response to their environment (Hobfoll *et al.*, 2018). Employees in a resourceful working environment are more likely to respond to challenging situations, such as high workloads (Xu *et al.*, 2020). Based on the COR theory, physical and mental workloads can occur when employees feel that their resources are insufficient to handle the stressors in their workplace, which can lead to negative effects on their physical and mental well-being (Karatepe *et al.*, 2021).

Furthermore, the Social Cognitive Theory posits that employees' behavior and decisions in the workplace can also be shaped by various psychological factors, aside from just the workloads (Wang *et al.*, 2022). The principle that investing in personal resources can help individuals withstand stress, which is based on the COR theory (Hobfoll *et al.*, 2018), is the foundation for understanding the role of psychological resilience in moderating these relationships. In addition, studies have indicated that having personal resources can significantly assist individuals in managing stress and

dealing with situations that drain their resources. These personal resources can also enable individuals to effectively cope with challenging circumstances and maintain their well-being (Chen & Eyoun, 2021). Thus, the conceptual framework presented in Figure 1 is proposed to answer the following research questions:

RQ1. To what extent do physical and mental workloads affect employees' overall well-being and safe behaviors in the hotel workplace?

RQ2. To what extent does physical workload affect employees' mental workload in the hotel workplace?

RQ3. To what extent do employees' overall well-being and psychological resilience affect these relationships?

Our approach aims to make several valuable contributions to the existing pool of knowledge. First, this study is expected to enhance the current understanding by shedding light on how workloads, both physical and mental, can impact the overall well-being and safe behaviors of hotel employees. This would enable the development of various interventions that can attenuate the negative effects of workloads, enhance employees' safe behaviors, and, thus, promote a culture of overall workplace safety. Second, the study provides substantial evidence emphasizing the significance of psychological resilience. This resilience enables employees to withstand and effectively manage stress and depression in their work environment. Third, this study expands on the COR theory by exploring its implications in the hospitality industry. It introduces a new framework for assessing hotel employees' physical workload and emphasizes the importance of their mental and emotional resilience in creating a safe environment. Finally, the research value is enhanced by directly surveying hotel employees rather than relying solely on managerial perspectives, thereby mitigating potential biases and offering a more authentic portrayal of employee engagement in workplace health and safety initiatives. The findings of the study can significantly improve understanding of hotel employees' safe behaviors and, consequently, provide useful insights for creating safety management guidelines.

The structure of this paper is organized as follows: In Section 2, a comprehensive background is provided on physical and mental workloads,

employee well-being, safe behaviors, and the importance of psychological resilience to employees' overall well-being. Section 3 delves into the methodology employed in conducting the study. The findings of the study are outlined in Section 4, while Section 5 compares and analyzes these results with previous research. Finally, Section 6 concludes the paper by exploring the implications, contributions, and limitations of the study.

Study framework and hypotheses developments

Linking physical workload, overall well-being, and safe behaviors

The COR theory emphasizes that when individuals feel threatened or lose resources, this can negatively influence their overall well-being. For example, research has shown that physical workload can lead to stress, exhaustion, and negative impacts on personal health (Bakker & Demerouti, 2017). If employees perceive or face increased work demands, they will need to use their resources to effectively cope with the situation (Inegbedion *et al.*, 2020). As a result, employees may find themselves burdened with stress and negative effects such as anxiety, fatigue, and work-related musculoskeletal disorders (Zappalà *et al.*, 2022).

An increasing body of research has indicated that employee workload can have a detrimental impact on their overall well-being. For instance, a study conducted by Shultz *et al.* (2010) revealed that employees overwhelmed with tasks have reported experiencing more negative health symptoms, almost double the amount, when compared to their counterparts. Similarly, Aalto *et al.* (2018) have found a correlation between workload and well-being in conventional work environments. More recent studies have further supported these findings, emphasizing the negative effects of workload on well-being (Pace *et al.*, 2021).

On the other hand, some studies have suggested that workload may have varying effects on an individual's motivation (LePine *et al.*, 2005), which, in turn, could have implications for overall well-being. Engaging in challenging tasks and responsibilities can have a positive impact on individuals' mental health and overall satisfaction with their job, ultimately fostering a stronger sense of loyalty and dedication to their organization. By pushing themselves to overcome difficult workloads, employees can experience a higher sense of accomplishment and fulfillment, which leads

to higher levels of motivation and job engagement. This, in turn, can contribute to a more positive work environment and increased productivity within the organization (LePine *et al.*, 2005; Li *et al.*, 2024).

Considering the hotel context, where employees often face elevated levels of stress while performing their job duties (Saah *et al.*, 2021), we posit the following hypothesis:

H1: *There is a negative relationship between the physical workload of employees and their overall well-being.*

The concept of workload is closely aligned with the job demands-resources model of stress (JD-R). According to this model, when the requirements and expectations placed on individuals in their jobs surpass their available resources and capabilities, this leads to a state of stress and strain (Oah *et al.*, 2018). Mänttari *et al.* (2023) have found that employees who experience a heavy physical workload suffer from increased fatigue and negative impacts on their overall well-being. As a result, unsafe behaviors could be manifested. Turner *et al.* (2005) have stated that employees with demanding jobs have had a limited understanding of their safety responsibilities and experienced higher levels of stress; this has led to an increased likelihood of accidents. Bronkhorst (2015) has also reported a negative relationship between work demands and safety behaviors.

The theory of self-control of resources suggests that individuals have limits in their ability to control their resources. When they exceed these limits and cannot quickly replenish their resources, they are more likely to feel negative and struggle to manage their behavior. Having a heavy workload can deplete their self-control resources, which makes it difficult for them to adhere to company rules and engage in safe behaviors (Chen *et al.*, 2022). This suggests that when employees face an increasing workload, they tend to experience heightened job strain, which prompts them to seek out fewer demanding approaches to fulfill their safety-related goals, and ensuring compliance with safety regulations becomes challenging for them (Oah *et al.*, 2018).

Recently, Kim *et al.* (2021) have revealed a relationship between physical workload and employees' situational awareness, which is crucial for risk perception. Their study examined the influence of physical workload on how well employees understand and perceive safety-related information. Notably, the findings indicated that workload negatively affects situational

awareness. Moreover, a study conducted by Saleem *et al.* (2022) found empirical evidence supporting that the level of physical demands placed on employees has a significant and negative impact on their overall safety performance in the workplace. Thus, we suggest the following:

H₂: *Physical workload has a negative influence on employees' safe behaviors.*

In addition, several studies (see Aubouin-Bonnaventure *et al.*, 2024; Bryson *et al.*, 2017), have indicated that the well-being of employees plays a crucial role in determining their performance and behaviors within an organization. Employee well-being is influenced by a multitude of factors, including, but not limited to, leadership styles, empowerment levels, resilience levels, stress levels, and burnout rates (Li & Hasson, 2020). Organizations can support their employees' well-being by offering a range of programs and initiatives designed to support their employees' mental, physical, and emotional health. These initiatives may include on-site fitness programs, flexible work schedules, career development coaching, emotional intelligence training, access to healthy food options, and the cultivation of a positive and supportive work environment (Abdullah *et al.*, 2021).

Empirically, Babic *et al.* (2020) have stated that employees' performance and safety outcomes decline when they experience stress, fear, pressure, anxiety, and tension in an unhealthy workplace environment. On the contrary, employees who have a higher level of independence are more likely to be satisfied, committed, and high-performing in their roles (Labrague *et al.*, 2019; Abdullah *et al.*, 2021). The detrimental effects of stress on employee performance have been evident in previous studies (see Chen & Fang, 2016; Gasparino & Guirardello, 2015). Overall, based on the COR theory, well-being is seen as a resource that employees can obtain (Hobfoll, 2002). When employees feel dissatisfied with their jobs, they may reduce their investment in other resources, which leads to a decline in their job performance and adherence to safe behaviors. Therefore, we propose the following:

H₃: *Employees' overall well-being positively mediates the relationship between physical workload and safe behaviors.*

Linking physical workload, mental workload, overall well-being, and safe behaviors

Mental workload is a subjective experience where an individual perceives a certain level of effort or burden while carrying out a task (Nino *et al.*, 2023). It is widely acknowledged that the attributes of both physical and mental workloads are intricately intertwined, with the potential to influence one another cyclically. Mental workload, encompassing the subjective cognitive processes of individuals, can affect physical abilities and result in exhaustion and performance errors (Restuputri *et al.*, 2019). Additionally, as physical exertion increases, it necessitates mental demands, which cause symptoms of fatigue such as decreased cognitive function, lack of focus, forgetfulness, low motivation at work, overall body tiredness, sleep difficulties, lethargy, dizziness, and drowsiness (Lestari *et al.*, 2023; Nasirizad Moghadam *et al.*, 2021). These responses have the potential to worsen the impact of ergonomic risk factors that influence employee behavior and attitude. This, in turn, can result in employees engaging in risky actions, such as adopting awkward body postures, which ultimately heightens their vulnerability to developing musculoskeletal disorders related to their work (Nino *et al.*, 2023).

Various jobs in the hotel industry require extra mental work due to technological advancements. Some researchers believe that moderate physical stress can improve cognitive performance (Audiffren *et al.*, 2008). Besides, engaging in physical activity may have different impacts on complex cognitive tasks such as problem-solving and decision-making (DiDomenico & Nussbaum, 2011). Therefore, we suggest the following:

H₄: *The physical workload experienced by hotel employees is positively related to their mental workload.*

Hotel employees often endure long working hours in a challenging environment (Chang *et al.*, 2020). Employees are particularly vulnerable to depression as a mental health condition because of factors such as isolation, job insecurity, and unstable finances. The demanding and high-pressure nature of their workplace increases depression and anxiety (Ahmad *et al.*, 2021) and negatively impacts their overall well-being (Khalid & Syed, 2023).

On the other hand, mentally stable employees tend to possess higher levels of energy, reliability, and productivity. Moreover, they typically

display a stronger sense of control and involvement in their work, which enables them to navigate and manage stressful circumstances more effectively (Day, 2005). Several recent studies have provided evidence suggesting a negative relationship between employees' mental workload and their productivity and performance in the hotel context (Akgunduz & Gürel, 2019; Bayighomog & Arasli, 2022; Saah *et al.*, 2021). Therefore, we propose the following:

H₅: Hotel employees' overall well-being is negatively impacted by the mental workload they experience.

In addition, engaging in mentally challenging tasks can have various impacts on human performance, behavior, musculoskeletal health, and pain sensation. These effects can also be influenced by psychosocial factors such as time limitations, task intensity, and the duration of the task demands (Wang *et al.*, 2022). Neal and Griffin (2006) have developed a safety behavior model that distinguishes between two types of individual behaviors in the workplace: safety compliance and safety participation. Safety compliance entails the necessary tasks employees must complete to ensure workplace safety, while safety participation involves behaviors that indirectly contribute to personal safety by creating a supportive safety environment. The job demand-resources (JD-R) model posits that high job demands can deplete employees' mental and physical resources, leading to exhaustion (Bakker & Demerouti, 2007). When faced with high demands, individuals may prioritize tasks that require less effort, potentially neglecting safety-related tasks (Hassan *et al.*, 2023). Furthermore, employees experiencing psychological distress may be less inclined to use safety equipment or report incidents of aggression or violence due to their focus on performance rather than safety (Mirza *et al.*, 2022).

Similarly, previous studies have indicated a negative relationship between mental workload and the occurrence of negative alterations in bodily behaviors (Jalali *et al.*, 2023; Nahrgang *et al.*, 2011; Nino *et al.*, 2023). Thus, we propose the following hypothesis:

H₆: The more mentally overloaded hotel employees feel, the less likely they are to engage in safe behaviors.

Moreover, we argue that overall well-being mediates the relationship between employees' mental workload and their safe behaviors. Employee well-being has been widely used in many studies as an independent variable, mediator, and moderating variable due to its significant influence on a range of individual and organizational outcomes, such as job performance (Hewett *et al.*, 2018), employee engagement (Tisu *et al.*, 2020), and positive behaviors (Mousa *et al.*, 2020). Based on the COR theory, Liao *et al.* (2019) have argued that mental stress can result in a depletion of resources in both work and non-work domains, which drives employees to expend more personal resources to achieve a work-life balance. Consequently, mental workload becomes a source of stress that drains resources and induces distress.

The negative impact of mental stress on well-being is attributed to the fact that dealing with mental demands consumes time and energy, leading to strain reactions (Slimmen *et al.*, 2022). This can then induce the development of unhealthy habits, such as insufficient sleep, poor nutrition, or a lack of exercise (Moen *et al.*, 2013). Conversely, well-being has been found to have a positive relationship with contextual performance. For example, Cropanzano and Wright (2001) suggest that healthier individuals are more inclined to take care of their work environment since they tend to focus on the positive aspects of the workplace and strive to maintain these favorable conditions (Wright & Cropanzano, 2007).

Additionally, positive well-being helps individuals expand their thoughts and actions and develop personal resources such as self-efficacy. These resources are important for motivating positive behaviors. Employees with positive emotions set high goals for work and believe that it will lead to positive outcomes (Hendriks *et al.*, 2020). Positive well-being also helps employees focus on tasks that contribute to a safe workplace. Consequently, individuals with a high level of well-being are more inclined to follow safety protocols and guidelines in the workplace. On the contrary, individuals experiencing poor well-being may be more prone to ignoring safety measures, particularly when faced with the challenge of allocating their limited resources toward improving their overall health (Wright & Cropanzano, 2007). Hence, we expect the following:

H7: The relationship between employees' mental workload and their safe behaviors is mediated by their well-being.

The roles of employees' psychological resilience and overall well-being

Many psychologists have investigated how individuals can manage psychological work distress; and they have found that personal resources such as psychological resilience play a significant role in reducing stress (Haldorai *et al.*, 2023). Psychological resilience is the individual's ability to cope with and recover from challenging life events, including workplace stressors (Langevin *et al.*, 2023). The COR theory proposes that resilience can help individuals manage stress and improve their overall well-being by reducing negative behaviors and dealing with negative psychological states (Avey *et al.*, 2011).

Gloria and Steinhardt (2016) have found evidence supporting the positive effects of resilience on reducing negative behaviors, managing work-related stress, and enhancing job satisfaction. Individuals with high psychological resilience tend to experience an overall sense of well-being and possess robust psychological health. Moreover, their ability to form and maintain positive work relationships is improved, which results in higher levels of self-confidence and autonomy (Delgado *et al.*, 2017). This, in turn, allows them to boost their professional skills and further elevate their job satisfaction and overall life. Therefore, we assume the following:

H₅: *Psychological resilience is positively related to employees' overall well-being.*

Furthermore, studies have shown that strong psychological resilience can help moderate the negative effects of stress on mental health, including anxiety and depression. It also allows individuals to successfully handle difficult situations in life and lowers their susceptibility to illnesses (Alonazi *et al.*, 2023; Kavčič *et al.*, 2021). Psychological resilience is characterized by adaptability and efficient coping mechanisms, which remarkably contribute to overall well-being and the ability to maintain good health (Song *et al.*, 2021). Besides, positive psychological resources promote safety-focused behaviors and mediate the negative impact of stress on mental well-being (Gao *et al.*, 2022). This indicates that hotel employees who have strong psychological resilience are more able to handle and cope with physical and mental stress, which, in turn, helps them exhibit safer behaviors at work. Hence, we expect the following:

H₉: *Psychological resilience moderates the relationship between physical overload and hotel employees' overall well-being.*

H₁₀: *Psychological resilience moderates the relationship between mental overload and hotel employees' overall well-being.*

In recent years, there has been a growing interest among researchers to fully understand how reduced employee well-being affects their work behavior (Halbesleben & Bellairs, 2015). Several studies have reported a strong correlation between diminished well-being in employees and an increased likelihood of experiencing work-related illnesses or injuries (Chung & Wu, 2013; Nahrgang *et al.*, 2011). This consistent pattern supports the notion that individuals who have lower levels of well-being are at a higher risk of encountering occupational illnesses or injuries. Nevertheless, the specific mechanisms behind the relationship between well-being and safety outcomes are not well understood. For example, a meta-analysis by Nahrgang *et al.* (2011) has shown that burnout is strongly associated with negative outcomes such as adverse events and accidents; however, no significant correlation between burnout and unsafe behavior is detected. On the contrary, subsequent studies have found significant relationships between burnout and unsafe behavior, particularly emotional exhaustion (Halbesleben & Bellairs, 2015; Silva *et al.*, 2021).

Well-being encompasses individuals' satisfaction and competence in their work and other activities (Huang *et al.*, 2016). In the hotel industry, ensuring employee well-being is crucial due to the challenges they face, which can lead to problems with work-life balance and high turnover rates (Kim *et al.*, 2021). Employees who are emotionally exhausted are less likely to follow safety protocols and may make mistakes that lead to workplace accidents (Choi, 2024). Conversely, employees with higher well-being tend to show advanced performance and exhibit positive work-related attitudes (Huang *et al.*, 2016). When employees perceive that they have a strong support system and access to job-related resources in their work environment, they are more likely to experience a sense of well-being and reduced levels of stress. This, in turn, can serve as a driving force for employees to approach their tasks with enthusiasm, adhere to safety guidelines, and exhibit behaviors that prioritize safety within the workplace (Rossi *et al.*, 2017; Silva *et al.*, 2021).

This study focuses on safe behaviors that cause physical harm when neglected and defines employee well-being as their overall experience and functioning. Therefore, this study suggests the following:

H₁₁: *Hotel employees' overall well-being is positively related to their safe behaviors.*

Furthermore, the existing literature suggests a correlation between employee well-being and the cultivation of positive attitudes and behaviors (see Hassan *et al.*, 2023; Woo *et al.*, 2015). De Paula Couto *et al.* (2011) have affirmed that employees with high resilience have improved psychological well-being, while high stress is associated with poorer well-being. Clarke (2010) has suggested that both organizational and psychological factors can influence employees' likelihood of engaging in risky behavior, particularly in workplace accidents.

Hence, we suggest that the positive impact of psychological resilience on employees' safe behaviors may be explained by its influence on well-being. In other words, employees' psychological resilience may contribute to their well-being, which, in turn, influences employees' engagement in safe behaviors in the workplace. Thus, we posit the following:

H₁₂: *Hotel employees' overall well-being mediates the relationship between employees' psychological resilience and their safe behaviors.*

Research methods

Participants and procedures

The current study focuses on luxury hotel employees in Florida State, USA, specifically employees in the kitchen and housekeeping departments. These employees face unique challenges such as long working hours, high-pressure situations, and heavy workloads. The work environment also contributes to conflicts among employees due to the need for customization and high customer demands (Karatepe *et al.*, 2021). Given these factors, the researchers believe that studying the impact of physical and mental workloads on employee well-being and safe behaviors in this group is crucial. Information about luxury hotels, including their names, locations,

contact numbers, and websites, was obtained from Smith Travel Research (STR) in 2023.

We contacted all luxury hotels in Florida State ($n = 70$) via emails and/or phone calls to invite their participation in the study. Out of 70 hotels, 31 agreed to participate, while 28 did not respond, and 11 disagreed to participate. An email accompanying a link to the online survey, which includes closed-ended questions, was sent to these luxury hotels in August 2023, explaining the purpose of the research and disseminating the survey's link among their employees. The online survey was adopted due to its common privileges, such as cost-effectiveness and speed. Additionally, it can reach a wider audience in different locations. It is also more convenient and flexible with regard to receiving honest responses to sensitive topics at any time. Besides, we used a random sampling procedure based on the research objectives. To determine the ideal respondents who have had direct involvement with the research subject, the survey contains two screening conditions for participating in the study. First, respondents must have at least one year of experience at the hotel. Second, respondents are working in the kitchen or housekeeping departments. Then, follow-up emails and phone calls were sent to the hotels to encourage their employees to fill out the survey. Due to the slow response rate of the respondents, data collection was completed in November 2023.

Sample size procedure

Following Cohen's (1988) sample size procedure, the required sample size was calculated based on a medium effect size, with reference to previous similar studies (Cohen's $d = 0.50$), statistical power of 0.80, and a significance level of 0.05.

$$n = \frac{2\left[Z_{1-\frac{\alpha}{2}} + Z_{1-\beta}\right]^2}{d^2} \quad (1)$$

where

n sample size

$Z_{1-2/\alpha} = 0.025$ (for a two-tailed test).

$Z_{1-\beta} = 0.84$ (for a power of 0.80).

$d = 0.50$ (effect size).

$$n = \frac{2[1.96+0.84]^2}{0.5^2} = \frac{15.68}{0.0625} = 250.88 \quad (2)$$

Consequently, the suitable sample size for the current study is 251 participants. We received 292 responses; 8 of them were excluded for having biased or incomplete answers. Therefore, only 284 responses, with a response rate of 97.3%, were used for the final statistical analysis. The research sample size aligns with earlier, similar research. For instance, Shapoval *et al.* (2022) examined 140 hotel housekeepers in Florida. Zhang *et al.* (2022) studied 249 hotel employees, while Shi *et al.* (2022) investigated 65 hotel employees in China. Furthermore, Boczkowska *et al.* (2022) surveyed 289 employees across two sectors (e.g., healthcare and other sectors). Thus, the sample size is considered suitable for statistical analysis and representative of the luxury hotel sector in the USA.

Among the 284 participants included in the study, 61.2% were male and 39.8% were female. Approximately 56.6% fell within the age range of 19 to 35 years, while 30.8% were aged between 35 and 45 years. The remaining 12.6% were older than 45 years. In terms of education, 46.2% of the participants held a high school degree; 42.1% had a bachelor's degree; 8.2% possessed an MBA; and the remaining 4.5% held a master's or PhD. Regarding work experience, 64.5% of the participants had accumulated 3 to 10 years; 24.1% had less than two years; and 11.4% boasted over ten years of professional experience. Lastly, 57.4% were employed in the kitchen department, while 42.6% worked in housekeeping.

Measures

The survey was divided into two distinct sections. The initial section encompassed measurements of physical workload, mental workload, employee overall well-being, and employee safe behaviors. The subsequent section comprised demographic variables, which included gender, age, educational qualification, years of experience, and departmental affiliation. Although there are several measurements to measure physical workload in different contexts, such as engineering, mining, and nursing, there is no agreed-upon measurement, specifically for the hotel industry. To address this problem, we have created a survey based on a thorough review of existing literature that aligns with our research objectives. It has been argued that self-administered questionnaires can be a viable alternative to objectively assessing physical workload (Bot *et al.*, 2004). Therefore, we utilized the Dutch musculoskeletal questionnaire (DMQ) and studies by Bot *et al.* (2004); Haraldsson *et al.* (2022) to develop a scale for measuring physical

workload in hotels. Next, we adjusted the survey items to 15 to suit the job characteristics of hotel employees and sought feedback from five academics. After that, we made slight modifications before conducting a pilot test. For instance, *working with your hands above shoulder level? and walking for long periods?* were adjusted to *“working with your hands for long periods? and moving for long periods, respectively*. Additionally, some indicators have been rebooted, such as *“Sitting or moving on your knees and bending or twisting your neck often?”*. The final draft of the physical workload measures consisted of nine items. Finally, we enlisted 80 students from the Faculty of Tourism and Hotels at the University of Sadat City, Egypt, who were working in luxury hotels or had completed their internships, to test the reliability and validity of the scale. The scale was rated using a four-level Likert scale (1 = very low; 4 = very high). Furthermore, minor adjustments were made to the language of the final version based on the findings from the pilot research.

Exploratory factor analysis

We utilized SPSS software version 24 for assessing and validating the measurement of physical workload based on the data obtained from the pilot study. Exploratory Factor Analysis (EFA) and Cronbach's alpha were employed to assess measurement validity and reliability, respectively. Prior to initiating EFA, the data underwent scrutiny to ensure its suitability for factorial analysis. The overall significance of the correlation matrix was 0.000. Bartlett's test of sphericity yielded a highly significant result ($p = 0.000$) of 3473.653, rejecting the hypothesis that the correlation matrix is an identity. The Kaiser-Meyer-Olkin (KMO) model value of 0.807 affirmed the adequacy of the sample. The Cronbach's alpha value of 0.963 indicated a satisfactory level of internal consistency for the scale. The results indicated a significant correlation in the data, making it suitable for factor analysis. EFA with Varimax orthogonal rotation was conducted to identify constructs, specifically heavy physical load, and repetitive movements, from independent variables with eigenvalues exceeding one. These constructs collectively explained 69.1% of the total variance, surpassing the minimum threshold of 60% (Hair *et al.*, 2012). As depicted in Table 1, the factor loading of each element under each factor exceeded the 0.55 threshold. Furthermore, cross-loadings of items on other factors were below the suggested value of 0.3 (Hair *et al.*, 2014).

In addition, the mental workload was assessed using the NASA-TLX questionnaire, which included six dimensions: mental demand (MD), physical demand (PD), temporal demand (TD), performance (P), frustration (F), and effort (EF). The participants rated their experiences on a four-level Likert scale, ranging from "very low = 1" to "very high = 4." This adapted version of the questionnaire is similar to the one used by Pamungkas *et al.* (2022). The higher scores on the scale indicated higher levels of mental workload. Workplace well-being was investigated through the analysis of seven items, graded on a 5-point Likert scale ranging from 1 to 5 (strongly disagree to strongly agree). These items were sourced from DiPietro *et al.* (2020). Additionally, employee safe behavior was evaluated using six items that covered two dimensions: safety participation (3 items) and safety compliance (3 items), adapted from Wong & Chan (2020). Each of these items was rated on a 5-point Likert-type scale (1 = never; 5 = always), with higher scores indicating greater agreement with the provided descriptions. Moreover, the psychological resilience of hotel employees was assessed using a 10-item scale, with response options ranging from 1 (strongly disagree) to 5 (strongly agree), retrieved from Haldorai *et al.* (2023).

Analyzing data techniques

Guided by our hypotheses, we employed the Partial Least Squares (PLS) technique to analyze the data. PLS is widely acknowledged for its effectiveness in estimating path coefficients within structural models, particularly in the context of hospitality and tourism research (Abou Kamar *et al.*, 2023; Alsetoohy *et al.*, 2021; Alsetoohy & Ayoun, 2018). Its prevalence in this field is attributed to several advantages (Hair *et al.*, 2014; Henseler *et al.*, 2016). For example, PLS yields robust model estimations even when dealing with data exhibiting both normal and highly non-normal distributional properties, thereby relaxing stringent assumptions about data normality. Furthermore, PLS proves advantageous for studies characterized by small sample sizes, emphasizing prediction and theory development. It is also well-suited for models featuring a substantial number of indicators. This study focuses on evaluating the mental and physical workloads of hotel employees, a relatively novel endeavor in the realm of hospitality. The model comprises a total of 38 indicators. Consequently, in light of these considerations, the research hypotheses underwent testing through SmartPLS-SEM Software version 4. The theoretical model was evaluated in

two steps using the software. First, the measurement model was examined. Then, the structural model was assessed.

The outer (measurement) model quality

Table 2 illustrates that the composite reliability (CR) for all latent variables (LVs) in the measurement model exceeded the 0.6 threshold (Hair *et al.*, 2012), except for HPHL7 and 8, which were rebooted. This indicates that the measurement model displayed internal consistency and reliability. Moreover, all item loadings exceeded the recommended value of 0.7, construct CR values were higher than 0.7; and average variance extracted (AVE) values exceeded the threshold of 0.6 (Hair *et al.*, 2012), as shown in Table 2. This affirmed the establishment of convergent validity. As illustrated in Table 3, discriminant validity was confirmed since the Heterotrait-Monotrait (HTMT) values did not exceed the threshold of 0.85 (Hair *et al.*, 2012), and all construct correlations were lower than the square root of AVE for their respective constructs. Besides, the highest Variance Inflation Factor (VIF) value was 5.6, and all indicators were below the threshold of 10, confirming the absence of multicollinearity issues between the constructs (Abou Kamar *et al.*, 2023). This also collectively supports the reliability and validity of the scales.

The structural model

The structural model was evaluated using, R^2 , p values, effect sizes (f^2), and the path coefficient's significance (β). The model findings of the study indicated R^2 values of 27.7%, 45.1%, and 67.2% for all the dependent variables, suggesting that these variables explain approximately 27–67 % of the changes in the independent variables. This highlights a sequential explanatory power, according to Chin (2009). Additionally, Table 4 displays both β and P values, affirming the statistical significance among the model variables. We also determined the predictive relevance (Q^2) of the present model. Given that the Q^2 values exceeded zero — 0.296 for mental workload and 0.442 for safe behaviors — the model of the current study demonstrates robust predictive capability in accordance with the criteria outlined by (Hair *et al.*, 2014). Finally, we evaluated the effect size (f^2) of the research model based on Cohen's criteria. The outcomes revealed that the f-square effect size varied from 0.071 (indicating a weak effect) for psychological

resilience on overall well-being to 0.383 (indicating a strong effect) for physical workload on mental workload.

Results

Direct relationship results

The results of the testing hypotheses are presented in Figure 2 and Table 4. The findings show that the physical workload experienced by hotel employees negatively affects their overall well-being ($\beta = -0.343$, $p < 0.001$) and safe behaviors ($\beta = -0.302$, $p < 0.001$), which supports H1 and H2, respectively. Similarly, our results indicate that physical workload positively affects employees' mental workload ($\beta = 0.526$, $p < 0.001$). As a result, H4 is supported. On the other hand, mental workload negatively affects the hotel employees' well-being ($\beta = -0.376$, $p < 0.001$) and safe behaviors ($\beta = -0.253$, $p < 0.001$) in the workplace, which confirms H5 and H6, respectively. Thus, the higher the physical workload and/or mental workload, the lower the overall well-being and safe behaviors hotel employees experience. Moreover, the results show that there is a positive relationship between employees' psychological resilience and well-being ($\beta = 0.198$, $p < 0.05$), which means that overall well-being tends to be high if perceived employees' psychological resilience is high. Hence, H8 is supported. Additionally, the findings reveal that employee well-being positively relates to their safe behaviors in hotels ($\beta = 0.420$, $p < 0.001$), which supports H11.

Indirect relationship results

The mediation results

We employed a bootstrapping method involving 5000 samples to calculate the Confidence Interval (CI), T-statistics, t-value, p-values, and path coefficients. In evaluating the mediating effects of overall well-being, we adhered to the two methodologies recommended by (Preacher & Hayes, 2008), specifically bootstrapping for both the indirect effect and the confidence interval. The findings have revealed a significant indirect effect of physical workload on employees' safe behaviors through overall well-being ($\beta = -0.144$, $t = 6.031$, $p < 0.001$). Besides, the total effect of physical

workload on employees' safe behaviors is significant ($\beta = -0.663$, $t = 18.405$, $p < 0.001$); and the inclusion of the mediator (the effect of physical workload on employees' safe behaviors) is still significant ($\beta = -0.302$, $t = 6.360$, $p < 0.001$). Similarly, the results indicate that the impact of mental workload on employees' safe behaviors is notably mediated by overall well-being ($\beta = -0.158$, $t = 5.677$, $p < 0.001$). Even when considering the mediator, the total effect of physical workload on employees' safe behaviors remains statistically significant ($\beta = -0.411$, $t = 9.922$, $p < 0.001$), demonstrating a persistent influence ($\beta = -0.158$, $t = 5.677$, $p < 0.001$). Not surprisingly, the results have also confirmed the competitive partial mediating role of overall well-being on the relationship between employees' psychological resilience and their safe behaviors in hotels ($\beta = 0.083$, $t = 2.387$, $p < 0.017$). Since the T-values for the mediators are higher than 1.96, the bootstrapped confidence interval (BCI) does not encompass the zero value for all hypotheses, as shown in Table 5. Hence, these results demonstrate that overall well-being plays a competitive partial mediating role in the relationship between physical workload, mental workload, and employees' psychological resilience and employees' safe behaviors. Consequently, H₃, H₇, and H₁₂ are corroborated, respectively.

Moderation results

To explore the moderating influence of employees' psychological resilience, the study has examined the path coefficients for high- and low-risk categories to identify any significant changes. The results, as displayed in Figure 2, indicate that employees' psychological resilience does not moderate the association between physical workload and overall well-being ($\beta = -0.003$, $p > 0.929$), nor does it moderate the relationship between mental workload and overall well-being ($\beta = -0.053$, $p > 0.215$). Consequently, H₉ and H₁₀ are not supported, respectively.

Discussion

Based on the COR theory, this study aims to validate a structural model investigating the impact of two different stressors, namely physical and mental workloads, on the overall well-being and safe behaviors of hotel employees. Additionally, the study focuses on exploring the mediating

effects of employees' overall well-being and the moderating effects of psychological resilience on these relationships. The first important finding reveals that hotel employees experience both intense physical pressure and a high mental workload. The scores derived from the NASA-TLX assessment have been noticeably affected by both the mental and physical workloads, and the interaction between them is significant. Higher scores are related to increased mental and physical workload levels, which could potentially increase human errors and increase the likelihood of accident occurrence. This is consistent with previous studies conducted outside the hotel context, which have shown that excessive workloads have negative effects on employee productivity, job performance, and customer service (Gilboa *et al.*, 2008).

In addition, the findings indicate that a high physical workload has a negative impact on the employees' overall well-being. This result is consistent with the findings of other studies in various contexts. These studies have consistently found that tasks that involve strenuous physical work are associated with an increased risk of developing musculoskeletal disorders, injuries, emotional exhaustion, stress, and a decline in self-rated health (Bowling *et al.*, 2015). Additionally, a study conducted by Møller *et al.* (2019) has reported that physical activity at work is linked to sickness, absence, cardiovascular disease, and mortality. This aligns with Karasek's Job Demand-Control Model (Hiesinger & Tophoven, 2019). Other studies have also mentioned that a high physical workload not balanced with enough time to recover causes emotional exhaustion and a decrease in overall well-being (Grobelna, 2021).

Moreover, our analysis confirms the results of previous research that a high physical workload has a negative impact on employees' safe behaviors. This aligns with the job demands-resources model of stress, which suggests that when the demands of a job exceed an individual's ability to handle them, this leads to stress (Oah *et al.*, 2018). Such stress can have detrimental effects on an individual's well-being, behaviors, and overall job performance. A high physical workload can also deplete mental and physical resources and cause health problems (Bakker & Demerouti, 2007). Additionally, employees may prioritize performance over safety by neglecting safety equipment or failing to report incidents. (Nahrgang *et al.*, 2011) also support the notion that physical demands have a negative relationship with safe behaviors. The finding is also consistent with results reported by Bronkhorst (2015) who asserted that higher levels of work pressure are

associated with a decline in both physical and psychosocial safe behaviors among employees.

Therefore, hotels should regularly assess the physical workload of their employees through surveys and feedback sessions to ensure they are working in safe conditions. It is also crucial to remain vigilant for signs of excessive workload and provide support to help employees complete their tasks safely. Moreover, hotels should have policies in place to manage workload during rush hours, for example, to distribute tasks evenly among employees. Furthermore, hotels should boast social connections among employees through team-building activities to improve their well-being and promote a positive work environment. These efforts can ultimately lead to safer behaviors.

In addition, our findings confirm that the mental workload experienced by hotel employees has a negative impact on their overall well-being. Previous studies have shown that mental overload can lead to anxiety, depression, and negative emotions (Huang *et al.*, 2022). This can then result in burnout, depression, sleeping disorders, and other illnesses (Khanal *et al.*, 2020). This result could be partially explained by Søvold *et al.* (2021), who have stated that mental stress at work can affect employees' psychological health, professionalism, service quality, productivity, and overall well-being. However, our findings contradict prior studies that have argued that mental stressors are viewed as “positive” ones because they affect physical and psychological well-being by turning stress into a source of passion and a sense of achievement (Stroe *et al.*, 2018). Such contradictory findings could be explained by considering the fast-paced and high-stress work situations and the settings in which hotel employees work. It is also important to consider employees' appraisal processes when studying mental workload in the hotel industry since their work environments and experiences vary (Yu *et al.*, 2021). Furthermore, our study has focused on exploring the relationship between mental workload and well-being on a day-to-day basis. It has been found that mental stressors negatively affect employees' well-being in the short term. This emphasizes the need to consider different time frames when studying employees' perceptions of mental stress in hotels. The study has also pinpointed that factors such as task performance, temporal demand, and effort have the foremost impact on mental workload, while frustration has the least impact. This emphasizes the importance of completing tasks, the urgency of completing them, and

the difficulties experienced by hotel employees as key factors in increasing their mental workload.

Additionally, the study has found that the mental overload experienced by hotel employees negatively affects their safe behaviors. This aligns with previous research showing that stressors like time pressure and mental workload can increase the risk of work injuries (Chenarboo *et al.*, 2022). Mental stress can lead to higher levels of anxiety and attentiveness, which can interfere with careful attention and reduce performance. Employees under high mental pressure may prioritize performance over safety, which leads them to seek less effortful ways to handle tasks related to safety. This can result in a decrease in people following safety rules and actively participating in creating a safe work environment. Therefore, hotels should implement training programs to improve employees' skills in time management, stress reduction, problem-solving, and decision-making. They should also organize activities to reduce stress and negative emotions among staff. Moreover, hotels can use Employee Assistance Programs (EAPs) that incorporate mental health resources and counseling services. Creating a positive work environment and prioritizing employee well-being will encourage safe practices. Managers and supervisors can offer ample support to help employees overcome work-related challenges, which will improve their psychological well-being and contribute to workplace safety. With these measures in place, work injuries can be significantly reduced in hotels.

The study has also identified a positive relationship between psychological resilience and overall well-being. This finding reinforces the previous study by Alonazi *et al.* (2023), which emphasized the positive impact of psychological resilience on decreasing stress, anxiety, and depression. Other studies have also found that psychological resilience helps individuals resist stress and reduces the occurrence of anxiety and depression symptoms (Gloria & Steinhardt, 2016). It acts as a safeguard against negative stressors and is associated with improved psychological well-being and a lower likelihood of mental illness (Aguiar-Quintana *et al.*, 2021). Thus, this study suggests that, at the individual level, hotel employees' psychological resilience can serve as a protective mechanism against the detrimental consequences of both physical and mental work stress. Consequently, hotels may develop and implement resilience training programs tailored to address the unique challenges faced by hotel employees. This training should focus on stress management, coping strategies, and building emo-

tional resilience. Such training would enhance employees' psychological resilience and reduce stress levels, which, in turn, would improve their overall well-being in the workplace.

Surprisingly, the analysis has revealed that employees' psychological resilience does not have a moderating effect on the relationship between physical or mental workload and well-being. According to earlier theories, highly resilient employees would have an advanced ability to handle stress and bounce back from challenging situations, while those with low resilience would be more likely to experience mental health issues. This result stands in contrast to the three theoretical frameworks discussed earlier in the introduction and utilized to generate the various hypotheses for this study, namely the Conservation of Resources (COR) theory, the Job Demand-Control (JD-C) model, and the Job Demand-Resources (JD-R) model (Bakker & Demerouti, 2007). Our results contradict the findings of previous studies suggesting that employees with higher resilience could mitigate the impact of job stressors on their overall well-being (Chen *et al.*, 2022; Haldorai *et al.*, 2023). Based on our findings, it appears that while resilience can be beneficial in boosting the overall well-being of employees, it is not enough to effectively tackle the depletion of resources resulting from both physical and mental workloads. One possible explanation for these findings could be attributed to the fact that hotel employees face challenging work stressors that make it difficult for them to cope solely through resilience and adaptability. Another possible explanation could be attributed to the presence of a curvilinear association, as suggested by Bowling *et al.* (2015), rather than the linear relationship that has been hypothesized and examined in this study. In other words, a moderate level of physical and work demands might be the most advantageous for individuals' well-being. On the other hand, well-being could potentially deteriorate when the physical workload is either excessively low or high.

This study has also indicated that there is a positive and significant association between employee well-being and safe behaviors in hotels. The results confirm the mediating role of employee well-being in the relationship between physical workload, mental workload, psychological resilience, and safe behaviors in hotels. When employees are satisfied with their jobs and feel valued by the organization, they are more likely to participate in safety practices. This is remarkably noted when employees have low physical and mental workloads (Grandey *et al.*, 2011). When employees have high levels of well-being, they are more motivated and their perfor-

mance is higher, which leads to their active participation in safe practices. This commitment to safety can also improve customer satisfaction. The findings gain support from previous studies that have established that employee well-being has a positive effect on their attitudes and behaviors, ultimately contributing to the success of organizations (Woo *et al.*, 2015). At the same time, several studies have found that employees with lower well-being are more prone to experiencing occupational illnesses or injuries at work (Nahrgang *et al.*, 2011). When employees experience high levels of well-being, they are more likely to fulfill their responsibilities productively; and their safe behaviors are positively influenced through following safety guidelines. On the other hand, when employees suffer from poor well-being, this can result in decreased productivity, and an increase in expenses (Hassan *et al.*, 2023).

Conclusions

Many previous studies have focused on improving employees' well-being and enhancing their performance and productivity by identifying and addressing the factors influencing their physical and mental health (see Bayighomog & Arasli, 2022; Sariisik *et al.*, 2023; Varga *et al.*, 2021). Our study broadens the scope of safe behavior research by incorporating a wide range of interdisciplinary perspectives to ensure safety and minimize risks in work ergonomics. This study provides new insights into how workloads, both physical and mental, can impact the overall well-being and safe behaviors of employees in the context of the hotel workplace, considering the role of psychological resilience. By examining these relationships, it becomes possible to develop various interventions that can attenuate the negative effects of workloads on employee safety. The study also introduces a scale to measure physical workload, specifically for hotel employees, which can be used in further studies in the future. Furthermore, the study provides substantial evidence highlighting the significance of psychological resilience, which is understood as a protective shield that helps employees endure and manage stress and depression to achieve well-being in hotels. Additionally, this study confirms the key role of employees' overall well-being in sustaining safe behaviors in the hotel sector. Hence, improved employees' overall well-being may result in obtaining or managing the psychological and physical resources to engage in safe work behaviors in

hotels. Finally, our model offers confirmation and concrete evidence for the theory of conservation of resources (COR) in the context of the hotel workplace. It presents a valuable structure for understanding the relationships between hotel employees' workloads, their well-being, and their adherence to safe practices.

Moreover, this study holds several implications for hotel operators. The study model can be used to restructure a roadmap for hotel operators to maintain both overall well-being and safe behaviors in the workplace. Given that increased physical and mental stress is significantly associated with workplace injuries and accidents, hotels must place a stronger emphasis on the workload imposed on their employees to effectively promote safe behaviors. Efforts should be made to reduce the stress levels of hotel staff. This can be achieved by addressing the unique needs of each employee and implementing training programs that aim to improve employees' overall well-being. Additionally, an effective strategy that hotels can adopt is to enlist qualified counselors who can offer psychological support and guidance to individuals overwhelmed by the demands of their jobs.

Moreover, the results of this study can offer significant advantages to hotel management by providing valuable insights into effective strategies for addressing and reducing stress among their employees. Recognizing the importance of hiring individuals with strong psychological resilience during the recruitment process is crucial for building a resilient and stress-resistant team. Implementing comprehensive training programs is also highly recommended to promote employees' psychological resilience. These programs can include engaging activities such as group learning sessions, goal-setting exercises, and pathway exploration exercises. Active participation in these training initiatives can significantly enhance employees' psychological resilience and equip them with the necessary skills to effectively manage stress in the challenging hotel industry (Li *et al.*, 2021).

Finally, it is crucial to consider the potential advantages of implementing a thorough management strategy aimed at enhancing the well-being of hotel employees. This can be done by actively engaging in open and transparent communication with employees to understand their values and goals and create a positive and supportive workplace that boosts employee morale.

Limitations and future research

This study is groundbreaking in its exploration of the physical and mental demands of working in hotels. However, certain limitations should be considered when interpreting our findings. First, it is worth noting that the study was based on a relatively small sample size of 284 full-time employees working in luxury hotels across the United States. This limited sample size might pose certain constraints when it comes to drawing broader conclusions and generalizing the findings to a larger population. Second, it is important to recognize that the scope of our investigation was specifically focused on two particular departments within these hotels, namely the kitchen, and housekeeping. Consequently, this narrow focus might potentially affect the extent to which our research outcomes can be applied to other departments or job roles within the luxury hotel industry. Thus, future research could replicate this research model across various hotel departments, scales, and in different countries, encompassing all employee categories. Third, we introduced a new scale to assess physical workloads in hotels. Therefore, future studies should further refine the scale to apply to both hotels and restaurants. Fourth, the scarcity of research studies in the hospitality industry on physical and mental workloads hindered our ability to make comprehensive comparisons with existing findings. Consequently, further research is recommended to facilitate such comparisons. Lastly, given the insignificant effects observed in employees' psychological resilience, it would be valuable to explore alternative variables, such as employees' mental health training, psychological capital, and self-management.

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Annex

Table 1. The rotated component matrix of the physical workload scale

Items To what extent do you experience problems associated with...	Factors	
	Heavy physical workload	Repetitive task/movement
HPhL6: physical hard work.	.899	
HPhL1: standing for long periods.	.890	
HPhL2: moving for long periods.	.888	
HPhL3: kneeling or squatting for long periods.	.862	.115
HPhL4: working with your hands above shoulder level.	.798	.211
HPhL5: exerting maximal force.	.785	.231
HPhL7: eyesight demands in your work.	.702	.302
HPhL8: prolonged sitting in your work.	.595	
RSM1: performs the same motion for an extended time		.945
RSM3: keep the neck in a bent or twisted position.		.931
RSM4: repeatedly does tasks with arms, hands, or fingers.	.216	.556

Table 2. Validity, reliability, and descriptive results

Item/ variable	Loadings	Mean	SD
Employee overall well-being ($\alpha = 0.968$, CR= 0.973, AVE= 0.839)			
I am satisfied with my work.	0.918	2.944	0.854
Overall, I am quite satisfied with my current job.	0.906	3.021	0.975
I derive true enjoyment from my job.	0.929	2.965	0.952
I find work to be a meaningful and fulfilling experience.	0.916	3.07	0.939
I am constantly able to discover methods to enhance my job.	0.901	2.93	0.802
I feel satisfied with my work achievements in my current job.	0.922	2.915	0.843
I am satisfied with the performance of my team.	0.920	3.00	0.888
Physical workload ($\alpha = 0.828$, CR = 0.921, AVE = 0.853)			
To what extent do you experience any problems associated with			
<i>Heavy physical load</i>			
physical hard work?	0.910	3.415	0.653
standing for long periods?	0.848	3.275	0.723
moving for long periods?	0.758	3.419	0.653
kneeling or squatting for long periods?	0.856	3.324	0.708
working with your hands for long periods?	0.793	3.423	0.654
exerting maximal force?	0.864	3.423	0.654

Table 2. Continued

Item/ variable	Loadings	Mean	SD
<i>Repetitive movement</i>			
making the same movement for long periods?	0.729	3.556	0.551
holding your neck in a bent-forward or twisted position for a long time?	0.921	3.366	0.717
doing repetitive tasks with arms, hands, or fingers?	0.939	3.401	0.703
Mental workload	($\alpha = 0.878$, CR = 0.909, AVE = 0.627)		
EF: How hard did you have to work to accomplish your level of performance?	0.765	3.194	0.693
PD: How physically fatiguing was your work?	0.892	3.156	0.685
FR: How insecure, discouraged, irritated, and stressed were you?	0.839	3.18	0.686
TD: How hurried or rushed was the pace of your work?	0.703	3.32	0.671
MD: How mentally fatiguing was your work?	0.882	3.183	0.688
P: How successful were you in accomplishing what you were to do?	0.652	3.352	0.647
Psychological resilience	($\alpha = 0.959$, CR = 0.956, AVE = 0.684)		
I can adapt to change.	0.866	4.761	2.093
I can deal with whatever comes.	0.832	4.465	1.942
I try to see the humorous side of problems.	0.866	4.563	1.813
Coping with stress can strengthen me.	0.853	4.704	1.894
I tend to bounce back after illness or a hardship.	0.641	4.239	1.895
I can achieve my goals despite obstacles.	0.802	4.789	1.999
I can stay focused under pressure.	0.642	4.887	1.896
I am not easily discouraged by failure.	0.925	4.676	1.919
I think of myself as a strong person.	0.882	4.662	1.978
I can handle unpleasant feelings.	0.827	4.521	2.075
Employee safety behavior	($\alpha = 0.944$, CR = 0.973, AVE = 0.947)		
<i>Safety compliance</i>			
I use safe equipment to perform my tasks.	0.947	2.549	1.202
I follow the correct procedures to finish the task.	0.909	2.549	1.242
I consciously prioritize safety in my job.	0.921	2.401	1.175
<i>Safety participation</i>			
I take part in additional activities to improve workplace safety.	0.958	2.444	1.123
I volunteered to take part in activities to improve workplace safety.	0.962	2.377	1.108
I volunteered to raise the security level of the organization.	0.932	2.504	1.229

Table 3. Heterotrait-monotrait ratio (HTMT) Matrix

No.	Variable	1	2	3	4	5
1	Overall well-being					
2	Safe behaviors	0.761				
3	Mental workload	0.612	0.717			
4	Physical workload	0.605	0.753	0.616		
5	Psychological resilience	0.144	0.094	0.106	0.127	

Table 4. Summary of the hypotheses – testing results

Hypothesis	Relationship	t-Value	Decision
H1	Physical workload -> Overall well-being	6.360	Supported
H2	Physical workload -> Safe behaviors	8.191	Supported
H3	Physical workload -> Overall well-being-> Safe behaviors	6.031	Supported
H4	Physical overload -> Mental workload	11.286	Supported
H5	Mental workload -> Overall well-being	7.866	Supported
H6	Mental workload -> Safe behaviors	6.587	Supported
H7	Mental workload -> Well-being-> Safe behaviors	5.677	Supported
H8	Psychological resilience -> Overall well-being	2.472	Supported
H9	Psychological resilience x Physical workload -> Overall well-being -> Safe behaviors	0.092	Not supported
H10	Psychological resilience x Mental Workload -> Overall well-being -> Safe behaviors	1.236	Not Supported
H11	Well-being-> Safe behaviors	9.802	Supported
H12	Psychological resilience -> Overall well-being-> Safe behaviors	2.387	Supported

Table 5. The mediation analysis results

Hypothesis	Total effects (IV->DV)			Direct effect (IV->DV)		Indirect effect (IV-> MV->DV)				Confidence Interval	
	β	t-value	p-value	t-value	P-value	β	SE	t-value	p-value	2.50%	2.50%
PW-> EW -> SB	-0.663	18.405	0.000	8.191	0.000	-0.144	0.024	6.031	0.000	-0.186	-0.092
MW -> EW -> SB	-0.411	9.922	0.000	6.587	0.000	-0.158	0.028	5.677	0.000	-0.214	-0.105
PsyResi-> EW -> SB	0.083	2.387	0.017	2.387	0.017	0.083	0.035	2.387	0.017	0.015	0.152

Note: SE: Standardized error; PW: Physical workload; EW: Employee well-being; MW: Mental workload; PsyResi: Psychological resilience

Figure 1. The proposed research framework

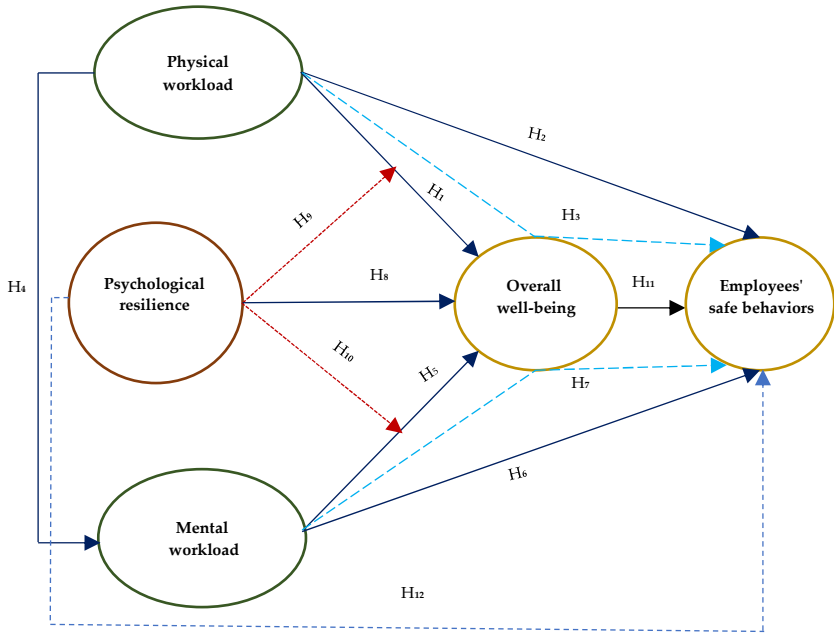


Figure 2. The results of the testing hypotheses

