Article

The Restorative Quality of the Work Environments: The Moderation Effect of Environmental Resources between Job Demands and Mindfulness

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Abstract: In the work context, employees must cope with everyday demands, which deplete psychological resources (e.g., direct attention and concentration). The environment's perceived quality (i.e., perceived restorativeness) helps people recover from job demands by restoring the psychological resources depleted during working hours. Therefore, this study examines the possible moderating effect of restorativeness (i.e., fascination and compatibility dimensions) between job demands (i.e., cognitive demands and work overload) and a specific form of attention, such as mindfulness, within the Job Demands–Resources Model. To achieve this aim, a cross-sectional study was conducted on a sample of 210 Italian employees working in five different sectors. They completed a self-report questionnaire in their work context. The hypotheses were verified with linear regression analyses, including age, gender, and hours per day worked as control variables. The findings show that cognitive demands are significantly and negatively correlated with mindfulness and that the demands–mindfulness relationship is weaker among employees who perceived greater restorative quality regarding "compatibility" with the work context. Conversely, work overload is not significantly correlated with mindfulness. Overall, these findings highlight the importance of considering the levels of restorativeness (i.e., compatibility) in the work context for indirectly enhancing mindfulness. In particular, a work environment with compatible characteristics can help employees recover from job demands.

Keywords: restorative environments; resources; mindfulness; cognitive demands; work overload

1. Introduction

In the work context, the need for recovery is a crucial predictor of relevant outcomes, such as well-being and performance (Verbeek et al. 2019). However, demands in the workplace, such as long working hours, high work pressure, and unfavourable physical and social environments, can negatively impact work outcomes, individual health, and perceived stress. Therefore, to increase their well-being and performance, employees must recover from job demands and replenish the psychological resources (e.g., energy, direct attention, concentration) they deplete during working hours (de Vries et al. 2017). Research has widely examined the role of job and personal resources in reducing the negative impact of job demands (for a meta-analysis, see Mazzetti et al. 2021). However, relatively few studies have examined the role played by the perceived features/properties of the work context. These physical and social properties (i.e., herein restorativeness) can help to restore employees' resources and reduce stress (Bellini et al. 2019) through the replenishment of direct attention (Kaplan 1995). Restorativeness is identified as a resource

of the environment able to re-establish specific cognitive capacities, such as attention and concentration (Hernández et al. 2001). Different studies show that restorativeness plays a crucial role in reducing stress and fatigue at work (Lee et al. 2018; Bellini et al. 2019) and improving attentional capacity and physical and psychological health (Carrus et al. 2015; Karjalainen et al. 2010). Therefore, examining the role of physical and social features/properties of the work environment in restoring employees' attention depleted during work is relevant. Although, as we have mentioned, research has given attention to the dynamics between environmental resources and demands and psychosocial outcomes in the work context, such as work stress and well-being, no studies have examined the buffering effect of the environmental quality of the work context between job demands and a specific kind of attention (i.e., herein mindfulness) in the work context. Thus, the novelty of this study is to extend the research on the role of perceived restorativeness in reducing the negative consequences of job demands on mindfulness at work.

Mindfulness is defined as "the awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the unfolding of experience moment by moment" (Kabat-Zinn 2003, p. 145). Research has shown that high levels of mindfulness allow individuals to cope with stress (Burton et al. 2017). Particularly, mindful people improve their emotional regulation (Lohani et al. 2020), increase attention (Hölzel et al. 2011) and the ability to recognize physical sensations (Good et al. 2016), and reduce the perceived stress in the workplace (Good et al. 2016; Ramaci et al. 2020). We adopted the Job Demands–Resources Model (JD–R Model; Bakker and Demerouti 2014) to examine the relationship between the constructs considered in this study. This model describes the relationship between job/personal resources and positive outcomes. Specifically, the model highlights the buffering effect of job/personal resources between job demands and different psychosocial and work-related outcomes.

In summary, this study investigates the negative effect of either work overload or cognitive demands on mindfulness and the moderating role of restorativeness on work overload and cognitive demands. We add to the existing literature by examining the role played by an environmental job characteristic (resource) of the work environment (i.e., restorativeness) in reducing the negative effect of job demands on a personal resource such as mindfulness on a sample of 204 employees.

2. Theoretical Background

2.1. Restorativeness as an Environmental Resource in the Work Context

The physical environment and its design can negatively or positively impact employee performance (de Vries et al. 2017; Shaari et al. 2022) and well-being (for a review, see Kazlauskaitė et al. 2022). For example, poor lighting, extreme temperature, high noise, and poor physical design (e.g., open-plan workplace, smaller office, windowless office, etc.) (Van Duijnhoven et al. 2019; Khazanchi et al. 2018) can affect employees' physical and psychological resources, increasing mental fatigue, concentration, and attention to work tasks. Conversely, some work environment characteristics can help employees to promote the restoration of those resources depleted during working hours. These features refer to the restorative quality of the environment, and they can be described as the physical resources that help people to recover from stress in meeting everyday demands, mainly promoting attention (Frumkin et al. 2017).

Referring to the aspects of the work environment, the qualities that positively impact depleted resources comprise the concept of restorativeness (Hartig et al. 1997). Restorativeness is defined as "the capacity of an environment to offer a concrete and available means of reducing suffering and enhancing effectiveness" (Kaplan and Kaplan 1989, p. 176). It can support the restoration of attentional resources (Kaplan 1995). Specifically, the Attention Restoration Theory (ART) shows that, in restorative environments through the fascination quality of the environment (i.e., the features of the environment that attract indirect attention without effort), direct attention is restored (Lin et al. 2019). More specifically, the perceived quality of physical environments (i.e., restorativeness) allows people to distract

themselves and relax and to experience a sense of freedom from everyday demands. Other environmental qualities described in the ART are being away (i.e., individuals feel that they are in different places and free their minds), compatibility (i.e., individuals perceive that the environment allows them to achieve their aims), and extent (individuals feel immersed in the place because they perceive familiarity with the features of the environment). These environmental qualities in the work context can be considered job resources because they help people to reach their aims, take psychological distance from depleting circumstances, and replenish psychological resources. The physical features of the work settings capture employees' involuntary attention and reduce mental fatigue, helping individuals cope with stress due to the use of voluntary attention (Kaplan 2001). Employees recover from mental fatigue and free the mental resources that allow them to meet environmental demands and maintain their attention to work tasks. In this regard, the Conservation of Resources (COR; Holmgreen et al. 2017) theory offers a theoretical framework to understand individuals' responses to stress and job demands. According to the COR theory, individuals try to gain and conserve or restore resources that are significant to them. Because of that, for example, to recover from stress, employees with environmental support can restore, maintain, or achieve new resources. The ART and the COR theories help to understand how individuals' perception of the physical working environment can support their ability to overcome the negative effect of objective features of the work context that, in some circumstances, employees cannot change.

Regarding restorativeness in the work setting, research has also shown its positive effect on performance (Jahncke et al. 2011; Lee et al. 2018) and the buffering effect of restorativeness between stress and fatigue (Lee et al. 2018; Bellini et al. 2019). The positive relationship between restorativeness and well-being has recently been verified in the academic context (Yusli et al. 2021). The process of resource depletion and restoration is described in the following section by referring to the JD–R model.

2.2. The Job Demands–Resources Model

The JD–R Model (Bakker and Demerouti 2014) describes the relationship between psychological work features (i.e., job demands and job/personal resources) and different work effects (e.g., performance) and personal determinants such as well-being (Zito et al. 2019). Work characteristics comprise job demands and job/personal resources. Job demands refer to the physical, psychological, or social aspects that require sustained physical or mental effort, such as an unfavourable physical environment. Instead, job resources refer to the psychological, social, or organizational characteristics that help individuals to achieve work goals, limiting the negative effect of job demands or stimulating personal development, such as environmental support.

Dual psychological processes explain the interactions between demands and job/personal resources: a stress process and a motivational process. A stress process due to excessive job demands or a lack of resources occurs when an individual's energy resources are depleted, or new resources are unavailable. This process drains mental resources or energy (Hobfoll et al. 2003) and may lead to exhaustion, health problems, and low performance (Bakker and Demerouti 2017; Pelon 2017).

Conversely, high job/personal resources enhance individuals' energy and may have positive impacts on work, such as performance (Taris 2017). This positive effect happens through the characteristics of the work context that offer sufficient resources to employees to use their skills to complete the work task and foster goal attainment.

Research has also shown that job/personal resources are antecedents of individuals' engagement and motivation (Bakker and Demerouti 2017) and can reduce the negative effect of job demands on positive outcomes (Van Wingerden et al. 2017; Dicke et al. 2018). A recent meta-analytic review (Lesener et al. 2018) confirmed the model's assumption.

Overall, we assume that job demands negatively impact job/personal resources, and the restorativeness of the work setting moderates the negative relationship between demands (i.e., herein cognitive demands and work overload) and resources (i.e., herein

mindfulness) in the workplace through replenishment of psychological resources by fostering psychological distance from a tiring work task.

2.3. Mindfulness

Mindfulness is defined as "a state of consciousness characterized by receptive attention to and awareness of present events and experiences, without evaluation, judgment, and cognitive filters" (Glomb et al. 2011, p. 119). It is an internal state (i.e., a personal resource) that confers superior self-regulation of the behaviours that play a primary role in helping individuals cope with job demands. Mindful individuals improve their capacity to sustain and regulate attention on the task and inhibit distraction (for a meta-analysis, see Sumantry and Stewart 2021). Specifically, mindful individuals focus on the present moment rather than on circumstances beyond their control (Brown and Ryan 2003). More specifically, mindful people who focus on their physiological responses reduce their emotional reactivity to psychological stress. When they experience negative events in the work context, they adopt a "decentred perspective" (Bishop et al. 2004). This mindful control state helps them to limit automatic responses and perceive stressors as less threatening. In other words, individuals who reappraise stressful circumstances develop greater control over the events and learn to adopt positive coping strategies that can support them in recovery from negative events (Crosswell et al. 2017).

Notably, researchers have found that mindful individuals perceive less stress and more well-being (Grossman et al. 2004; Eberth and Sedlmeier 2012; Burton et al. 2017) and increase their performance (Shonin et al. 2014). A recent review (Good et al. 2016) showed that a mindfulness control state improves communication and mood and reduces conflict emotional reactivity, perceived stress, and counterproductive behaviours.

In summary, although literature evidence shows that job demands (e.g., stress) negatively affect job/personal resources (i.e., mindfulness), as cited in the JD–R model section, little attention has been paid to the moderating role of restorativeness between job demand and mindfulness. Thus, we may expect that job demands (i.e., cognitive demands and work overload) negatively affect personal resources (i.e., mindfulness), while job resources (i.e., restorativeness) may buffer this negative relationship.

2.4. Study Aims and Hypotheses

This study examines the possible moderating effect of restorativeness on the cognitive demands or work overload and mindfulness relationship within the JD–R Model.

We propose four hypotheses:

Hypothesis 1. *Job demands (cognitive demands) are negatively associated with mindfulness.*

Hypothesis 2. *Job demands (work overload) are negatively associated with mindfulness.*

Hypothesis 3. *Restorativeness moderates the negative relationship of cognitive demands with mindfulness.*

Hypothesis 4. *Restorativeness moderates the negative relationship of work overload with mindfulness.*

3. Methodology

3.1. Procedure and Participants

We conducted a cross-sectional study among Italian employees from January 2022 to May 2023. The sample consisted of 210 employees. Participants were recruited in the researcher network from different organizations based on convenience and accessibility. The researchers personally visited the participants and administered the questionnaire (including socio-demographic information and questions related to the constructs considered in this study) in several small groups (comprising two to five participants for each group). They participated voluntarily and were informed of the main objectives of the research. Of

the 210 employees, 94 were men (44.8%), and 116 were women (55.2%). The average age of the employees was 42.9 years (SD = 9.9). The age of the participants ranged from 23 years to 66 years. Employees from 23 to 30 years of age were 13.3%, from 31 to 50 years of age were 61.5%, and from 51 to 60 years of age were 22.8%. Participants aged over 60 years were 2.4%. The participants worked in different sectors: administrative (38.6%), commerce (21.0%), training/education (12.4%), services (21.9%), and agriculture (6.2%).

The participants had two roles: employee (92.9%) and worker (7.1%). Workers provided support in the administrative (6.2%) and training/education (0.9%) sectors. Most participants (89.3%) spent 4 to 9 h at work daily, and the remaining spent 10 to 13 h per day (10.7%) at work. The mean hours per day worked were 7.19 (SD = 1.8).

3.2. Socio-Demographic Variables

The questionnaire included socio-demographic variables, such as sex (male = 1, female = 2), age (continuous variables), work sectors (categorized into five sectors: 1 = administrative; 2 = commerce; 3 = training/education; 4 = services; 5 = agriculture), role in the organization (categorized into two categories: employees = 1 and workers = 2), and working hours (categorized into two categories: from 4 to 7 h per day = 1 and from 8 to 13 h per day = 2).

3.3. Measures

This study considered four pre-existing measures (restorativeness, cognitive demands, work overload, and mindfulness). The participants responded to each item of the questionnaire on a Likert scale. Robitzsch (2020) argued that it is possible to consider ordinal variables as continuous regardless of the number of categories used to measure the construct and the marginal distribution of ordinal variables.

Restorativeness was evaluated using the Perceived Restorativeness Scale (PRS; Hartig et al. 1997) composed of 16 items rated on a 7-point Likert scale ranging from not at all (=0) to completely (=6). Examples of the items are "I would like to spend more time looking at the surroundings ", "Spending time here gives me a good break from my day-to-day routine", and "This place has fascination qualities" (see full scale, Table S1).

Job demands (Work overload and cognitive demands) were evaluated with the Job Content Questionnaire (JCQ) (Bakker et al. 2003, 2005). The scale was composed of 8 items: four of them referred to work overload and four to cognitive demands (Examples of the items are "My job requires working very hard" and "My job requires a lot of concentration" (see full scales, Tables 1 and 2, respectively). The participants answered the questions on a 5-point Likert scale from never (=1) to always (=5).

Table 1. Exploratory Factor Analysis for Work Overload.

Items	Factor Loadings	Communality
My job requires working very fast	0.465	0.291
I have too much work to do	0.750	0.293
My job requires to work harder than usual to meet a deadline	0.770	0.374
My job requires working under pressure		0.355
Eigenvalue	1.31	
Percentage of common variance	32.8	

Note: extraction method; principal axis factoring; rotation method, oblimin with Kaiser normalization. Loadings above 0.30 are shown; Kaiser–Meyer–Olkin test = 0.710, Bartlett's test of sphericity = 108.582, $p < 0.001$.

Table 2. Exploratory Factor Analysis for Cognitive Demands.

Items	Factor Loadings	Communality
My job requires a great deal of carefulness	0.899	0.733
My job requires a lot of concentration	0.856	0.807
My job requires work mentally very intense	0.828	0.686
My job requires constant attention	0.756	0.572
Eigenvalue	2.79	
Percentage of common variance	69.95	

Note: extraction method; principal axis factoring; rotation method, oblimin with Kaiser normalization. Loadings above 0.30 are shown; Kaiser–Meyer–Olkin test = 0.840, Bartlett's test of sphericity = 527.238, $p < 0.001$.

Mindfulness was measured with the Attention Awareness Scale (Brown and Ryan 2003), and the 15 items referred to receptive awareness and attention. Respondents rated each item on a 6-point Likert scale from almost always (=1) to almost never (=6). Examples of items from the scale are "Find myself doing things without paying attention" and "I get so focused on the goal I want to achieve that I lose touch with what I am doing right now to get there". Higher scores indicate higher mindfulness (see full scale, Table S2).

3.4. Data Analysis

First, we performed descriptive statistics to pre-investigate the data and evaluated the assumption of normality, multicollinearity, and linearity.

To assess the factorial structure of the measures, exploratory factor analysis (EFA) was performed using SPSS Version 20 for Windows. Cronbach's alpha was calculated to assess each scale's internal consistency. Reliability over 0.60 is considered "acceptable" (Pallant 2001).

Moreover, we identified the possible impact of the common method bias (CMB) by adopting Harman's one-factor analysis (Podsakoff et al. 2003). All measures in this study were loaded into an exploratory factor analysis to check if a single factor explained the majority of the covariance among the measures.

Hierarchical multiple linear regression with 1000 bootstrap resamples was used to evaluate our hypotheses (H1, H2, H3, H4). We tested four models with both predictors. Into the first model were entered socio-demographic variables such as age and gender, and context variables (sectors, hours per day worked) as control variables. In the second model, we included job demand variables (i.e., work overload and cognitive demands) as independent variables and mindfulness as the dependent variable. Lastly, we tested the moderating effect of restorativeness between cognitive demands and mindfulness and of restorativeness between work overload and mindfulness (i.e., work overload × restorativeness, compatibility or fascination, including them in the third model, and cognitive demands × restorativeness, fascination or compatibility, including them in the fourth model). The simple slope test was tested using the Process Macro for SPSS (Hayes 2012, 2017).

4. Results

As reported in Tables 1 and 2, the results of the exploratory factor analyses showed a one-factor structure for work overload and cognitive demands. Restorativeness showed five factors, and mindfulness showed two factors (as shown in Tables 3 and 4, respectively). The values of the items that did not show sufficient reliability or the factors composed by a single item were excluded from the subsequent analyses. Regarding the name of the factors, according to the Art Theory selected items, we named them as follows: fascination, compatibility, extent, and being away. Cronbach's alpha was 0.78 for restorativeness (fascination), 0.85 for restorativeness (compatibility), 0.53 for being away, and 0.38 for extent.

Table 3. Exploratory Factor Analysis for Restorativeness.

Items	Factors					Communality
	Fascination	Compatibility	Being Away	Extent		
My attention is drawn to many interesting things	0.832					0.653
There is much to explore and discover here	0.786					0.670
Being here is an escape experience	0.594					0.456
This place has fascination qualities	0.587					0.514
There is a great deal of distraction	0.385					0.302
Being here suits my personality		0.904				0.791
I have a sense that I belong here		0.765				0.710
I would like to get know this place better		0.640				0.653
I have a sense of oneness with this setting		0.623				0.628
I would like to spend more time looking at the surroundings			0.685			0.826
There is too much going on			0.323			0.263
It is chaotic here				0.778		0.563
It is a confusing place				0.323		0.231
Spending time here gives me a good break from my day-to-day routine					0.783	0.648
Eigenvalue	4.05	3.27	1.98	1.136	1.21	
Percentage of common variance	30.897	9.183	5.723	5.160	4.216	

Note: extraction method; principal axis factoring; rotation method, promax with Kaiser normalization. Loadings above 0.30 are shown; Kaiser–Meyer–Olkin test = 0.800, Bartlett's test of sphericity = 1314.8, $p < 0.001$.

Table 4. Exploratory Factor Analysis for Mindfulness.

Items	Factors		Communality
	1	2	
It seems I am running on automatic without much awareness of what I am doing	0.699		0.542
I tend not to notice feelings of physical tension or discomfort until they really grab my attention	0.656		0.388
I forget a person's name almost as soon as I've been told for the first time	0.642		0.255
I tend to walk quickly to get where I'm going without paying attention to what I experience along the way	0.616		0.564
I find myself listening to someone with one ear, doing something else at the same time	0.471		0.171
I do jobs or tasks automatically, without being aware of what I'm doing		0.916	0.475
I find it difficult to stay focused on what's happening in the present		0.559	0.429
I rush through activicties without paying attention to what I experience		0.477	0.598
Eigenvalue	3.06	0.803	
Percentage of common variance	25.5	6.69	

Note: extraction method; principal axis factoring; rotation method, promax with Kaiser normalization. Loadings above 0.30 are shown; Kaiser–Meyer–Olkin test = 0.876, Bartlett's test of sphericity = 1109.549, $p < 0.001$.

Cronbach's alpha was 0.90 for cognitive demands, 0.66 for workload, 0.67 for mindfulness (factor 1), and 0.58 for mindfulness (factor 2). Based on the results of the EFAs, the individuals' responses were summed to create a composite score for each factor. We then calculated descriptive statistics and bivariate correlations and performed the regression analysis.

The Kaiser–Meier–Olkin (KMO) values were over 0.8 for restorativeness, mindfulness, and cognitive demands and over 0.7 for work overload. The Bartlett Sphericity test results were statistically significant for each variable considered in this study ($p < 0.001$).

The assumption of normality, multicollinearity, and linearity were respected. Skewness and Kurtosis values ranged from -2 to $+2$ (see Table 5). The Mahalanobis distance did not identify multivariate outliers. The higher value of the Mahalanobis distance was 17.90 (chi^2 = 20.51 $p < 0.001$). The analyses of multivariate normality were checked with Mardia's test. The square of the Mahalanobis distance was 34.74. This value was lower than Mardia's index (=35); thus, we assume that the data came from a normal distribution. The Variance Inflation Factor (VIF) ranged from 1.07 to 1.17, indicating that the multicollinearity was not a concern in this study.

Table 5. Values of Skewness and Kurtosis for all the measured variables.

Variables	Skewness	Standard Error	Kurtosis	Standard Error
Work overload	0.750	0.168	-0.230	0.334
Cognitive Demands	-0.027	0.171	-0.376	0.341
Restorativeness (fascination)	-0.408	0.168	-0.003	0.334
Restorativeness (compatibility)	-0.680	0.168	-0.640	0.334
Mindfulness	-0.144	0.168	-0.274	0.334

The results of the correlations and descriptive statistics are shown in Table 6. Mindfulness was significantly negatively correlated with cognitive demands and work overload. Restorativeness (fascination) was significantly negatively correlated with work overload and cognitive demands and positively correlated with mindfulness. Restorativeness (compatibility) was significantly negatively correlated with work overload and cognitive demands and positively correlated with mindfulness. Further, referring to the control variables, negative and significant correlations between sectors, compatibility, cognitive demands, and work overload were found.

Table 6. Study Variables: Descriptive Statistics and Bivariate Correlations (N = 210).

	M	SD	1	2	3	4	5	6	7	8	9
1. Age	49.9	9.91	1								
2. Gender	-	-	-0.116	1							
3. Sectors	-	-	-0.152 *	-0.040	1						
4. Hours per day worked	7.18	1.79	-0.253 **	-0.194 **	-0.139 *	1					
5. Cognitive Demands	3.85	1.08	0.232 **	-0.066	-0.145 *	0.020	1				
6. Work Overload	3.54	0.67	0.151 *	-0.066	-0.160 *	0.122	0.322 **	1			
7. Fascination	-	1.31	-0.128	-0.048	0.183 **	-0.048	-0.520 **	-0.247 **	1		
8. Compatibility	2.35	1.71	-0.135	0.046	0.221 *	-0.015	-0.621 **	-0.175 **	0.547 **	1	
9. Mindfulness	3.94	1.00	-0.109	0.013	0.091	0.029	-0.406 **	-0.181 **	0.451 **	0.381 *	1

Note: * $p < 0.05$; ** $p < 0.01$.

The EFA shows five factors rather than one factor. The variance extracted by the main factor was 27.298% of the total variance. Thus, the covariation among the variables was not inflated, and the common method bias was not an issue in this study.

The results of the hierarchical regression analysis did not show a significant relationship between gender, sectors, and hours per day worked with mindfulness (F > 0.05). All the control variables did not show a significant effect with mindfulness in the second, third, and fourth models either.

The results showed that cognitive demands were negatively related to mindfulness (F < 0.05) but did not show a negative relationship between work overload and mindfulness (F > 0.05), as reported in Table 7. Thus, H1 was supported. The findings did not confirm H2.

Table 7. The hierarchical regression results of the association of socio-demographic, contextual variables, and perceived restorativeness (fascination and compatibility) with mindfulness (N = 210).

	Fatigue											
	Model 1			**Model 2**			**Model 3**			**Model 4**		
Model 1	β	t	p	β	t	p	β	t	p	β	t	p
Age	−0.104	−1.377	0.204	−0.010	−0.139	0.900	−0.006	−0.087	0.941	0.011	0.160	0.892
Gender	0.021	0.288	0.779	0.032	0.486	0.631	0.037	0.564	0.588	0.042	0.647	0.522
Sectors	0.084	1.156	0.268	0.006	0.087	0.934	0.001	0.015	0.986	0.000	0.000	1.000
Hours per day worked	0.032	0.419	0.698	0.060	0.890	0.408	0.062	0.902	0.403	0.065	0.964	0.358
Model 2												
Work overload				−0.003	−0.040	0.967	0.029	0.404	0.703	−0.004	−0.051	0.950
Cognitive Demands				−0.191	−2.224	0.045	−0.223	−2.507	0.031	−0.266	−2.900	0.013
Fascination				0.305	3.872	0.001	0.281	3.492	0.001	0.267	3.336	0.001
Compatibility				0.088	1.034	0.269	0.089	1.037	0.272	0.140	1.590	0.075
Model 3												
WO × Fascination							0.006	0.079	0.931	0.053	0.669	0.408
WO × Compatibility							0.093	1.187	0.277	−0.023	−0.253	0.816
Model 4												
CD × Fascination										−0.071	−0.912	0.284
CD × Compatibility										0.228	2.393	0.023
Adjusted R^2	0.004			0.224			0.224			0.239		
Omnibus test of the regression	$F(4, 197) = 0.321$			$F(4, 193) = < 0.001$			$F(1, 191) = 0.375$			$F(2, 189) = 0.58$		

Moreover, the findings reveal the moderating effect of restorativeness (compatibility) between cognitive demands and mindfulness ($\beta = 0.228$, 95% CI = 0.01 to 0.350, t = 2.393, $p < 0.001$). Specifically, the test of the simple slopes indicated that, when employees perceived low or average levels of restorativeness, cognitive demands negatively affected mindfulness, respectively ($\beta = −0.525$, 95% CI = −0.74 to −0.31, t = −4.82, $p < 0.001$ and $\beta = −0.335$, 95% CI = −0.50 to −0.16, t = −3.94, $p < 0.001$). On the contrary, when employees perceived higher restorativeness, there was a non-significant relationship between cognitive demands and mindfulness ($\beta = −0.14$, 95% CI = −0.30 to 0.01, t = 1.76, $p = 0.078$).

In model 3, the results did not show the moderating effect of restorativeness (compatibility) between work overload and mindfulness ($p > 0.05$). Further, the results in models 3 and 4 did not confirm the moderating effect of restorativeness (fascination) between work overload, cognitive demands, and mindfulness ($p > 0.05$). Therefore, the findings supported H3 but did not support H4.

5. Discussion

The current research was conducted to examine and advance the understanding of the role of perceived restorativeness in buffering the negative effect of cognitive demands and work overload on mindfulness. The indirect effect of the characteristics of work environments on mindfulness has not yet received sufficient attention. Aligned with previous studies (Bellini et al. 2019; Sumantry and Stewart 2021), cognitive demands negatively affect job/personal resources such as mindfulness (H1). In contrast with our hypothesis, the results did not reveal an association between work overload and mindfulness (H2). Further, as expected, we found the moderating effect of restorativeness between cognitive demands and mindfulness (H3). Specifically, our findings showed that the negative effect of cognitive demands on mindfulness was weaker for those individuals who perceived higher "compatibility". However, the moderating effect of the "fascination" quality of the workplace was not significant. In addition, counter to our expectations, the moderating effect of restorativeness (i.e., fascination and compatibility) between work overload and mindfulness was not supported (H4). The results of the present research aligned with the JD–R Model (Bakker and Demerouti 2014, 2017), which highlighted the positive effects of resources on other resources and positive outcomes at work, as confirmed in a recent meta-analysis (Mazzetti et al. 2021) and with the findings of previous studies that found that restorativeness allows for a reduction in the adverse effect of job demands (Lee et al.

2018; Bellini et al. 2019) and improves attentional capacity (Lin et al. 2019), well-being (Carrus et al. 2015; Yusli et al. 2021), health (Karjalainen et al. 2010), and performance (Lee et al. 2018). Our findings are relevant for employees who need to replenish the resources depleted during working hours and, in a particular way, to improve mindfulness at work. However, further research should be conducted to strengthen our findings.

Regarding the non-significant effect of work overload on mindfulness compared to the positive effect of cognitive demands on mindfulness, this result may depend on the employees' perception of the work tasks. Although job demands are generally considered a "hindrance" and commonly associated with adverse outcomes, in some circumstances, they can work as "challenge demands", which require an effort but can also support personal growth (Lesener et al. 2018) and be less negatively related with a positive outcome (Li et al. 2017). Recent studies corroborated this interpretation (LePine et al. 2005, 2016; Peikai et al. 2020). LePine et al. (2005, 2016) highlighted how challenging stressors can foster personal growth and generate challenging conditions that can help in achieving goals. Similar results were obtained by Peikai et al. (2020). However, it would be necessary to verify if our findings can be extended to jobs with low cognitive demands and high physical demands.

Examining the lack of moderation effect of fascination on demands and mindfulness, we observe that the items of this sub-dimension of perceived restorativeness refer to a "form of distraction" (e.g., there is a great deal of distraction) and may not be able to promote attention.

6. Conclusions and Practical Implications

Employees are exposed to many job demands, which can have negative consequences on work performance and well-being. This study suggests that the quality of the environment (being in a place compatible with individual differences) can alleviate these negative consequences. Thus, this study addressed the protective role of the perceived work environment, specifically restorativeness. In addition, our findings suggest exploring and understanding the work features compatible with individual differences.

Furthermore, this study expands on the previous research and shows that an environmental resource of the work environment, such as restorativeness and its properties, has a crucial role in reducing the negative impact of cognitive demands on mindfulness. This result may have relevant and practical implications for employees, employers, and human resource managers. Notably, they might observe which features of the physical work context offer a supportive restorative experience, helping individuals maintain their focus on the work tasks. These properties relate to "compatibility" and allow employees to get to "know the place better" and feel that the workplace "suits their personality" and goals. This information can be used to emphasize the crucial role and benefit of the work environment in restoring attention and building workplace programs and policies.

Finally, the results shed light on the importance of allowing employees to choose where they work. Working remotely can help individuals feel "home". In an interesting research study, Pasini et al. (2021) pointed out that built spaces can be restorative environments with effects on well-being similar to those generated by natural environments. This positive effect can be achieved through a participatory interior design process that involves employees. Lastly, in a systematic review, Gritzka et al. (2020) point out that nature-based workplace interventions can promote health. Theodorou et al. (2023) demonstrated the effectiveness of virtual natural environments in improving subjective vitality through restoration with possible applications to the workplace.

Limitations and Future Research

Although the results consistently support the study hypotheses, some limitations exist in this research and should be considered. First, we applied a cross-sectional design that precludes the possibility of ensuring a causal relationship between measures. Regarding this last point, future longitudinal design studies are needed to analyse the changes throughout

working time and to make inferences regarding the association between restorativeness and other job and personal resources and job demands.

Second, the self-reported measurement method can be influenced by the common method bias and related social desirability. Third, we did not examine the possible effects of other job resources/personal resources interaction with restorativeness on other outcomes or its possible mediating effect on the relationship between job demands and mindfulness. Finally, this study was conducted with a small sample of convenience made up of Italian employees. The participants were selected by the researchers within their network. Therefore, it is not guaranteed that every employee in the entire population could be involved in the research. Future research should extend the sample population to other countries to generalize the results.

Finally, further studies should investigate which specific elements of the physical work context can restore job resources. A specific questionnaire to identify the environmental quality of the work context should be developed. The instrument's questions could be developed for job and/or specific work sectors.

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