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The intersectional effects of motivational and affective factors on managers'

performance

Abstract

Purpose: Drawing from the effort-recovery model, the authors analysed the role of daily sleep quality as a driver for self-regulatory resources and consequently of task and contextual performance. Specifically, the authors hypothesised that self-regulatory resources would be a potential mechanism for enhancing workers' performance after a good night's sleep. Moreover, relying on the COR theory, the authors proposed health-related indicators (mental health and vitality) as intensifiers of the previously proposed indirect effect.

Design/methodology/approach: Daily diary data were collected from 97 managers over five consecutive working days (485 daily observations) and analysed using multilevel path analyses.

Findings: Sleep quality was positively associated with managers' self-regulatory resources and (task and contextual) performance at the person and day levels. Additionally, results provided support for most of the assumed indirect effects of sleep quality on both performance dimensions via self-regulatory resources. At last, the findings evidenced that these indirect effects were moderated by health indicators in a way that lower scores on health intensified such positive effects.

Practical implications: Organisations should create mechanisms that could promote their workers' awareness of the potential benefits of sleeping well at night as well as its impacts on both self-regulatory resources and performance. The current intensification of workload together with working after hours may pose a risk to this important resource source for managers.

Originality/value: These findings emphasise the day-to-day variation in self-regulatory resources needed to perform and that workers' sleep quality has the potential to stimulate a resource-building process for such benefits.

Keywords: Sleep quality; regulatory resources; subjective vitality; mental health; performance; multilevel modeling.

Introduction

With the pandemic crisis experienced since 2020, there has been a significant increase in stress and anxiety levels (Junça-Silva, & Silva, 2022), which has led to a consequent decrease in sleep quality, motivation, and performance (Rivkin et al., 2021).

Sleep has been defined as "a condition of body and mind that normally recurs for several hours each night, in which the nervous system is inactive, eyes closed, postural muscles relaxed, and consciousness practically suspended" (Friese, 2020, p. 94). Sleep is a crucial recovery experience that significantly influences the working day (Barnes, 2012), and facilitates performance (e.g., Henderson & Horan, 2021; Litwiller et al., 2017).

The self-control theory (Barnes, 2012; Muraven & Baumeister, 2000) explains the influence of sleep quality on worker performance; it suggests that self-regulation – the control of impulses, desires, and emotions to achieve long-term goals – depends on the availability of self-regulatory resources (Muraven & Baumeister, 2000). These refer to the set of internal resources that determine the ability to control and regulate emotions, mental states, and behaviors in any situation (Baumeister et al., 2000; Muraven & Baumeister, 2000).

Based on the Conservation of Resources Theory (COR; Hobfoll et al., 2018), we consider that certain resources can act as amplifying or dampening conditions of the relationship between sleep quality and performance through regulatory resources. It suggests that individuals develop active efforts to protect their resources, and on the other hand, the loss of resources triggers a defensive state to protect the remaining resources and avoid further losses. This state is characterized by the goal of conserving and protecting an individual's remaining resources, for example, refraining from activities that may further drain their resources. Based on this theoretical argument, we

propose that mental health – an indicator of affective resources (Watson et al., 1988) – and subjective vitality – an indicator of motivational resources (Ryan & Deci, 2008; Ryan & Frederick, 1997) – will function as moderators of the relationship between sleep quality and performance through regulatory resources (Quinn et al., 2012). The individual's affective and motivational conditions can interact with regulatory reactions intensifying his/her performance, since the individual, after a good night's sleep, can have better performance since s/he will also be able to have greater control over their regulatory resources, in particular when feeling better (mental health) and motivated (vitality).

Studies analysing the interaction between self-regulatory resources (cognitive resources) and affective and motivational resources are scarce. Hence, this study aims to expand knowledge about the psychological mechanisms that link sleep quality to work performance and intends to (1) test the mediating role of self-regulatory resources in the positive relationship between daily sleep quality and performance (contextual and task) and (2) examine the moderating role of daily affective (mental health) and motivational (subjective vitality) resources in former indirect effect.

The present study is relevant as it expands knowledge about a psychological mechanism that links sleep quality to performance; provides evidence of the importance of healthy sleep for performance, but so far little explored. The fact that sleep is a basic human need increases the importance of being explored in its intersection with daily life at work. In this way, the present study can constitute a starting point for organizations that are concerned about the quality of sleep of their employees, with the repercussions that this can bring and that seek guidance based on empirical evidence.

Theoretical background and hypotheses development

The relevance of sleep quality

Sleep is an involuntary process, but essential as it allows the regeneration of physical and mental energy for the effective functioning of employees in their daily tasks (e.g., Robotham et al., 2011).

Sleep research has demonstrated that both sleep quantity and subjective quality are important dimensions of sleep (e.g., Akerstedt et al., 1994). Sleep quality refers to "(…) quantitative aspects of sleep, such as sleep duration, sleep latency or the number of awakenings, as well as more purely subjective aspects such as sleep depth or rest" (Buysse et al., 1989, p. 194).

Sleep quality has been demonstrated to be a predictor of positive behavior at work (e.g., Afonso et al., 2017). Some authors have emphasized the relevant role of sleep after a working day full of job demands, as the human body and mind need to restore energy and cognitive resources through sleep (Schaufeli & Taris, 2014). On the opposite, poor quality of sleep can influence the short term: tiredness and daytime sleepiness; irritability; mood swings; loss of memory of recent events; loss of creativity; low ability to plan and execute tasks; slower thinking ability; inattention and difficulty concentrating (Barnes, 2012). In the long run, it seems to influence premature aging; compromised immune system; physical vigor and decreased muscle tone; tendency to develop obesity; diabetes; cardiovascular and gastrointestinal diseases, and memory loss (Purim et al., 2016).

Evidence has shown that most employees regularly sleep less than the recommended time (i.e., seven/nine hours per night; Litwiller et al., 2017). For instance, the National Sleep Foundation (2013) showed that between 40 and 60 percent of the working population sleeps less time than necessary during workdays. The factors that harm a good quality of sleep are excessive working hours, social relationships, and high job demands (e.g., Fatima et al., 2016; Nakashima et al., 2011). Another study

demonstrated that those who worked more than 48 hours a week had a worse sleep quality index and more symptoms of depression relative to those who regularly worked up to 40 hours a week (e.g., Afonso et al., 2017).

The mediating role of self-regulatory resources

A good night's sleep is crucial for the recovery, and regeneration of regulatory resources which, in turn, contributes to work performance (Higgs, 2019). Performance is a behavioral construct and a multidimensional concept, distinguished by task and contextual performance. Task performance is associated with workers' contributions to organizational productivity and takes part in the formal reward system and the function's prerogatives (Parker et al., 2006). Contextual performance is the type of behavior that is not directly aligned with, or does not directly contribute to, organizational productivity, but its role in supporting the organizational, social, and psychological environment is of utmost importance.

Considering that sleep can facilitate/hinder a worker's effectiveness, having slept poorly can be highly detrimental to work (e.g., Henderson & Home, 2021). The theory of self-control supports this relationship (Barnes, 2012; Muraven & Baumeister, 2000). It suggests that self-regulation – resources that allow the control of impulses, desires, and emotions – is essential to reach the desired level of performance. Accordingly, performance depends on the availability of self-regulatory resources (Muraven & Baumeister, 2000). In addition, sleep is a process that allows for restoring these resources (Barnes, 2012) facilitating the next-day workers' performance (Lian et al., 2017). In other words, sleep restores self-regulatory resources and allows the worker to resist distractions more successfully and concentrate more on their tasks or persist when they become more demanding (Schmidt & Neubach, 2007).

Similarly, the Effort-Recovery model (Meijman & Mulder, 1998) suggests that a good quality of sleep allows the recovery of lost or depleted energy resources during the day and that it makes employees more predisposed to perform better during the day. next at work. That is, when there are regulatory resources, employees are more motivated and willing to exert efforts to effectively perform their tasks, leading to better daily performance.

Some studies have shown a positive link between sleep quality and self-regulation (e.g., Lanaj et al., 2014) and resource availability (e.g., Schmitt et al., 2017). Employees who often value healthy sleep habits, replenish more of their cognitive resources allow greater impulse control, and, consequently, are able to perform better at work (e.g., Pilcher et al., 2015). Another study showed that good quality sleep recovered regulatory resources and, consequently, improved workers' performance (e.g., Barnes et al., 2017). The availability of resources restored by good sleep quality is important for the effectiveness of employees, as these resources ensure that they are more committed to their tasks and successfully fulfill work goals (e.g., Lord et al., 2010). Indeed, having regulatory, affective, and motivational resources available seems to be related to workers' ability to concentrate and focus on tasks, as they become less vulnerable to a lack of concentration, impulsive behavior, and distractions of concern outside of the task, which can inhibit the initiation and development itself. task execution (e.g., Beal, et al., 2005). In addition, regulatory resources help to motivate workers to perform less satisfactory tasks and high levels of job demands (Diestel & Schmidt, 2011). Also, the availability of regulatory, affective, and motivational resources are indicators of high levels of performance at work (e.g., Kuähnel et al., 2012), personal initiative and behaviors of organizational citizenship or extra-role (e.g., Binnewies et al., 2009). While sleeping, energy resources are restored and are available

to employees when they return to work the next day, which allows them to perform better.

Based on the effort-recovery model and the empirical studies, we argue that sleep quality contributes to next-day job performance, through the availability of self-regulatory resources (e.g., James et al., 2018). Thus, we define the following hypotheses:

H1. Sleep quality will be positively related to (a) task and (b) contextual performance via self-regulatory resources at the within-person level.

The moderating role of motivational factors

When we talk about the relationship between sleep quality and work performance through regulatory resources, we cannot ignore the inter-individual and intra-individual differences that may contribute to altering the strength or direction of this relationship. Several recent studies have emphasized the role of health (e.g., subjective vitality or mental health) as an individual condition that can either facilitate or hinder work performance (e.g., Bulińska-Stangrecka & Bagieńska, 2021).

Subjective vitality is defined as the way to obtain physical and mental energy, that is, it is a state of enthusiasm, vivacity, and available energy (Ryan & Frederick, 1997). This is related to vigor, high activation positive affect, and positive energy (Thayer, 1996). According to Ryan and Frederick (1997), subjective vitality refers to positive states of vivacity and personal energy. Considering the theory of human functioning, vitality includes psychological and somatic aspects, becoming an indicator of motivation (Niemiec et al., 2010).

Thayer (1987) argued that having positive energy can help individuals to avoid or minimize the negative impact of personal problems by helping them to focus more on

daily tasks at work. Similarly, studies by McNair et al (1971) showed that vitality had a negative relationship with depression, tension, anger, and confusion.

Although it is considered a subjective and dynamic state, that is, fluctuating between individuals, vitality is strongly linked to goal-oriented behaviors (Rivkin et al., 2021) as it is significantly related to the state of brain activation and mechanisms of positive responses (e.g., Rozanski, et al., 2005). When they are in higher states of vitality, employees tend to be more active and productive, in addition to being able to better deal with stress and challenges (e.g., Rivkin, et al., 2021). Evidence also shows that people with high vitality have conditions that facilitate resilience in the face of physical stress factors and even in these situations they manage to achieve better performances, (e.g., Polk et al., 2005). Therefore, vitality seems to be an important individual condition that could facilitate the relationship between sleep quality and work performance through regulatory resources.

Based on the evidence shown, we defined the following hypothesis:

H2. Vitality will moderate the positive relationship between sleep quality and (a) task and (b) contextual performance via self-regulatory resources, in such a way that the relationship will be stronger for those who have higher levels of vitality (versus lower levels).

The moderating role of affective factors

Mental health is a determinant of general health, well-being, and resilience. According to the World Health Organization (WHO, 2005), mental health refers to a state of well-being in which a person prioritizes the use of his or her abilities, seeks to face daily stress, works productively, seeks to achieve their potential and make its contribution to the community in which it operates.

When mental health issues are poorly managed, individuals' thinking, feelings and behavior can be negatively affected. Therefore, mental health can influence the way people function in different spheres of life, even with regard to relationships, quality of life, motivation, and performance.

According to the theory of Conservation of Resources (Hobfoll, 1989, 2002), people seek to obtain, retain and protect their resources, however, performance is threatened when there is a loss of these resources, that is, when people after an exhausting job, they don't have time to recover these resources (e.g., through sleep). Still, it is crucial to look for conditions that facilitate even in situations of loss of resources, such as mental health or vitality. That is, success in these situations depends on the ability that each person must acquire and protect their resources (Hobfoll, 1989, 2002). Thus, both mental health and vitality are essential resources for the individual to be able to acquire more resources or avoid losing them. For example, since mental health is an indicator of resilience (WHO, 2005), it can be assumed that the resilient individual will be able to deal with unexpected adversities in their workday with ease, managing under these conditions to successfully carry out their tasks.

According to the broaden-and-build theory (Frederickson, 2000), positive affective experiences have a positive influence on people's thought-action as they can increase their attention, cognition, and action, helping to build physical and mental resources. and social (Frederickson & Losada, 2005). Employees with mental health are happier and have more ability to seek, protect and conserve their resources, becoming more creative, resilient, and productive (Frederickson & Losada, 2005). In short, mentally healthy individuals have to enable conditions to achieve their goals and adapt to the different circumstances of working life (Avey et al., 2010).

Hence, it is expected that individuals with high levels of mental health will be able to derive more benefits from the positive relationship between sleep quality and performance, through increased regulatory resources. Thus, we define the following hypothesis (see Figure 1).

H3. Mental health will moderate the positive relationship between sleep quality and (a) task and (b) contextual performance via self-regulatory resources, in such a way that the relationship will be stronger for those who have higher levels of mental health (versus lower levels).

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Method

Procedure and participants

In this daily-diary study, participants completed one general survey and, over five consecutive workdays, one daily survey. All questionnaires were filled out online.

We recruited managers through our private professional networks. They were contacted via e-mail and were asked to answer the email if they were interested to participate in a study about "sleep quality". Then, those who replied to the email received another one with information about the data-collection process and a link to a general online survey for gathering demographic data. They were asked to select one of four weeks for participating in a diary study. At the beginning of the selected week, participants were asked to answer a short online survey, every day, for five consecutive days (from Monday to Friday). They were instructed to answer this survey at the end of the working day, up to 9 pm.

Overall, 123 managers participated in our study. Of these participants, 13 (10.5%) answered only one diary survey, 7 (5.6%) responded to it on two days, 2 (1.6%) participated on three days, 4 (3.2%) answered four daily surveys, and 97 (78.8%) completed it every day for five working days. Hence, we only kept the 97 participating managers (485 measurement occasions). Their mean age was 33.63 years old ($SD=9.61$). They were predominantly male (85.4%), and working an average of 40 hours per week ($SD=12.13$). Years of work experience ranged from one year to 30 years. Mostly, they were working in their organisations that ranged between six and 13 years (65.5%). Regarding education, 88% held a university degree and 12% had vocational education.

Measures

General survey

The general survey included socio-demographic information regarding age, sex, tenure, habilitations, organizational contract, and the average number of working hours per week.

Daily survey

For this study, all the items were adapted for day-level assessment so that they referred to daily experiences suitable for the study's diary design. We added "today" in each item and worded them in the past tense.

Sleep quality. To measure sleep quality, the Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989) was used. It measures sleep duration, efficiency, and latency through five items (e.g., "Last night, how would you rate the quality of your sleep? Last night, how many hours did you sleep? Last night, how long did it take you to fall asleep?"). The answers were given according to the number of hours and minutes and

also based on a 5-point Likert scale ranging from (1) *Very bad* to (5) *Very good*. Cronbach's alpha varied across the five workdays from 0.79 to 0.82.

Self-regulatory resources. To assess self-regulatory resources, three items from the Twenge state self-control capacity scale (Christian & Ellis, 2011) were used. A sample item is "Today, I felt mentally exhausted." Items had to be answered on a 5-point scale ranging from 1=*strongly disagree* to 5=*strongly agree* Cronbach's alpha ranged between 0.92 and 0.97 over the days.

Task and contextual performance. To assess task and contextual performance, we used six items from the brief version of the Individual work performance questionnaire (Koopmans et al., 2012; Ramos-Villagrasa et al., 2019). A sample item assessing task performance is "Today, I managed to plan my work so that I finished it on time" and for contextual performance: "Today, I took on challenging tasks when they were available". Participants had to respond using a five-point Likert scale, ranging from *rarely* (1) to *always* (5). Cronbach's alpha varied across the five workdays from 0.77 to 0.83.

Health. To assess mental health and vitality, we used nine items from the SF-36v2 (Were et al., 2007). The 4-item vitality subscale assessed perceived energy versus general fatigue (e.g., "How much of the time during today…Did you feel full of pep?). In addition, the mental health subscale is a 5-item scale commonly used as a measure of psychological functioning (e.g., "How much of the time during today…have you felt downhearted and blue?"), and four measured subjective vitality. Higher scores indicated better functioning (that is, better psychological functioning and higher vitality, and lower fatigue). Items were scored on a 5-point Likert scale, ranging from *none of the time* (1) to *all of the time* (5). Cronbach's alpha varied across the five days (Mental Health: $0.87 > $ Cronbach's alpha < 0.90; Vitality: $0.90 > $ Cronbach's alpha $= 0.93$).

Data analyses

This study used multi-level analysis with nested data to examine the underlying model. Thus, Therefore, we applied multilevel path analyses to test the hypotheses using the macro- Multilevel Mediation (MLMed), in SPSS (Rockwood, 2017). All hypotheses were tested at the within-person level (Level-1).

To determine whether our hypotheses of moderated mediation were supported, we calculated the index of moderated mediation (Hayes, 2015). A significant index of moderated mediation shows that the indirect effect is dependent upon the levels of the moderator variable (vitality and mental health). With this approach, "inference is based on the size of the index of moderated mediation rather than a set of two or more inferential tests about components of the model" (Hayes, 2015, p. 3) and, thus, represents a direct quantification of the association between the indirect effect and the proposed moderator of such effects.

Results

Preliminary analyses

Proportions of within- and between-person variance of the variables (with $ICC_{(1)}$ ranging between 0.39 and 0.72) indicated substantial within-person variation, justifying multilevel analyses. Table 1 presents intraclass correlations, means, standard deviations, and correlations for all study variables.

--TABLE 1--

To test for common method bias, multilevel confirmatory factor analyses were performed using JASP. The results showed that the six-factor model (sleep quality, self-regulatory resources, task, and contextual performance, vitality, and mental health) fit the data well (both within- and between-person levels: RMSEA=0.07, CFI=0.90, TLI=0.91, $SRMR_{intra}$=0.05, $SRMR_{inter}$=0.07). On the other hand, the single-factor model

showed an unacceptable fit to the data (RMSEA=0.13, CFI=0.60 TLI=0.57, SRMR$_{intra}$

=0.10, SRMR$_{inter}$=0.11).

Hypotheses Testing

Indirect effect models. Hypothesis 1a tested the mediating role of regulatory

resources on the relationship between sleep quality and contextual performance, at the

daily level. Sleep quality negatively correlated with regulatory resources (γ=-0.82,

p<0.001). Daily regulatory resources positively correlated with daily contextual

performance (γ=0.62, p<0.001), with a significant indirect effect (γ=-0.51, p<0.001)

(95%CI [-0.67, -0.36]). Thus, Hypothesis 1a was supported by the data.

Hypothesis 1b tested the mediating role of regulatory resources on the

relationship between sleep quality and task performance, at the daily level. Daily

regulatory resources positively correlated with daily task performance (γ=0.55,

p<0.001), with a significant indirect effect (γ=-0.46, p<0.001) (95%CI [-0.63, -0.29]).

Thus, Hypothesis 1b was supported by the data.

Moderated mediation models. Hypothesis 2a stated that vitality would moderate

the relationship between daily sleep quality, daily regulatory resources, and daily

contextual performance. The results show a significant conditional indirect effect of

vitality (γ=0.16, CI95% [0.11, 0.20]; we found that the mediating effect of daily sleep

quality on daily contextual performance via daily regulatory resources was enhanced for

individuals who scored lower on vitality (Figure 2). Thus, hypothesis 2a received partial

support.

-- FIGURE 2--

Hypothesis 2b stated that vitality would moderate the relationship between daily

sleep quality, daily regulatory resources, and daily task performance. The results

showed a significant conditional indirect effect of vitality (γ=0.14, CI95% [0.08, 0.19];

the mediating effect of daily sleep quality on daily task performance via daily regulatory resources was enhanced for individuals who scored lower on vitality. Thus, Hypothesis 3b received partial support.

Hypothesis 3a stated that mental health would moderate the relationship between daily sleep quality, daily regulatory resources, and daily contextual performance. The results show a significant conditional indirect effect of mental health (γ=0.15, CI95% [0.11, 0.19]; the mediating effect of daily sleep quality on daily contextual performance via daily regulatory resources was enhanced for individuals who scored lower on mental health. Thus, Hypothesis 3a received partial support.

Hypothesis 3b stated that mental health would moderate the relationship between daily sleep quality, daily regulatory resources, and daily task performance. The results showed a significant conditional indirect effect of mental health (γ=0.15, CI95% [0.10, 0.20], in particular, we found that the mediating effect of daily sleep quality on daily task performance via daily regulatory resources was enhanced for individuals who scored lower on mental health (Figure 3). Thus, hypothesis 3b was partially supported.

--FIGURE 3--

Discussion

This study develops knowledge about the intersection of sleep quality in the organisational context, in particular its effect on task and contextual performance. To this end, a daily diary study shows how and when it occurs, by conceiving self-regulatory resources as a mediating mechanism and affective (mental health) and motivational factors (subjective vitality) as moderators of the indirect relationship.

Overall, all hypotheses are supported; however, the moderated mediation models are partially in line with expectations as the lower levels of mental health and subjective

vitality appear to intensify the indirect effect of sleep quality on both task and contextual performance via self-regulatory resources.

Theoretical implications

Firstly, the results show the cognitive mechanism – self-regulatory resources - through which sleep quality influences both task and contextual performance, thus responding to how sleep quality affects managerial performance. That is, a good night's sleep can restore managers' self-regulatory resources, and these, consequently, increase their contextual and task performance. These findings are in line with the theoretical and empirical literature (e.g., Barber & Munz, 2011; Barber et al., 2010; Hagger, 2010). For example, the effort-recovery model developed by Meijman and Mulder (1998) supports the hypothesis and, consequently, the result. This suggests that workers invest resources to deal with their job demands; job demands lead to the depletion of personal resources (Meijman & Mulder, 1998), needing thereby recovery activities to restore lost resources during the working day. One of the key activities in resource restoration is getting a good night's sleep (Rivkin et al., 2021). Thus, a good night's sleep allows for replenishing lost or depleted self-regulatory resources during the day and these make employees more predisposed to more proactive behaviors, such as creativity, innovation, and cooperation. Accordingly, when people have a good night with sleep quality, they tend to restore their personal resources and, consequently, the likelihood of performing the function at optimal levels is higher, which positively impacts their task and contextual performance (Meijman & Mulder, 1998). Therefore, workers who are able to rest and get a night's sleep with quality are able to recover from work-related fatigue, increasing their self-regulatory resources (Meunier et al., 2019).

Self-regulatory resources – resources that allow the individual to control their behaviors, emotions, and impulses – facilitate performance as they reduce

counterproductive behaviors, and procrastination or minimize distractions not related to work (Niemiec et al., 2010). Schaufeli and Taris (2014) demonstrated that, after a working day with physical and mental effort, the human body and mind need to sleep to restore the cognitive resources needed to perform at higher standards (Higgs, 2019). Thus, getting a good night's sleep not only restores spent self-regulatory resources but also allows individuals to feel more motivated and willing to dedicate their efforts to successfully perform their daily tasks (e.g., Pilcher et al., 2015). The self-regulation theory also postulated that controlling impulses, desires, and emotions to achieve a high level of performance depends on the availability of self-regulatory resources (Muraven & Baumeister, 2000). Thus, sleep quality is assumed as a predictive factor in the recovery of cognitive resources for greater daily performance at work.

The results show the moderating role of subjective vitality in the relationship between sleep quality and performance (contextual and task) through daily self-regulatory resources, however not as expected. That is, the relationship is stronger for workers with lower levels of subjective vitality (versus higher levels). However, when analysing the results, it can be concluded that when sleep quality is weaker and, therefore, self-regulatory resources are not restored, individuals with more vitality are able to contribute more actively to contextual performance, whereas as self-regulatory resources increase, are those with lower vitality scores who are able to raise contextual performance most significantly. The same pattern holds for mental health moderation; that is, when the person fails to restore self-regulatory resources during the night's sleep, mental health seems to be a condition that facilitates contextual performance, however, as self-regulatory resources are recovered, mental health ceases to be a condition that facilitates contextual performance. In other words, health (vitality and mental health) is a condition so that, in the absence of efficient recovery of self-regulatory resources, the

individual can contribute positively to contextual performance. The JD-R can explain this finding. Accordingly, the balance achieved between resources and demands influences the motivational process that promotes the worker's engagement and performance (Bakker et al., 2014). Thus, if we think that little or no self-regulatory resources may be necessary, health conditions can be seen as the needed resources to deal with the demands of the job and, thus, improve contextual performance. However, as demands decrease (i.e., self-regulatory resources increase) it is likely that individuals will stop using their health resources (vitality and mental health) as a strategy to protect them, as self-regulatory resources will be enough to manage the effort and concentration required for contextual performance. We can also find theoretical support in the COR theory; it suggests that individuals seek to protect, acquire or maintain their personal resources (Hobfoll, et al., 2018). Thus, when self-regulatory resources are available, individuals can develop strategies to protect health resources, as regulatory resources will be sufficient to increase contextual performance.

Notwithstanding, the pattern of results in relation to task performance is different; the results show that when sleep does not sufficiently restore self-regulatory resources and these are, thereby, low, task performance is lower regardless of whether there are low or high health (vitality) resources. However, as self-regulatory resources increase, task performance becomes significantly higher for those with lower vitality levels. This result goes against what has been demonstrated in the literature. For example, studies by Pennix et al (2000) and Ryan and Frederick (1997) showed that employees are more active and productive when they are in excellent health conditions, in addition to being able to effectively deal with job demands. Other studies have shown that vitality energizes individuals helping them to deal with demands and stressful conditions as it creates conditions for higher concentration on daily tasks, which can

lead to better performance (task and contextual) (Kasser & Ryan, 1999; Ryan & Frederick, 1997). However, the results show that when there are enough self-regulatory resources, individuals do not need the vitality to manage their behavior regarding task performance.

On the other hand, the results also indicate that when sleep is not enough to restore self-regulatory resources, having a good mental health condition can facilitate task performance, however, as self-regulatory resources increase, mental health seems to be preserved as there seem to be no significant differences between lower and higher mental health levels regarding task performance. Thus, mental health appears to be a particularly relevant affective resource when self-regulatory resources are sufficient to regulate task behaviours. But, perhaps in an attempt to protect mental health resources, individuals use self-regulatory resources as a behavioural regulation mechanism in task performance. Cowen (1991) quoted by Ryan and Deci (2001) showed that mental health is an engine of positive aspects regarding the performance and involvement of workers in their daily tasks; plus, it also helps in the acquisition of cognitive resources that facilitate the greater task and contextual performance. Also, Frederickson and Losada (2005) argued that employees with higher mental health are more able to seek and protect their resources, becoming more creative, resilient, engaged, and productive.

In short, cognitive (self-regulatory), affective (mental health), and motivational (vitality) resources seem to play a very important, albeit differentiated, role in the impact of sleep quality on managers' performance. Daily sleep quality has a positive relationship with performance (contextual and task) through self-regulatory resources. Additionally, subjective vitality and mental health influence this indirect relationship. That is, when self-regulatory resources are not restored by the night's sleep, managers need their physical and mental health conditions to manage their effort and behaviour

regarding their task and contextual performance; however, as self-regulatory resources increase, they develop strategies to protect their health, as a way to preserve resources, as regulatory ones seem to be sufficient to achieve higher levels of task and contextual performance.

Limitations and future directions

The limitations of the study are related to sample issues since it is small (N= 97) and mostly male (85.4%), which limits the generalization of the results. A larger size of participants could benefit this study. Moreover, we only included managers in this sample, hence the generalizability of the findings has to be made with caution.

Another limitation of this study is the fact that it was carried out during the pandemic period when people are in different psychological conditions than the normal period, which can bias, at some point, the study findings. Hence, future studies should deepen knowledge about fluctuations in daily sleep quality and the role of daily regulatory, affective, and motivational resources for daily performance in less turbulent periods to verify whether the effects remain.

Plus, data was collected through self-reported measures which may lead to common method bias. At last, although we used a daily diary study, we collected data only once per day, which may have somehow biased the results. Thus, future studies should use more complex daily designs, for instance resorting to a daily diary study, with at least two data collections per day.

Given the importance of sleep quality in replenishing self-regulatory resources for employee effectiveness, having slept poorly can be highly detrimental to performance (e.g., Litwiller et al., 2017). In this perspective, the continuity of the investigation is fundamental. Future research could investigate sleep deprivation factors and their consequences on performance. For instance, analysing the impact of working

hours on sleep quantity and quality for performance or exploring the impact of modern technology on sleep quality and how it affects adaptive performance could be a line of investigation to follow.

Practical implications

The results may be useful for managers who can benefit from the following recommendations. For example, developing an intervention to improve day-to-day sleep quality at home can facilitate employee performance on a daily basis. Managers should consider implementing programs in organizations that help them and their employees value healthy sleep habits (for example, through training programs focused on education about the importance of sleep for well-being), since the results of this study show that a good night's sleep allows employees to replenish their self-regulatory resources and, consequently, facilitate their productivity (Pilcher et al., 1997).

Another suggestion may be interventions focused on mindfulness-oriented meditation accompanied by mindfulness exercises. This can contribute to improving sleep quality and restoring self-regulatory resources that facilitate performance (Hulsheger, 2015).

In addition, organisations can develop actions that highlight the importance of self-regulatory resources. For example, organizations can alert their managers to the importance of quality sleep and the resultant restored self-regulatory resources. It will be relevant to be aware of the situations in which poor sleep quality occurred. In these situations, it will be important for the worker to have the autonomy needed to develop recovery strategies throughout the day, for example, engaging in micro-breaks (head petting the dog (Junça-Silva, 2022), as these help with recovery of self-regulatory resources (Kim et al., 2022). Similarly, watching videos, images or humorous texts can

alleviate the negative consequences linked to poor sleep quality and have restorative effects on employees (Ferrer et al., 2015).

Furthermore, considering the crucial role of regulatory resources in linking sleep quality to performance, this study highlights that maintaining and conserving these resources help to stabilize employees' effectiveness at work (Sieber et al., 2019). Thus, grant autonomy (to decide, for example, the order of tasks to be carried out), promote more flexible hours (where the manager can choose the working hours - for example, on days when the night was not so refreshing, start working later, or choose the period of the day when you can be more productive), or finally, implement telework, albeit in a hybrid format, because on those days when sleep does not allow you to restore energy and regulatory resources, avoid spending time in traffic or the stress of travel itself can be an added value for managers.

Conclusion

The quality of daily sleep facilitates greater task and contextual performance by increasing their motivation to invest self-regulatory resources at work. However, this relationship is moderated by physical (vitality) and mental (mental health) health conditions. These seem to be particularly relevant when the individual cannot recover their regulatory resources, creating conditions to facilitate the task and contextual performance.

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Tables

Table 1

Means, Standard deviations, ICC, and Between-and Within-Person Level Correlations

Variables	*M*	*SD*	ICC	1	2	3	4	5	6
1. Sleep quality	3.53	1.57	0.39	-	.91**	.14**	.09	.90**	.89**
2. Regulatory resources	2.19	1.37	0.58	.55**	-	.12*	.06	.87**	.85**
3. Task performance	4.76	.52	0.62	.21*	.18*	-	.80**	.13*	.14*
4. Contextual performance	4.83	.42	0.59	.23*	.16	.54**	-	.10*	.08
5. Vitality	3.32	1.02	0.72	.17*	.18*	.22*	.10	-	.93**
6. Mental health	3.28	.99	0.64	.38**	.23*	.18*	.08	.83**	-

Note. Correlations below the diagonal are between-person levels. Correlations above the diagonal are within-person level. ICC = intraclass correlation. $N_{(observations)} = 485$; $n_{(participants)} = 97$.

***$p < .001$, ** $p < .01$, *$p < .05$.

Figures

Figure 1

The conceptual moderated mediation model
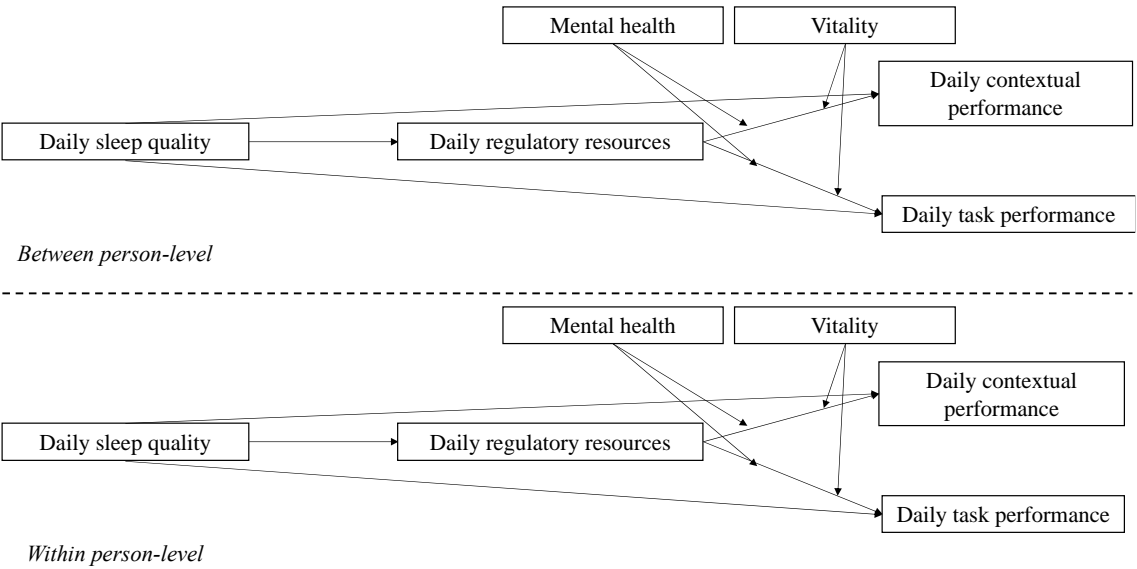
Between person-level

Within person-level

Figure 2

The moderating role of vitality on the relationship between self-regulatory resources

and (task and contextual) performance

Figure 3

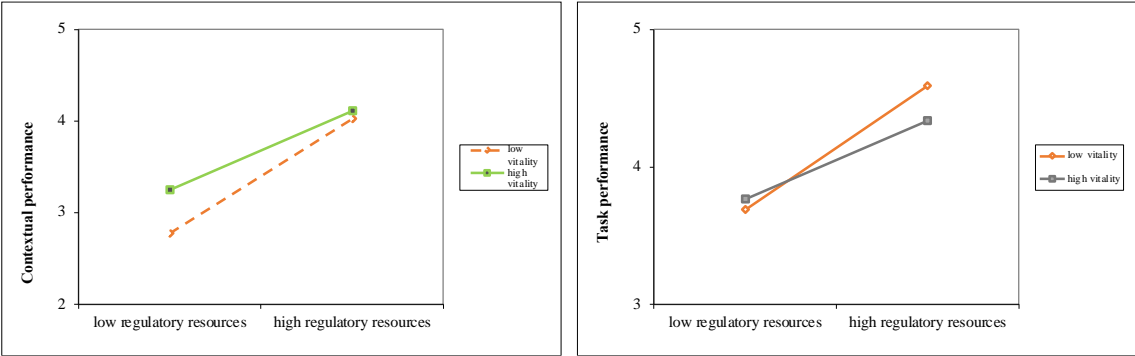*The moderating role of mental health on the relationship between self-regulatory*

resources and (task and contextual) performance