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## MEDIATING EFFECT OF BURNOUT DIMENSIONS ON MUSCULOSKELETAL PAIN: THE ROLE OF EMOTIONAL INTELLIGENCE AND ORGANISATIONAL IDENTIFICATION

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### ABSTRACT

Aim/Purpose	The present study aims to frame the relationship between job and personal resources (namely, organizational identification and emotional intelligence), burnout, and musculoskeletal disorders (i.e., back pain, upper limb pain, lower limb discomfort), into the theoretical framework provided by the JD-R health model.
Background	Empirical research indicates a connection between burnout and the onset of musculoskeletal problems, one of the most important occupational health issues affecting all jobs and organizations. In light of the JD-R health model, we investigated the association between personal and job resources with burnout and musculoskeletal disorders.
Methodology	An anonymous online questionnaire was answered by 320 workers (82.4% female, $M_{age} = 42.18$ ; $SD_{age} = 12.24$ ) investigating their perceived level of burnout, the presence of musculoskeletal pain (back, neck, and shoulder), and their level of organizational identification and emotional intelligence. Descriptive analysis, correlation, and moderated mediation model were performed using SPSS.

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Contribution	We confirmed the role of personal and organizational resources in the salutogenic process considered by the JD-R health model. Emotional intelligence, decreasing the perceived level of burnout, limited the development of musculoskeletal disorders. Moreover, when organizational identification presented low and medium levels, the association between emotional intelligence and burnout strengthened.
Findings	Our results showed a negative, indirect effect of emotional intelligence on musculoskeletal disorders via burnout. Moreover, we found a moderation of organizational organization, indicating that at low and medium levels of identification, the association between emotional intelligence and burnout is stronger.
Recommendations for Practitioners	Results give practical advice regarding the content of stress management and well-being promotion content, suggesting the importance of considering emotional intelligence-specific training and information regarding organizational identification.
Recommendations for Researchers	In addition to work factors involved in the link between burnout and musculoskeletal disorders, it is also important to consider personal and emotional factors, which can decrease the occurrence of adverse consequences.
Impact on Society	The study focuses on musculoskeletal problems, which are a significant occupational health issue. The study contributes to a better understanding of how work variables affect physical health by finding the link between burnout and these diseases. This understanding can lead to better workplace design and procedures to prevent such health problems. In summary, the study given in this abstract has the potential to positively affect society by boosting worker well-being, addressing occupational health problems, improving training and skill development, and advancing research in the field. These consequences underline the need to take into account both personal and professional resources when designing healthier and more productive environments.
Future Research	Future research developments could contribute to a deeper understanding of the mechanisms linking emotional intelligence, burnout, and musculoskeletal problems, as well as consider objective indicators of burnout levels or consider using ecological data collection methodologies (e.g., ecological momentary assessment), to identify patterns and associations between burnout and musculoskeletal disorders.
Keywords	musculoskeletal disorders, burnout, emotional intelligence, organizational identification, JD-R model, salutogenic process

## INTRODUCTION

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Over the last 20 years, one of the significant theoretical frameworks explaining the nomological network of burnout is the Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2007, 2017; Demerouti et al., 2001). JD-R is based on two main assumptions. The first assumption is that job characteristics, peculiar to each context, can be nested into the overarching categories of job demands and job resources. The second assumption postulates that these characteristics trigger two parallel and opposite processes, called the energetic process, which links high levels of job demands to the occurrence of burnout symptoms, and the motivational process, which connects the availability of job and personal resources to work engagement (Demerouti et al., 2001). Subsequent developments further explored how job and personal resources may buffer the energetic process development, thus acting as a protective factor against the onset of burnout (Bakker & Demerouti, 2007, 2017; Demerouti et al., 2001).

Emotional intelligence and organizational identification are often included among the job and personal resources that could influence and limit the onset of burnout symptoms. For example, emotional intelligence (EI) is known as the capacity to recognize, comprehend, and successfully control emotional processes (Levitats et al., 2022; Salovey & Mayer, 1990; Zeidner et al., 2008). It gives the person the psychological tools required to behave wisely and express the appropriate emotions in various situations. According to the JD-R model, emotional intelligence is a motivating component in an organizational context that can have numerous beneficial results (Bakker & Demerouti, 2007; Bakker et al., 2004). According to several studies (Lopes et al., 2006; Sy et al., 2006), emotional intelligence tends to increase employee well-being indicators like job satisfaction and discretionary work behaviors. Moreover, emotional intelligence has been linked to a softening effect on workplace tensions, such as emotional weariness (Görgens-Ekermans & Brand, 2012; Karim & Weisz, 2011; Shkoler & Tziner, 2017). As a result, individuals can control their emotions when they experience annoyance, grief, or anything subtle (such as feeling angry, joyful, or frightened). Also, those who have elevated levels of EI are extremely sensitive to the emotions of others. One can become a better employee by having the capacity to be perceptive to emotional cues coming from both within and from the social environment. EI is positively correlated with happiness and job performance, according to research (for a meta-analysis, see Martins et al., 2010; O'Boyle et al., 2011). Being able to detect and control one's emotions is especially crucial in emotionally taxing job environments, such as those where staff must deal with obstinate patients, pupils, or clients. Those with high EI are also able to notice their own stress and weariness at work and control it as a result.

EI is identified as a mediator because, as an individual resource, it is able to prevent symptoms of burnout (Salami & Ajitoni, 2016). Previous studies have emphasized the benefits of EI for reducing occupational stress, lowering levels of negative emotions, and experiencing favorable emotional states (Keefer et al., 2009; Zeidner et al., 2012). Previous research, using the JD-R model as a framework, has revealed that while burnout is primarily defined by emotional tiredness, a stronger capacity to control one's own negative emotions (i.e., EI) may help to avoid the onset of burnout (e.g., Tesi, 2021).

Regarding organizational identification, interest in social identity processes of stress and health has been increasing recently (Avanzi et al., 2015; Paganin, Avanzi, et al., 2023). Organizational identification has the ability to influence people's perceptions of stress (Valencia & de Gracia, 2022). Indeed, numerous studies have demonstrated a negative relationship between stress and burnout and a person's affiliation identification with a social group, such as their organization or work team (e.g., Bizumic et al., 2009; Haslam et al., 2005). Specifically, organizational identification is defined as the feeling of belonging or membership in some human group (Ashforth & Mael, 1989, p. 21). According to the social identity theory, social groups like organizations, schools, or work teams are not only aspects of the outside world, but they are also, instead, internalized by the person and help them feel more like themselves (Haslam, 2004). Consistently, as considered by the social identity concept of stress (Haslam, 2004), a strong sense of group belonging could be a potent defence against burnout, as supported by several data (Avanzi et al., 2014; Bizumic et al., 2009; Jetten et al., 2012; Steffens et al., 2017).

More recently, a noteworthy revision of the JD-R model resulted in the development of the JD-R health model (Brauchli et al., 2015), assuming both negative and positive biopsychosocial health indicators as the main outcomes of the energetic and motivational processes. Specifically, the JD-R health model was associated with job demands that could lead to health impairment due to a pathogenic process, whereas the job resources were linked to a salutogenic process. Moreover, considering that people recover from demands more readily when greater pools of resources are available, we can assume that job resources may prevent poor health symptoms.

Nevertheless, more studies are needed to uncover the influence of personal resources in the revised model (Brauchli et al., 2015). Accordingly, the current study aims to investigate the role of individual resources, both at professional and personal levels (i.e., organizational identification, and emotional

intelligence), within the salutogenic process. An increasing body of research has revealed a dynamic interplay between the structural and psychosocial factors in influencing workers' experience. It is believed that both physical pain and burnout are responses to perceived workplace pressures (Langballe et al., 2009). Accordingly, conditions of sustained psychological stress may cause muscle tension, which could reduce muscular strength and mobility (Soares & Jablonska, 2004). Even if burnout is often accompanied by somatic symptoms (such as muscular discomfort), research on the connection between burnout and physical health is far from being exhaustive (Schaufeli et al., 2020).

To augment and consolidate the body of research, the present study aims to frame the relationship between job and personal resources (namely organizational identification and emotional intelligence), burnout, and musculoskeletal disorders, into the theoretical framework provided by the JD-R health model. In this regard, we hypothesize the following:

H1a: Emotional intelligence (personal resource, the capacity to recognize, comprehend, and successfully control emotional processes) is directly and negatively associated with musculoskeletal disorders and burnout.

H1b: Burnout is directly and positively associated with musculoskeletal disorders.

H1c: Emotional intelligence is indirectly and negatively associated with musculoskeletal disorders, via burnout.

H2a: Organizational identification (job resources, the feeling of belonging or membership in some human group) will moderate the association between emotional intelligence and burnout; specifically, we hypothesize that the association between emotional intelligence and burnout will be stronger at a high level of organizational identification.

H2b: Organizational identification will moderate the indirect path between emotional intelligence and musculoskeletal disorders via burnout.

The hypothesized model is shown in Figure 1.

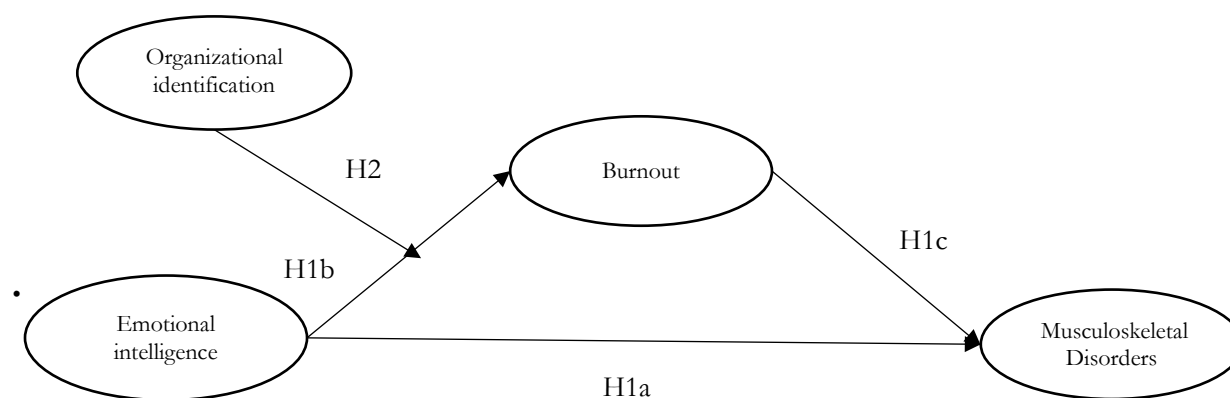


Figure 1. Hypothesized model

## METHODS

### STUDY SUBJECTS

Participants were reached using the snowball sampling technique. Snowball sampling is an approach to participant recruitment where currently enrolled research participants are invited to assist researchers in the identification and recruitment of additional research subjects. Participants were invited to complete an online anonymous questionnaire implemented in Qualtrics, an online platform used in

academia and business for the purpose of structuring, managing, and collecting data. Participants received an email instructing them to answer the questionnaire by clicking on an anonymous link. In accordance with the standards for handling personal data outlined in the Italian Data Protection Act (Legislative Decree DL-196/2003), a cover letter explaining the scope and objectives of the study and emphasizing the participants' privacy and anonymity was attached to the first page of the questionnaire. As a result, it was considered that by completing the survey, individuals had provided their approval. The study did not require ethical approval based on relevant institutional and national criteria because it adhered to the most recent Declaration of Helsinki (World Health Organization, 2019), which establishes ethical principles for research. There was no need for extra ethical approval because there was no therapy, including medically invasive tests or procedures that caused psychological or social pain to participants. In addition, it was noted in the letter that individuals could stop taking part at any time and without giving a reason and that employers would not be made aware of their choice. As a result, the completion of the survey assumed the participants' informed permission.

## ***MEASURES***

All dimensions were investigated using scales validated in the national or international literature. We assessed burnout using the Burnout Assessment Tool, including 12 items (the BAT-12 brief version) (Hadžibajramović et al., 2022; Mazzetti et al., 2022). A selection of components from the already validated Italian BAT-23 scale composed this scale. Three specific questions were used to assess each of the four main burnout symptoms: exhaustion (example: "At work, I feel mentally exhausted"), mental distance (example: "I struggle to find any enthusiasm for my work"), cognitive impairment (example: "At work, I have trouble staying focused"), and emotional impairment (example: "At work, I feel unable to control my emotions"). On a 5-point Likert scale with 1 (never) to 5 (often), participants were asked to respond to questions indicating the frequency of these symptoms. In the current study, all the dimensions showed acceptable levels of internal consistency (Cronbach's alpha ranging from 0.66 to 0.78).

Emotional intelligence was evaluated using the Brief Emotional Intelligence Scale (BEIS-10) (Davies et al., 2010), a 10-item self-report instrument. Participants report their level of agreement to each statement using a 5-point Likert-type scale from 1 (strongly disagree), to 5 (strongly agree). An overall index of emotional intelligence can be created using responses to the 10 items, as well as estimates for five distinct aspects of emotional intelligence, including an evaluation of one's own emotions (for example, "I know why my emotions change"), an evaluation of others' emotions ("I can tell how people are feeling by listening to the tone of their voice"), the regulation of one's own emotions (for example, "seek out activities that make me happy"), the regulation of others' emotions (for example, "I arrange events others enjoy"), and the use of emotions (for example, "when I am in a positive mood, I am able to come up with new ideas"). In the current evaluation, BEIS was found to have acceptable levels of internal consistency (Cronbach's alpha = 0.77).

Organizational identification was assessed using a 6-item scale validated in Italian by Manuti and Bosco (2012). Example items are "The achievements of the school I work for are my achievements" and "I am very interested in what others think about the organization I work for". The scale showed good reliability (Cronbach's alpha = 0.80).

Musculoskeletal disorders were assessed using three items selected from the 8-item scale by Avallone and Paplomatas (2005). Participants were asked whether they had suffered from back pain, upper limb pain, or lower limb discomfort in the past six months, using a 3-point scale (0 = no; 1 = I don't remember; 2 = yes). The dimension showed a good internal consistency (Cronbach's alpha = 0.70).

Along with the reported measure, we asked the participants to indicate some socio-demographic information, such as their gender, age, and work seniority. We decided to include them as control variables, as the literature emphasizes them as factors implicated in the occurrence of these disorders (Weale et al., 2022; Yasobant & Rajkumar, 2015).

### STATISTICAL ANALYSIS

SPSS was used to examine the data (Version 28, SPSS Inc. Chicago IL). The normality, kurtosis, and skewness indices of the variables under consideration were first examined. The averages, standard deviations (SD), Cronbach’s alpha, and bivariate correlation coefficients were calculated to further assess the relationship between all variables used in this study. Using Cohen’s parameters, we were able to determine the magnitude effects of “little” (0.10), “mid” (0.30), and “high” (0.50) correlation effects (Cohen, 2013). The PROCESS macro was used to evaluate the proposed models: the basic mediation model, and the further moderated mediation model (model 4 and model 7). The advantage of PROCESS is exploring the moderated mediation model by examining the direct and indirect effects of the proposed model while analyzing all path coefficients. We first used a mediation model to examine how organizational identification and musculoskeletal illnesses are mediated by BAT scores.

The subsequent moderated mediation model additionally investigated whether emotional intelligence affected the mediated relationship between organizational identity and BAT score. The moderated mediation model’s base is two linear regression analyses. In the first regression analysis, the mediator (BAT) is predicted by the independent variable (EMO INT), the moderator (ID ORG), and the interaction between the independent and moderating variables (EMO INT X ID). The dependent variable is predicted by the independent variable, the moderator, their interaction, and the first mediator in the second regression analysis (MUSK DIST).

Straightforward slope analyses were employed to examine the relationships between the independent and moderator variables (Sinacore, 1993). Notably, the conditional impacts were looked at for emotional intelligence scores that were low (1 SD below the mean), medium (mean), and high (1 SD above the mean). The indirect and moderating effects, including 95% bias-corrected confidence intervals (CIs), using 5,000 bootstrap samples, were calculated (Hayes, 2017).

## RESULTS

### DESCRIPTIVE ANALYSIS

A total of 320 workers answered the questionnaire, of which 82.4% were composed of female workers. The mean age was 42.18 (SD = 12.24). Of the sample, 45.7% obtained a High School Diploma, 36.1% obtained a degree, and 12.9% a master’s degree or PhD. The remaining 5.3% reported that they had completed elementary school. Finally, 58.4% of participants were employed in the private, public, or commercial sector and 59.9% had a permanent full-time contract.

Table 1 shows intercorrelations for key variables. All the significant correlations were in the expected direction. For example, it is possible to notice a negative correlation between burnout and organizational identification and a positive correlation between musculoskeletal disorders and burnout. Moreover, organizational identification and emotional identification seem to be positively correlated. Additionally, all scales showed an internal consistency (Cronbach alpha’s) above the minimum acceptable threshold of 0.70 (DeVellis & Thorpe, 2016), as reported along the diagonal of the table.

**Table 1. Cronbach’s alphas, and correlations**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>1. Gender</b>	--									
<b>2. Age</b>	-0.03	--								
<b>3. Education</b>	-0.02	-0.32**	--							
<b>4. Work Role</b>	0.02	0.09	0.36**	--						
<b>5. Contract</b>	-0.06	-0.08	0.05	0.12*	--					

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>6. Seniority</b>	-0.02	0.69**	-0.29**	0.00	-0.05	--				
<b>7. Organizational Identification</b>	-0.01	0.21**	-0.06	0.19**	0.04	0.16**	<b>(0.80)</b>			
<b>8. Burnout</b>	-0.06	-0.08	0.03	-0.07	-0.16**	-0.03	-0.21**	<b>(0.84)</b>		
<b>9. Musculoskeletal Disorders</b>	-0.19**	0.02	-0.04	-0.11*	-0.04	-0.06	-0.09	0.27**	<b>(0.70)</b>	
<b>10. Emotional Intelligence</b>	-0.05	0.09	0.13*	0.18**	0.01	0.01	0.33**	-0.37**	-0.10	<b>(0.77)</b>

Note: Cronbach's on the diagonal, in bold. \*\*  $p < 0.01$ ; \*  $p < 0.05$ . Sex: female = 0, male = 1.

### MEDIATION AND MODERATION EFFECTS

Model 4 and Model 7 from the PROCESS macro were used, respectively, to evaluate the hypothesized mediation and moderated mediation models. Hence, we first investigated whether burnout played a mediation role in the relationship between organizational identity and musculoskeletal diseases.

As control variables, the model included age, gender, and work seniority. We did not find a significant direct association except for gender, which reported a significant negative association with musculoskeletal disorders [b(SE) = -0.29 (0.09),  $p = 0.003$ , 95% CIs (-0.47; -0.10)]. Furthermore, our results indicated that emotional intelligence (H1a) was not directly associated with musculoskeletal disorders [b(SE) = -0.07 (0.10),  $p = 0.466$ , 95% CIs (-0.26; 0.12)]. Nevertheless, emotional intelligence (H1b) was directly and negatively associated with burnout [b(SE) = -0.45 (0.07),  $p = 0.000$ , 95% CIs (-0.58; -0.31)]. Moreover, the current results indicated a significant positive direct relationship between burnout (H1c) and musculoskeletal disorders [b(SE) = 0.33 (0.07),  $p = 0.000$ , 95% CIs (0.19; 0.47)].

The predicted indirect effect found empirical support (H1d) [b(SE) = -0.15 (0.04), 95% CIs (-0.23; -0.07)]. The standardized regression coefficients, standard errors (SE), and summary findings of the proposed mediation model are presented in Table 2.

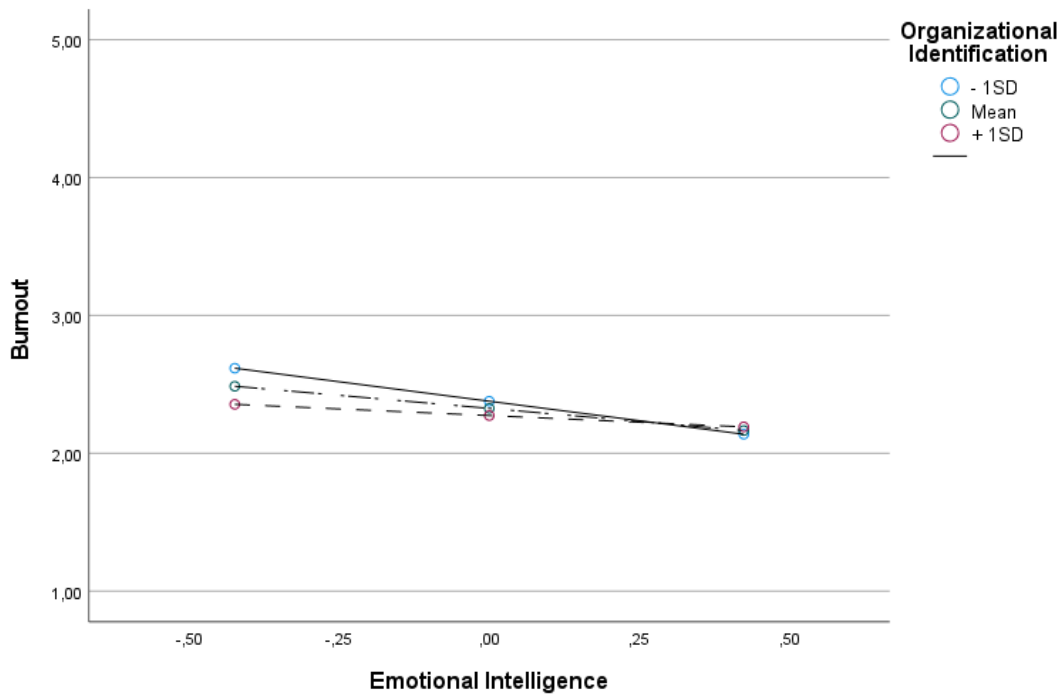
**Table 2. The mediation effect of burnout between emotional intelligence and musculoskeletal disorders**

Indirect Effect	Est. (SE)	95%CI
Emotional intelligence → Burnout → Musculoskeletal Disorders	-0.15 (0.04)	(-0.23, -0.07)

The second model hypothesized in the current research was tested using model 7 as proposed by Hayes (2017), in which burnout has a moderating role in the indirect link between organizational identity and musculoskeletal illnesses. Particularly, we hypothesized that organizational identification moderated the association between emotional intelligence (i.e., the independent variable) and burnout (i.e., the mediator). As shown in Table 3, emotional intelligence reported a significant main effect on burnout (H2a) [b(SE) = -0.38 (0.07),  $p = 0.000$ , 95% CIs (-0.52; -0.24)] and organizational identification mitigated this effect [b(se) = 0.25 (.09),  $p = 0.005$ , CIs (0.08; 0.42)]. Figure 2 illustrates how a low and medium perception of organizational identity is associated with a stronger association between emotional intelligence and burnout. Hence, Hypothesis H2a was not supported. The moderated mediation effect was found [b(se) = 0.10 (0.04), CIs 0(0.01; 0.16)]. Therefore, we provided empirical support to the hypothesis H2b.

**Table 3. Testing the moderated mediation effect of the organizational identification on emotional intelligence on burnout**

Variables	Est. (SE)	t
Gender	<b>-15*</b> (0.07)	-2.10
Age	-0.01 (0.01)	-0.82
Seniority	0.01 (0.01)	-0.93
Emotional intelligence	<b>-0.38***</b> (0.04)	-5.21
Organizational identification	-0.07 (0.04)	-1.69
Emotional intelligence X Organizational identification	<b>0.25**</b> (0.08)	2.85
R <sup>2</sup>	0.02	
F	8.10	



**Figure 2. Interaction effect between emotional intelligence and organizational identification on burnout score**

## DISCUSSION

The present study sought to fill the gap in the literature regarding the link between job and personal resources, psychosocial risk factors, and musculoskeletal disorders, using the theoretical background of the JD-R health model.

Regarding the direct and negative association between emotional intelligence and musculoskeletal disorders (H1a), we cannot confirm our hypothesis. The result was not in line with the previous studies. For instance, a study by Ekechukwu et al. (2020) revealed a strong and negative association between



emotional intelligence and low back and shoulder pain. Because they employed processes that support their ability to adjust to environmental changes, people with higher levels of emotional intelligence may be less vulnerable to developing MSD in specific body regions, according to this connection. The lack of a direct relationship between emotional intelligence and musculoskeletal disorders can be attributed to several factors. First, it is possible that there are factors that play a more important role in the occurrence of musculoskeletal disorders. The complexity of the relationship between psychological constructs, such as emotional intelligence and musculoskeletal disorders, may also contribute to the lack of a clear association. The multifaceted nature of emotional intelligence may lead to different effects on physical health, whereas our results confirm the direct and negative association between emotional intelligence and burnout (H1b). The association between personal resources and burnout was previously confirmed by several studies (Görgens-Ekermans & Brand, 2012; Lee & Ok, 2012; Mazzetti et al., 2019; Sanchez-Gomez & Bresó, 2020), indicating that effectively controlling one's own and other people's positive and negative emotions may be a protective factor that lowers a person's vulnerability to burnout. According to Francis et al. (2011) and Ramón (2015), affectivity plays a big role in coping with burnout. For instance, in a study by Gloria et al. (2013), instructors who exhibit more positive and less negative affect in the classroom are more likely to cope with stress successfully. Moreover, Petitta et al. (2017), suggest that increased positive affect and decreased negative affect may be the mechanism through which EI improves emotional depletion core characteristics of burnout. The motivation is to be attributed to the fact that emotional intelligence gives the person the psychological tools required to behave wisely and express the appropriate emotions in various working situations (Levitats et al., 2022; Salovey & Mayer, 1990; Zeidner et al., 2008).

Concerning the association between burnout and musculoskeletal disorders (H1c), our results confirm it, in line with past studies (e.g., Amaral & Santos, 2019). Indeed, several studies indicated that burnout symptoms are often associated with negative health outcomes, including physical ones (Honkonen et al., 2006; Lee & Ok, 2012). Indeed, it is conceivable to assume that persistent psychological stress may result in muscle tension, which would lower physical strength and mobility (Langballe et al., 2009).

We confirmed the indirect effect of emotional intelligence on musculoskeletal disorders, via burnout (H1d). While the role of job resources in decreasing the detrimental effect of burnout on negative health outcomes had already been ascertained, the role of personal resources in the integrated JD-R health model was still little explored (Brauchli et al., 2015). Our results allow us for a more in-depth understanding of the role of personal resources in the salutogenic process of the JD-R health model. As previously stated, workers with good levels of emotional intelligence find themselves facilitated in expressing and understanding their own and others' emotions. This ability allows them to limit the onset and severity of burnout-related symptoms, including physical tension, thus consequently, limiting the occurrence of musculoskeletal disorders.

Finally, we found a moderate effect of organizational identification in the association between emotional intelligence and burnout (H2a). However, the moderation did not follow the foreseen direction.

Following this result, which is not in line with the results in the literature, we tried to give an interpretation. Referring to job resources, interest in social identity processes of stress and health has been increasing (Avanzi et al., 2015). Organizational identification is among the most widely used work resources to explain work and personal outcomes of workers, including well-being and health (Avanzi et al., 2021; Ng & Allen, 2018). However, little existing literature exists on this topic (Avanzi et al., 2021). Numerous studies have demonstrated a negative relationship between stress and burnout and a person's affiliation with a social group, such as their organization or work team (e.g., Bizumic et al., 2009). Specifically, organizational identification is defined as the feeling of belonging or membership in some human group (Ashforth & Mael, 1989). According to social identity theory, social groups

like organizations, schools, or work teams are not only aspects of the outside world, they are internalized by the person and help them feel more like themselves (Haslam, 2004). Consistently, as considered by the social identity concept of stress (Haslam, 2004), a strong sense of group belonging could be a potent defense against burnout, as supported by several data (Avanzi et al., 2014; Bizumic et al., 2009). Although no similar studies in the literature consider the moderation of organizational identification in the association between emotional intelligence and burnout, we could expect the effect of this job resource would strengthen the personal resource's effect on burnout. Instead, our results showed a different trend. Indeed, the effect of emotional intelligence on job burnout appears to be stronger at low and medium levels of organizational identification. This might indicate how the effect of emotional intelligence turns out to be more relevant when workers do not perceive identification with their organization. Thus, when the sense of belonging with one's organization turns out to be low or medium, the ability to express and understand one's own and other's emotions is crucial in decreasing the risk of burnout.

Our study has several strengths. We confirmed the moderated mediation of organizational identification in the indirect effect of emotional intelligence on musculoskeletal disorders, via burnout. In particular, we confirmed the indirect effect in the presence of low and medium levels of organizational identification. Once again, we can identify that when workers do not perceive a sense of belonging with their organization, the presence of a personal resource such as emotional intelligence, which enables them to express and understand their own and others' emotions, enables them to decrease the symptoms of burnout, and consequently lighten the effect of the accumulated tension that could lead to the development of musculoskeletal disorders. Therefore, in light of the theoretical framework of the JD-R health model, we investigated the role of personal resources in the model. Our results show how, in the absence of job resources such as organizational identification, a personal resource, such as emotional intelligence, could activate that healthy process capable of decreasing the impact of the psychosocial risk of burnout, limiting as a result the experience of adverse health conditions, such as musculoskeletal disorders.

### ***LIMITATIONS AND FUTURE DIRECTIONS***

This study also has some limitations. First, it is a cross-sectional study, which does not allow us to identify causal relationships among variables. A second limitation is that the sample size does not allow for generalization of the results. Furthermore, because there is clear evidence that psychosocial risk factors combine with (and often exacerbate) physical risk factors in the development of musculoskeletal disorders (Graveling et al., 2021), future studies should also consider the possible contribution of biomechanical risk factors to the occurrence of musculoskeletal pain. Future studies could benefit from other instruments that provide objective data on musculoskeletal disorders or daily burnout data collection (Jordan & Troth, 2020). To overcome these limitations, future studies could plan to collect data at multiple time points to observe fluctuations in the extent of burnout and musculoskeletal disorders and the impact of emotional intelligence and organizational identification on them. In addition, consideration could be given to expanding data collection to a larger number of participants by selecting industries representative of major occupational categories.

### ***PRACTICAL IMPLICATIONS***

Limitations aside, the present study has practical implications useful for improving the health status of workers. Most studies usually focus on risk factors that lead to the deterioration of workers' health. In contrast, the present study focuses on variables and resources that could help limit the occurrence of psychophysical problems such as burnout and musculoskeletal disorders. The results showed a direct relationship between emotional intelligence and burnout and an indirect relationship with musculoskeletal disorders. This may provide guidance to organizations and professionals on the content of training. Recent research has shown that it is possible to provide interventions that are cheaper, easier to use, and disseminated through new technologies (de Korte et al., 2018; Paganin &

Simbula, 2020, 2021). Therefore, one could consider developing applications that provide guidance on how to improve one's emotional intelligence and show its effect in reducing burnout and musculoskeletal disorders, such as back, neck, and shoulder pain. In addition, it might be useful to change the company's approach to the concept of mental and physical health, promoting a mental-health-oriented leadership style, in order to ensure a safe environment in which it is easy to talk about one's health, both physical and mental, and in which there are positive role models to take as an example (Paganin, De Angelis, et al., 2023).

In addition, we have shown that the role of the personal resource considered (emotional intelligence) becomes stronger at low and medium levels of identification with the organization. However, this suggests to us that identification with one's organization can be helpful in reducing the perceived level of burnout.

## CONCLUSIONS

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Because of the significant socioeconomic and technological developments that have led to new types of employment and work circumstances, as well as new occupational health problems, psychosocial risk factors have attracted the interest of occupational safety and health researchers, policymakers, and practitioners. Managing psychosocial risk factors is one of the most challenging tasks in occupational safety and health because of their potential impact on workers' work-related stress and well-being all over the world. Burnout has received much attention, mainly because of its negative impact on psychophysical health, including musculoskeletal disorders (e.g., Fraboni et al., 2023). Several theoretical models attempt to capture the causes of burnout and mental and physical health disorders. One of them is the JD-R model, which has undergone several modifications and additions over the years. One of the further developments of the model is the JD-R health model, which considers the processes of interaction between work and personal demands and resources from a pathogenic or salutogenic perspective.

Considering this theoretical model, the present study showed that emotional intelligence, a personal resource not yet considered in the JD-R health model, has an indirect negative effect on MSDs mediated by burnout. In addition, the current study showed that emotional intelligence plays a stronger role when identification with the organization is rated as low or medium.

Thus, the present study underscores the importance of acting on the development of personal resources, as these help to reduce the risk of burnout and thus limit the occurrence of physical health disorders such as musculoskeletal disorders. Finally, as for others (Fraboni et al., 2023; Giusino et al., 2023), our wish is that our work can contribute to the enhancement of empirical knowledge that can inform a wider public beyond disciplinary limits (Tommasi, 2023)

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