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Workplace Bullying as a Risk Factor for and Musculoskeletal Disorders: The Mediating Role of
Job-Related Psychological Strain

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Author Note

Comment [A1]: I altered the title to fit the APA style 12-word limit.

I have checked the paper to ensure that it meets the requirements of the *Journal of Applied Psychology*. I consulted some sample papers to ensure that the style of writing is aligned with the journal's preferences.

While the language in the paper was good, several other aspects related to length and focus need to be addressed. I have provided detailed recommendations in the Scientific Editing Report.

Comment [A2]: Please provide the necessary details here.

Comment [A3]: The Author Note should contain 4 paragraphs.

1. First: Complete departmental affiliation. Provide the departmental affiliation for each author in the author note.
2. Second: Changes of affiliation, if any
3. Third: Acknowledgements and special circumstances. Disclose special circumstances about the article (portions presented at a meeting, student paper as basis for the article, report of a longitudinal study, relationship that may be perceived as a conflict of interest).
4. Fourth: Person to contact

Abstract

Comment [A4]: The Abstract meets the journal's stipulated word count.

According to the European Agency for Safety and Health at Work, workplace bullying is one of the emerging psychosocial risk factors that could negatively affect a worker's health. The aim of Studies have explored the impact of bullying on psychological health, but not many have investigated its impact on other health aspects. This study was to analyze the process that leads from how bullying to leads to negative physical health disorders, (such as musculoskeletal disorders (MSDs)), by testing the mediating role of job-related strain. Data were collected on from 512 workers-employees (62.9% female; mean age = 43.6 years) of a retail chain who filled in completed a self-report questionnaire after a one-hour training session on work-related stress. Data analyses were performed controlling-adjusting for potentially confounding variables (i.e., gender, age, organizational role, type of contract, and perceived physical job demands). The analytical approach of Preacher and Hayes analytical approach was used to test the indirect relationship between bullying and MSDs. Results showed that work-related strain mediates mediated the relationship between bullying and the MSDs considered (low back, upper back, and neck) except for MSDs of the shoulders. Workplace bullying is considered by the European Agency for Safety and Health at Work one of the emerging psychosocial risk factors that could negatively affect workers' health. Our study confirms the role played by of bullying and job-related strain in determining workers' MSDs.

Comment [A5]: I have moved this text here to set context before we start discussing the study. I have also added a line on how this study

Keywords:

Comment [A6]: I would recommend that instead of restating the results in this sentence, you add some information about the implications or future directions that your findings have—for example, who will benefit from these findings and why are they important.

Comment [A7]: Please insert suitable keywords here.

Workplace Bullying as a Risk Factor for Musculoskeletal Disorders: The Mediating Role of Job-Related Psychological Strain

1. Introduction

Increasing attention has been paid in the past 15 to 20 years to the phenomenon of workplace bullying; in some countries, it is also called “mobbing” [1]. Workplace bullying refers to a series of negative behaviors carried out frequently and over a prolonged period of time, usually against an individual employee by his or her colleagues or superior [2]. ~~Some of the~~ Examples of these negative behaviors are as follows: ~~e.g.,~~ excessive criticism of one’s work; withholding of information, which affects performance; being assigned an unmanageable workload; spreading ~~of~~ rumors; and social isolation.

Bullying is an escalating process in the course of which the person confronted adopts ~~ends up in~~ an inferior position and becomes the target of systematic negative social acts.

Therefore, a conflict cannot be called bullying if the incident is an isolated event or if it involves two parties of approximately equal powerstrength [2]. The consequences of exposure to bullying may be traumatic for the affected individual [3, 4]. Determining the Prevalence-prevalence estimates of bullying ~~are is~~ difficult due to ~~a the~~ lack of an ~~agreed-upon~~ consensus definition of the phenomenon. A recent European survey [5] estimated a prevalence of 4% among European workers. However, in the same survey, 11% of workers reported they were the subject of verbal abuse at work, which may also be considered a form of bullying. According to others, the prevalence of bullying may be even higher: 15% of workers may be affected at any point in time [6]. Despite this lack of convergence ~~on of~~ prevalence estimates, there is substantial agreement that workplace bullying is an emerging psychosocial risk with the potential to adversely affect the safety and health of working people [7].

Comment [A8]: Note that all citations must be in APA Author-Year format. As the reference list is not in this document, I could not make this change.

Comment [A9]: Please clarify if you are referring to all forms of bullying or specifically workplace bullying.

Most studies in this area have investigated the psychological health outcomes of exposure to bullying, ~~and have documenting documented~~ a significant relationship between bullying and psychosocial stress, which leading leads to anxiety and depression, including the onset of major depressive episodes [8–12]. It is now quite clear evident that exposure to bullying can lead to a profound deterioration of the ~~person's-victim's~~ psychological health, mainly primarily via experiences of stress experiences [13]. However, Few few studies, ~~however,~~ have investigated the potential impact of bullying on outcomes other than psychological ~~ones~~ aspects. Thus, it remains to be seen unknown whether bullying has the same far-reaching profound effects on health effects as those, for example, of well-established psychosocial factors, such as job strain or effort-reward imbalance, which have been found to deteriorate damage not only to psychological but also to physical health conditions [14]. Furthermore, researchers have noted that studying the relationships between among psychosocial factors, such as bullying, which are usually assessed through self-reports, and psychological outcomes, may be particularly subjected to common common-method bias due to personal factors such as negative affectivity, which may act as a critical confounding variable [15]. This further strengthens the relevance of assessing the potential effect of bullying on different kinds of health-related outcomes.

To address the gap in the literature presented above, in the present study we investigated d the relationship between exposure to bullying and very common work-related physical health problems, namely, musculoskeletal disorders (MSDs). MSDs are dysfunctions affecting muscles, bones, nerves, tendons, ligaments, joints, cartilages, and spinal discs; they are defined by sprains, strains, tears, soreness, pain, peripheral nerve disorders, and connective tissue injuries of the structures previously mentioned [16]. MSDs are the most often frequently reported health problem by workers in the European Union: 24.7% of them such individuals report back pain

Comment [A10]: These constructs need to be defined in order to help the reader understand 1) what do you mean by these terms, 2) why they might be associated with workplace bullying, and 3) how they have been linked to physical and psychological health. Without this information, the reader has trouble understanding the model that you are proposing.

and 22.8% report muscular pain in shoulders, neck, upper or lower limbs, or combinations of any or all of these. In the United States, MSDs are one of the main reasons for short- and long-term disability and early retirement [17, 18].

The most common ~~causes that lead~~antecedents to MSDs are biomechanical factors, ~~like~~ such as repetitive motion, excessive force, awkward postures, and prolonged sitting and standing ~~for long hours~~ [16]. However, psychosocial factors are also believed to be important for both the initial development of MSDs and the long-term disability that may follow [18–22]. While the precise mechanisms (e.g., cognitive, neuroendocrine, and musculoskeletal) through which psychosocial factors may affect MSDs have not been fully elucidated, an accepted hypothesis [23] is that psychosocial factors may operate indirectly. They may, for example, influence muscle tension or other physiological processes, ~~and decreasing~~decrease micropauses in muscle activity, and ~~as a consequence~~consequently, affect the perception of pain. Plausibly, such indirect effects ~~is are~~ exerted through the experience of work-related stress.

Field Code Changed

Most research on the impact of psychosocial factors on MSDs has focused on factors, such as psychological job demands and job control [24]. A review of the available evidence suggests that such factors (i.e., high demands and low control) are indeed related to MSDs, specifically of the neck, shoulder, and back [25]. ~~As far as~~Regarding exposure to bullying ~~is concerned~~, we ~~traced found~~ two studies ~~that exploring~~explored its relationship ~~with to~~ MSDs. A study ~~on of~~ 370 Lithuanian seafarers ~~published as a conference abstract~~ revealed that exposure to bullying was significantly associated with an overall measure of upper limb MSDs [26]. Another study ~~conducted on of~~ 1024 employees of a Norwegian bus company revealed an association between exposure to bullying and ~~a measure of~~ musculoskeletal complaints, including headache, backache, neck ache, and hand and foot pain [27]. ~~However, the latter study did not control for~~

Comment [A11]: I don't see how this information is relevant.

potentially confounding factors, such as physical load factors. Furthermore, neither study followed recent recommendations that emphasizing-emphasize the importance of investigating specific forms of MSDs [25].

Comment [A12]: Not all readers will be familiar with “physical load factors,” so I suggest adding a line or two for the benefit of these readers.

Thus, in the present study, we ~~further~~-investigated the relationship between exposure to bullying and MSDs ~~by-while~~ controlling for potentially confounding factors and focusing on specific musculoskeletal problems. Furthermore, we explored whether job-related strain may ~~indeed~~-act as a mediator in the relationship between exposure to bullying and MSDs, as Silverstein and Evanoff [23] hypothesized and, ~~indeed~~, as Sprigg et al. [24] found for other psychosocial risk factors.

2. Methods

2.1. Study Design and Sample

A cross-sectional survey was conducted in a large retail company in Italy. A total of 553 ~~of the organization’s 812 employees~~ ~~workers~~ voluntarily participated in the study, ~~after researchers obtained a randomized sample from the organization’s 812 workers~~ (response rate: 68.1% ~~-was the response rate~~). All participants worked in grocery stores belonging to the ~~same~~ organization; therefore all ~~of them~~ ~~individuals~~ ~~have~~ ~~were~~ ~~exposed to~~ the same procedures and company regulations. The sample was composed of both supervisors and employees. Participants worked in different departments of the supermarkets (e.g., gastronomy, fruit and vegetables, butchery, fish, bakery, cashiers, and nonfood); thus, they all performed job activities with high physical demands.

Comment [A13]: This is more usually used to refer to the study/consumption of fine foods — I suspect you mean something else, such as “luxury foods.” Please clarify.

Workers were assembled in different groups and, after one hour of training on work-related stress, they completed an anonymous, self-administered questionnaire. The contents of

this brief training session ~~were addressed~~ the main European and national regulations ~~about~~ regarding work-related stress and the main definitions of work-related stress used in the literature. This training hour ~~was included~~occurred before ~~filling the participants completed~~ the questionnaire, in order to explain to the workers that the aim of the study was not to define ~~how much~~the extent to which they were stressed, but only to understand which psychosocial risk factors could contribute to enhancing strain and decreasing workers' health.

2.2. Measures

Workplace bullying is normally assessed either by using the respondents' feelings of being victimized by bullying (e.g., [9]), usually according to a given specific definition of the phenomenon, or according to the respondents' perception of being exposed to a range of specific bullying behaviours described without explicit reference to the ~~term-term~~ "bullying-bullying" (e.g., [28]). The first method is the so-called self-labelling approach; ~~however, which,~~ however, this approach is very subjective and strongly influenced by personality, ~~and~~ emotional, and cognitive factors, including possible misperceptions. The second method is the behavioural experience method, which is generally believed to be more objective because it is relatively less exposed to the effect of personal factors. Thus, in the present study, we used the latter approach and assessed bullying ~~with using~~ the Italian version of the Short Negative Acts Questionnaire (S-NAQ) [29], which has been validated in Italy ~~with an ad hoc study~~ [30]. The scale consists of 9 items ~~that investigating investigate~~ how often the respondent has experienced a variety of negative behaviours at work during the ~~last previous~~ six months. One example item is "Someone withholding information, which affects your performance." ~~and workers could~~Respondents answer ~~on using~~ a 5-point Likert ~~(scale ranging from 1 (= never) to 5 (= daily))~~. Item ~~scores were~~ are then averaged to provide an overall score. ~~Using Italian data, The the~~ S-NAQ has ~~shown~~

Comment [A14]: It is unclear what is meant by an "ad hoc" study. This term usually refers to something that is unplanned, which seems unlikely to be the case for a study. Please clarify your meaning here.

~~exhibited~~ psychometric properties ~~using Italian data, which are~~ entirely comparable to those of the original, ~~and~~ longer (i.e., 22-item) version ~~of the scale~~, for example, in terms of associations with ~~variables of~~ mental health ~~variables~~ and well-being [30].

Job-related strain was measured through the dimension of emotional exhaustion of the Maslach Burnout Inventory General Survey (MBI-GS: [31]; Italian version [32]). The ~~five -~~ items ~~of the scale~~ ~~was are each~~ scored ~~in terms of frequency using on~~ a 7-point ~~frequency~~-Likert scale (0 = *never* to 6 = *every day*). One example item is ~~as follows~~: “I feel emotionally drained from my work.” Items ~~were are then~~ averaged ~~to produce an overall score~~.

Musculoskeletal disorders were ~~measured assessed~~ through ~~4-four~~ items related to four different parts of the body: low back, upper back, neck, and shoulders. The question was, “During the past 12 months have you had pain, aching, stiffness, burning, numbness, or tingling (~~“(pins and needles”)~~) in any areas of the following that occurred more than three times or at least more than a week?” The possible answers were either “yes” or “no.”

In addition ~~to those variables~~, possible confounding variables were included: gender, age, organizational role, ~~and~~ type of contract. Furthermore, as participants were working in a large retail company, we introduced physical job demands, ~~as~~ measured ~~with using~~ the Italian version [33] of Karasek’s [34] Job Content Questionnaire, as a control variable. The scale consists of ~~5~~ ~~five~~ items with response options ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). One example item is “I am often required to move or lift very heavy loads on my job.” Items ~~were are~~ ~~then~~ averaged ~~to produce an overall score~~.

2.3. Statistical Analysis

Logistic regression models were fitted to the data by using the software SPSS version 20.0 ~~software~~. The risk factor was bullying, while the outcome variables were four specific MSDs of the low back, upper back, neck, and shoulders. To test ~~for the~~ possible mediating role played by job-related strain (i.e., emotional exhaustion) in the relationship between exposure to bullying and MSDs, we adopted the analytical approach of Preacher and Hayes [35] ~~analytical approach~~. This approach tests the indirect relationship between an exposure factor and an outcome through a mediator by using a bootstrap (i.e., resampling) procedure that addresses some weaknesses associated with the Sobel test [35]. To compute the direct and indirect effects, all path coefficients in the model were estimated concurrently. Furthermore, the bootstrapping procedure was used to compute formal statistical tests of the specific indirect effects. This method can produce an estimate of the indirect effect, including a 95% confidence interval. When the 95% confidence interval does not include zero, the indirect effect is significantly ~~different between the level of zero and at~~ $p < 0.05$. Four different mediation analyses were performed, one for each specific MSD, that is, for the low back, upper back, neck, and shoulders.

Comment [A15]: Please follow the convention of listing the manufacturer and their location.

3. Results

3.1. Demographic and Working Characteristics of Subjects

Due to missing data, 41 cases were deleted; thus, the final sample consisted of 512 Italian workers, ~~whose mean age was 43.64 years ($SD = 7.8$), -Most of whom of them (322 workers, 62.9%) were female (322 workers, 62.9%) and the mean age was 43.64 years ($SD = 7.8$).~~ The mean occupational tenure was 16.15 years ($SD = 8.46$). Concerning the type of contract, 52.3% had a part-time contract, while all other workers had a full-time contract. Concerning the organizational role, 94 workers (18.4%) were supervisors, while 418 were employees (81.6%).

3.2. Descriptive Statistics, Correlations, and Mediation Effect of Job-Related Strain

Mediation Effect between Bullying and MSDs

Means, standard deviations, percentages, internal consistencies, and correlations were computed for all the study variables (Table 1). Internal consistencies (Cronbach's α) of the ~~used~~ scales were good, as all ~~the~~ values exceeded the threshold of 0.70 [36]. Exposure to bullying behaviours was relatively low, ~~meaning that is~~, on average, employees only occasionally experienced ~~these~~ negative acts that are the essence of bullying (Table 1). ~~The obtained mean value of 1.67 at of the bullying measure is similar to that commonly found in organizational research in this area in which the same operationalization of bullying is was used [37, 38]. A~~ Closer inspection of the distribution of the bullying ~~variable scores~~ revealed that 3.51% of employees (not reported in Table 1) reported a score indicating ~~an~~ exposure on a weekly or daily basis to the bullying behaviours investigated.

Add Table 1 here

~~On the~~ In contrary contrast, job-related strain and physical demands were relatively more prevalent than bullying, with their ~~average levels means~~ (i.e., 17.30 and 2.71, resp ~~ectively~~) being above the central point of ~~the adopted each~~ response scale. For example, ~~a the mean~~ score of 2.71 ~~at on~~ the physical demand scale ~~meant indicated~~ that all ~~the~~ five investigated aspects ~~describing a of~~ high physical demands tended to be reported by most ~~of~~ participants. ~~As far as~~ Regarding musculoskeletal problems ~~are concerned~~, in general they were highly prevalent among participants, with the highest prevalence being for the low back problems.

Comment [A16]: This should be moved to the Discussion section. I haven't made the change because I did not want to disrupt the citation numbering.

Comment [A17]: This language is a bit too imprecise for the Results section. I would recommend that you are specific about the results that were found, using numerical and statistical values.

Furthermore, ~~the results~~, presented in Table 1, showed that, ~~among the all~~ confounding variables (~~i.e.~~, age, gender, ~~organisational-organizational~~ role, type of contract, and physical demands), ~~all of them~~ were related to at least one of the outcome variables ~~considered~~ (~~i.e.~~, MSDs of low back, upper back, neck, and shoulders). Thus, these confounding variables ~~have been were~~ included in the mediation analysis.

Comment [A18]: I would recommend that you add more detail about how you determined that each of these variables were confounding variables, as it is not clearly explained here, or in the Statistical Analysis section above.

~~In order to~~ To test our hypothesis, which ~~postulates-postulated~~ that strain mediates ~~the relationship~~ between bullying and MSDs, four mediation analyses ~~have been were~~ performed. As mentioned ~~before earlier~~, the ~~analytical approach of~~ Preacher and Hayes [35] ~~analytical approach~~ allowed us to test the direct and indirect effects of the variables considered. Thus, we provided estimates of all ~~the~~ path coefficients (Table 2), as well as indirect effects (Table 3), along with ~~bias-corrected, bootstrapped the 95% bias corrected, bootstrapped~~ confidence intervals for the four different musculoskeletal disorders (~~i.e.~~, low back, upper back, neck, and shoulders). Specifically, ~~in~~ Table 2, ~~presents~~ both results concerning the direct effects of the antecedent and confounding variables on the mediator (job-related strain) and results concerning the direct effects of the antecedents, confounding variables, and the mediator on the outcomes (MSDs of low back, upper back, neck, and shoulders) ~~are presented~~.

Add tables 2 and 3 here

~~Thus, concerning~~ the direct effects, bullying ~~has had~~ a positive effect on strain and on all ~~the~~ MSDs ~~considered~~, except for MSD of the shoulders. ~~This means that is, the more greater~~ ~~the workers' are exposure~~ to bullying, the more they reported MSDs of the low back, upper

Comment [A19]: The reader needs to be able to read and reference your key findings in the main text, without having to consult the tables or figures. Thus, I would recommend that you add details that are specific about the results that you found for your models.

back, and neck. ~~Also~~ Additionally, work-related strain ~~is was~~ directly related to all MSDs, except for ~~the~~ shoulders. ~~Looking at~~ Of the possible confounding variables, perceived physical demands ~~has an~~ affected both ~~on~~ strain and ~~on~~ all MSDs, while age ~~affects~~ affected strain and only MSD of the shoulders. ~~Regarding gender,~~ Females reported ~~ed~~ more MSDs ~~than males,~~ but not higher strain. Organizational role and type of contract ~~seem to~~ did not have an effect on either strain or MSDs.

Comment [A20]: This language isn't entirely clear, as I believe that MSDs were dichotomized into yes/no variables. I would reword this slightly to say, "...the more likely they were to report a MSD in their lower back, upper back, and neck."

Results concerning the indirect effects between the independent variable (bullying) and the outcomes variables (MSDs of low back, upper back, neck, and shoulders) are presented in Table 3. ~~Results show that~~ Job-related strain ~~mediates~~ mediated the relationship between bullying and all MSDs, except for MSDs of the shoulders. ~~Those results mean~~ That is, except for the MSDs of shoulders, strain ~~helps~~ helped in understanding the process between bullying and musculoskeletal disorders. ~~as~~ The results presented in Table 3 show that bullying affects strain, which in turn affects MSDs ~~(of the~~ low back, upper back, and neck).

4. Discussion

Even though psychosocial risk factors have been ~~found to be~~ implicated in the development of MSDs (see, ~~for a review,~~ [20] ~~for a review~~), most studies in this area have been inspired by Karasek et al.'s [39] psychosocial model and ~~have~~ investigated the role of psychological job demands (i.e., workload) and decision latitude (i.e., job control) on MSDs [24]. ~~Having to do with the~~ With respect to tasks performed by ~~the worker~~ employees, job demands and decision latitude are typical job content factors (see European Agency for Safety and Health at Work [40]). Psychosocial contextual factors, such as those describing the quality of relationships at work, have rarely been examined in detail. ~~As far as~~ Regarding workplace bullying ~~is~~ specifically concerned, only a few studies have explored the relationship between exposure to

Comment [A21]: This section is a tad too long and needs some restructuring. Consider starting with a summary of your key findings. Discuss the generalizability of your findings. You can add subheadings to the section for the benefit of the readers.

such contextual factors and MSDs [26, 27]. However, such studies ~~have did~~ not adopted a fine-grained approach ~~on toward~~ MSDs or included an overall index of MSDs; ~~these facts render~~ ~~prior studies~~ ~~which is~~ less informative ~~than ideal~~ and generally ~~not recommended~~ of limited utility [25]. Furthermore, there is a substantial lack of knowledge ~~about regarding~~ the possible mechanisms ~~for explaining underlying~~ the link between psychosocial factors and MSDs. The experience of psychological strain has been ~~hypothesised~~ ~~hypothesized~~ as one such mechanism [23], but its involvement has rarely been directly explored.

Our results confirm that exposure to bullying behaviour is linked to MSDs (in the low back, upper back, and neck regions). ~~Of the body regions considered, Only only~~ the shoulders ~~do not seem~~ ~~ed~~ ~~un~~affected by this mediation. The results suggest that, along with the direct effect between bullying and MSDs ~~(of the~~ low back, upper back, and neck), there is a process ~~which that comprises includes~~ job-related strain between workplace bullying and MSDs. Therefore this relationship ~~ought to should~~ be ~~explained explicable~~ by both the direct effect of bullying as a psychosocial factor and the indirect effect of psychological strain manifesting as MSDs. Furthermore, despite physical demands remaining the main predictor of MSDs, when strain is considered, the effect of bullying on MSDs is quite similar, ~~(especially on the basis of with~~ ~~respect to~~ the upper back and neck).

~~Seeing that As~~ exposure to bullying can lead to a profound deterioration of the victim's psychological health, mainly via the experience of stress [13], the same mechanism seems to also influence physical health, specifically MSDs. ~~Formerly Previously,~~ Vie et al. [27] found both positive and negative emotions mediate the relationship between exposure to bullying and musculoskeletal complaints, ~~even al if it seems that though~~ negative emotion, namely, stress, is the main mediator. ~~In line with~~ ~~Consistent with~~ this ~~prior~~ study, to our knowledge, ~~this the current~~

~~study is provides~~ the first direct evidence of job-related strain as a mediator between bullying and MSDs. Therefore, the strain process, which ~~notoriously may is well known to~~ affect the body, ~~for example, such as~~ by producing tension in the musculature, is ~~one of the an~~ elements to consider ~~as we comprehend in~~ the detrimental effects of bullying on the victims' health. Note that we only found evidence for ~~a~~ partial mediation by psychological strain, since ~~in the for~~ three ~~of the cases MSDs had~~ psychological strain acted as a mediator ~~(i.e., of pain in the low back, upper back, and neck), and~~ bullying would have remained a significant risk factor for the investigated MSD in the final model.

One explanation for the direct effect between bullying and MSDs could be that we operationalized psychological strain in terms of emotional exhaustion, which mainly taps low-arousal symptoms, such as feelings of fatigue and depression, ~~and thus we capturing-captured~~ only certain ~~kinds of~~ manifestations of psychological strain. High-arousal symptoms such as anxiety and irritability, which are not well represented in the emotional exhaustion construct, may be even more critical in mediating the effect of bullying on MSDs. This is because bullying has been shown to generate strong feelings of anxiety and, eventually, disorders in those who are exposed [3]; at the same time, anxiety has been found to be one of the stronger affective mediators of the relationship between psychosocial aspects of work and MSDs [41]. In brief, ~~there it is room to believe plausible~~ that the psychological strain generated by exposure to bullying may have an even more important role in the occurrence of MSDs than that found in the present study. This suggests the need for more research in this area.

One of the main strengths of this study is the focus on workplace bullying as a psychosocial risk factor for MSDs. Even though NIOSH [16] considers these health complaints an important occupational disease, relative to other psychosocial risk factors, they ~~are still remain~~

understudied. Another strong point is ~~represented by the fact~~ that work characteristics, workplace bullying, stress, and MSDs ~~are were~~ studied ~~together~~ concurrently. Usually, the relationships between work characteristics, bullying, and stress ~~find evidence~~ are reported in ~~stress or the~~ psychological literature, whereas the relationships between work characteristics and MSDs are predominantly found within the medical, ergonomic, and epidemiological fields [24].

~~These strong points, however, do have~~ The current study has some limitations that should be ~~mentioned~~ recognized. First, the sample was not representative of a working population or of workers in the retail sector, which might decrease ~~the the opportunity to generalize~~ the of the ~~obtained~~ results. ~~A s~~ Second, limitation of the present study is that it the study is was cross-sectional; ~~so as such, we cannot~~ could not strengthen the basis for make causal inferences regarding MSDs. Therefore, adopting a rigorous longitudinal research design would ~~reduce the likelihood of~~ allow the the current findings ~~having arisen due to chance~~ to be verified and would ~~facilitate~~ allow us to investigate ~~ion of~~ the ~~effective~~ impact that bullying has on workers who develop MSDs. ~~Moreover, the adopted measures were~~ paper-and-pencil reports ~~were used in the study~~, which can lead to biased responses from the subjects. Although ~~adopting~~ assessing MSDs via self-report represents a limitation, evidence suggests that questionnaires are more sensitive indicators of MSD problems than preexisting data sources [42]. ~~However, i~~ In this study, objective measures ~~would be suitable only for assessing the of~~ MSDs could have been obtained via examinations such as, ~~for instance, by~~ medical evaluations. ~~On the other hand~~ In contrast, attempting to collecting objective measures of ~~the presence of~~ bullying in the workplace would not be feasible, due to problems ~~linked to the~~ associated with measures of negative activities, such as bullying, which are subjective and difficult to identify [43]. Furthermore, it is ~~not~~ impossible to ~~state~~ know whether the training session ~~could have~~ partly impacted the workers'

Comment [A22]: It seems that you have more than 2 limitations. I suggest numbering all of them instead of using transitional words like "Moreover" and "Furthermore."

response rate. ~~However, but that~~ the session was considered necessary, ~~including also from~~ by the company management, as ~~workers-employees had needed~~ to answer ~~to~~ questions concerning their health and potential issues concerning bullying at work. A final limitation is that the ~~adopted~~ measure of workplace bullying ~~insisted-considered~~ exclusively ~~on~~ repetitive and prolonged exposure to negative workplace behaviours, ~~and~~ thus ~~ignoring-ignored~~ other important defining elements of the bullying definition, such as the perceived imbalance of power between target and perpetrator(s). ~~Although in~~ Measures ~~insisting on~~ of exposure to negative acts are often used in the literature and ~~they~~ are ~~also~~ recommended when the aim of the study is to ~~look at~~ assess the relationship between bullying and other variables [44]. ~~However~~, such measures ~~are represent far from being an~~ imperfect operationalization of bullying.

Despite these limitations, the current findings have ~~practical~~ implications ~~and implications~~ for future research ~~directions and for practical implications~~. ~~Indeed, f~~For future studies on psychosocial risk factors and MSDs, it may be interesting to investigate not only job demands (~~e.g., specifically~~ workload and lack of autonomy, which are often studied as psychosocial risk factors associated with MSDs [45, 46]); but also perceptions of work life quality and relationships within the workplace. In this study, initial outcomes of such relationships ~~have been~~ were reported, although further study is needed ~~not only~~ pertaining to workplace bullying, ~~but as well as relative to~~ the wider category of psychosocial contextual factors (i.e., role clarity, work-family conflict). ~~Until now~~ To date, these have not been studied in relation to MSDs, ~~however yet~~ they are known ~~to have an effect on~~ health. Moreover, future research should also investigate the reciprocal relationship between bullying, job-related strain, and MSDs.

Regarding practical implications, our results underline that, in addition to more traditional prevention strategies used to diminish biomechanical risk factors, establishing prevention strategies to reduce the presence of psychosocial risk factors (e.g., in particular, workplace bullying) in the organization of workplace should also be considered. Additionally, the mediating role of job-related strain suggests that the good practices mentioned above relative to regarding ergonomic characteristics in of the workplace cannot be decisive in solving the issue. When addressing MSDs, both biomechanical and psychological sources should be included. Therefore, Our our results, therefore, show that bullying can be the initiator of the process which that could lead to engenders an increase of in MSDs. This indicating indicates the need to promote primary prevention intervention in the workplace to reduce bullying and, as a consequence, decrease perceived job-related strain and MSDs. Diverse-Numerous studies have confirmed the role of organizational factors affecting in bullying, such as perceived cognitive, emotional, and behavioral social support from colleagues [47]; perceived organisational-organizational support [48]; and psychological safety climate [49]. Therefore our findings are in line consistent with a prevention perspective, in which the contextual factors have the most potential for broad impacts in reducing bullying and its effects, as they prevention can be implemented in the workplace [50, 51]. Acting d Directly on the preventing bullying prevention can help to reduce negative health outcomes, such as the MSDs presented-considered here.

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