

Article

The Perceived Risk of Being Infected with COVID-19 at Work, Communication, and Employee Health: A Longitudinal Application of the Job Demands–Resources Model

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Abstract: The perceived risk of being infected at work (PRIW) with COVID-19 represents a potential risk factor for workers during the current COVID-19 pandemic. In line with the job demands–resources (JD-R) model in the context of safety at work, in this longitudinal study we propose that PRIW can be conceptualized as a job demand (JD), whereas communication (i.e., the exchange of good-quality information across team members) can be conceived of as a job resource (JR). Accordingly, we hypothesize that PRIW at Time 1 (T1) would positively predict psychophysical strain at Time 2 (i.e., four months later), and that communication at T1 would negatively predict psychophysical strain at T2. Overall, 297 workers participated in the study. The hypothesized relationships were tested using multiple regression analysis. The results support our predictions: PRIW positively predicted psychophysical strain over time, whereas communication negatively predicted psychophysical strain over time. The results did not change after controlling for age, gender, and type of contract. Overall, this study suggests that PRIW and communication might be conceived of as a risk and a protective factor for work-related stress, respectively. Hence, to promote more sustainable working conditions, interventions should help organizations to promote an adequate balance between JDs and JRs related to COVID-19.

Keywords: COVID-19; perceived risk; communication; psychophysical strain; longitudinal study

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1. Introduction

The current historical situation is characterized by the worldwide health emergency caused by COVID-19, an infectious disease that, starting from December 2019, quickly took the form of a pandemic. Since then, the COVID-19 pandemic has been deeply affecting people's everyday life, with consequences in the family, education, and work domains [1–3]. Regarding the work context, workers in many occupational sectors, in addition to healthcare professionals, are now potentially exposed to the risk of infection with COVID-19 at work [3], with the risks of major health (both physical and mental), social (e.g., social exclusion), and economic (e.g., financial loss) consequences [4]. Therefore, in the context of the current pandemic, safety at work—both physical and psychological—plays a key role for organizations, which have to maintain their operations while concurrently sustaining employees' psychophysical health and well-being [5]. Hence, to promote more sustainable working conditions aimed at fostering employees' health and well-being during the ongoing pandemic, work-related factors that may be associated with physical and/or psychological consequences related to COVID-19 risk (e.g., being infected with COVID-19 and psychophysical symptoms associated with work-related stress, respectively) need to be thoroughly considered and addressed. In light of this scenario, in this

longitudinal study we investigated the association over time between two work-related factors linked to COVID-19 risk, namely, the perceived risk of being infected at work (PRIW) with COVID-19 [6] and communication among team members [7–9] on the one hand, and psychophysical strain, in terms of psychophysical symptoms related to work-related stress (WRS) on the other [10,11]. More specifically, based on the Job Demands–Resources (JD-R) model [12,13] in the context of safety at work [14–16], we conceptualized PRIW as a job demand (JD), that is, a risk factor for WRS, which may have negative consequences on employees' health and well-being over time. On the contrary, we conceived of communication as a job resource (JR), that is, a protective factor for WRS, which may help in preventing negative health consequences over time. We elaborate on these arguments in the following section.

Job Demands and Resources in the Context of Safety at Work

According to the JD-R, characteristics of the job can be categorized as JDs or JRs. The former refers to “those physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological effort and are therefore associated with certain physiological and/or psychological costs” (p.274) [12]. Conversely, JRs are “those physical, psychological, social, or organizational aspects of the job that are functional in achieving work goals, reduce job demands and the associated physiological and psychological costs, or stimulate personal growth, learning, and development” (p.274) [12]. In line with the JD-R, JDs and JRs trigger two different processes: a health impairment and a motivational process, respectively. In this study, we focused on the former, according to which chronic JDs require effort and deplete workers' mental and physical resources, possibly leading to exhaustion and health complaints over time [12,13]. Moreover, a lack of JRs thwarts the achievement of one's work goals, which may result in psychophysical symptoms and job burnout over time [17–19].

Risk perception can be conceptualized as the “subjective assessment of the probability of a specified type of accident happening and how concerned we are with such an event” (p.152) [20], which implies a cognitive and an emotional component of risk perception [21,22]. Recently, researchers around the world have focused on the perceived risk of COVID-19 infection in the general population [23,24] and in the working population, including healthcare professionals [25–27] as well as workers from different occupational sectors [6,28]. The growing attention towards the risk of infection at work is consistent with the fact that workplaces and work organization have some characteristics that may enhance the spread of SARS-CoV-2, such as, for example, physical proximity and frequent social interactions [29]. According to the definition of JD and the health impairment process, PRIW requires effort (e.g., to comply with safety procedures and/or to handle risky situations at work) and exhausts workers' resources, both mental and physical (e.g., time and energy), which may lead to the onset of psychophysical strain over time.

Communication is a central element of a good teamwork that refers to the exchange of good-quality (e.g., effective, clear, and honest) information and feedback across team members (i.e., colleagues and supervisors) [6–9,30]. In this study, we conceived of communication as a JR. Indeed, high-quality communication may be functional in reaching work goals, regarding both productivity and safety outcomes (i.e., communication may play a motivational role) [6]. Furthermore, by allowing workers to complete tasks more effectively, good communication may foster employees' perception of competence [7]. Accordingly, communication can replenish personal resources like physical/psychological energies and capacities, thus contributing to preventing exhaustion and negative health consequences over time [31].

Empirical evidence, although still scant, supports the idea of an association between PRIW and communication on the one hand (i.e., as a JD and a JR, respectively), and negative outcomes for the individual on the other. Recent research by Falco et al. [6] showed that PRIW was positively associated with emotional exhaustion, a core component of job burnout [32], whereas communication was negatively associated with it. However, the

study by Falco et al. employed a cross-sectional design, which did not inform about the direction of the associations. Hence, in the current research we addressed this limitation by using a longitudinal design. This allowed us to investigate whether PRIW and communication at Time 1 (T1) are predictive of psychophysical strain at Time 2 (T2, that is, four months later), controlling for initial levels of psychophysical strain [33].

All in all, based on the results of previous research, and given the assumptions of the JD-R model, we hypothesized that PRIW at T1 will positively predict psychophysical strain at T2. Specifically, higher levels of PRIW will be associated with higher levels of psychophysical strain four months later, controlling for initial levels of psychophysical strain.

Hypothesis 1 (H1): *PRIW at T1 will positively predict psychophysical strain at T2.*

Similarly, we hypothesized that communication at T1 will negatively predict psychophysical strain at T2. Specifically, higher levels of communication will be associated with lower levels of psychophysical strain four months later, controlling for initial levels of psychophysical strain.

Hypothesis 2 (H2): *Communication at T1 will negatively predict psychophysical strain at T2.*

Finally, demographic characteristics including gender and age, as well as work-related factors such as the type of contract, may be associated with psychophysical strain. Regarding gender, previous studies in the organizational context showed that women tend to report higher levels of psychophysical strain [34–36]. A proposed explanation is that women may experience higher levels of work–home interference [37] and lower levels of JRs (e.g., social support) [35], which in turn might result in higher levels of psychophysical strain [38]. Previous research has also shown age to be associated with psychophysical strain, albeit results have not been conclusive. For example, a positive association between age and psychophysical strain may exist [39,40], given that symptoms take time to develop, so elevated levels of psychophysical strain reflect the cumulative effect of persistent or chronic WRS at the end of a worker’s career [41,42]. Conversely, psychophysical strain may be negatively associated with age, possibly because older employees have higher levels of resilience or develop effective coping skills with age or experience [43,44]. Interestingly, the relationship between age and psychophysical strain might differ across gender [42,45]. Finally, with respect to the type of contract, past research has shown an association between temporary employment and psychophysical strain, although with some differences across studies [46–49]. A possible explanation is that temporary employees may have unfavorable employment conditions (e.g., low wages, involuntary part-time), less job security, and less participative decision-making, which may have detrimental effects on workers’ health [46,50,51]. Given the possible association between gender, age, and type of contract on the one hand, and psychophysical strain on the other, the hypothesized relationships were analyzed both controlling for and not controlling for these demographic and work-related factors.

2. Materials and Methods

2.1. Participants and Procedures

The study was carried out in Italy and included a sample of workers from different organizations. Participants were approached by trained research assistants and were invited to take part in a study about their work experience. Participants had to be employed at the time of study and were recruited through snowball sampling. Briefly, the initial participants were contacted by research assistants and were invited to complete an online questionnaire. They were also informed that they would be asked to complete a second questionnaire four months later. Then, participants were asked to provide contact information for other individuals potentially interested in taking part in the research (e.g., colleagues), who were in turn approached by the research assistants, and so on. All participants were also informed of the overall purpose of the study, that participation was

voluntary and confidential, and that they could withdraw from the research at any time. Upon acceptance, they were provided with a link that included the informed consent form and a questionnaire. All participants had to provide written informed consent before participating in the study. The research project was approved by the Ethics Committee for Psychological Research of the University of Padua, Italy (protocol n. 3842). Participants completed a first questionnaire between the end of October 2020 and the first half of November 2020 (i.e., T1). They also completed a second questionnaire four months later (i.e., T2, between the end of February 2021 and the first half of March 2021). The two data collections roughly overlapped with two distinct phases of the pandemic in Italy: the second wave and the third wave, respectively [52]. Both epidemic waves were characterized by a substantial spread of SARS-CoV-2. The median R_t index was 1.34 at T1 and 1.19 at T2 (data from the Italian National Institute of Health, <https://covid19.infn.it/iss/>, accessed on 22 December 2021), and new confirmed cases of COVID-19 per million people ranged from 281.7 to 677.5 at T1, and from 159.3 to 443.8 at T2 [53], with approximately five million people receiving at least one vaccine dose by the end of the second survey date (starting on 27 December 2020) [54]. Overall, 505 participants completed the questionnaire at T1, and 310 (61.4%) completed the questionnaire at both T1 and T2. There were no differences in control (i.e., gender, age, and type of contract) or study variables between participants who did and did not complete the T2 questionnaire. Thirteen participants had missing data in at least one of the variables of interest for the current study. The results of Little's test showed that data were missing completely at random ($\chi^2 = 43.70$, $df = 37$, $p = 0.21$), and cases with missing data in any of the study variables were removed from the dataset. Hence, the final sample of the study included 297 participants. The sample consisted of 166 women (55.9%) and 131 men (44.1%). The mean age was 36.9 years ($SD = 12.3$). With respect to the type of contract, 76 workers (25.6%) had a temporary contract, whereas 221 workers (74.4%) had a permanent contract. Regarding education, 168 workers (56.6%) held a secondary degree, and 125 workers (42.1%) had a university degree (4 missing values, 1.3%). Finally, with respect to work experience, most of the workers (48.5%) had been in their current organization for less than 5 years and 29.6% for more than 10 years (5 missing values, 1.7%).

2.2. Self-report Measures

Psychophysical strain was assessed at T1 and T2 using a scale (14 items) taken from the Qu-Bo test [55], an instrument that has been standardized for the Italian context. More specifically, the Qu-Bo test is designed for the assessment of WRS risk and includes scales that measure job demands and resources (i.e., risk and protective factors for WRS, respectively), personal demands and resources, as well as possible outcomes of the stress process, such as psychophysical strain and impaired well-being. With respect to psychophysical strain, respondents were asked to indicate how often stress-related psychophysical symptoms had appeared or exacerbated over the past two months on a six-point response scale ranging from 1 (never) to 6 (every day). Sample items are as follows: "feeling tense and nervous" and "heartburn or pain in the stomach." Cronbach's alpha for the overall scale was 0.92 at T1 and 0.94 at T2.

The PRIW was measured at T1 using an adaptation of the COVID-19 Perceived Risk Scale (CPRS) [56] to the work context, namely, the CPRS-W [6]. The CPRS-W includes an emotional dimension as well as a cognitive dimension of risk perception. Sample items are as follows: "How worried are you about contracting COVID-19 in your work organization?" and "What is the likelihood that you would acquire COVID-19 in your work organization compared to your colleagues/supervisors?" respectively. The five-point response scale ranged from 1 (negligible) to 5 (very large). In line with the authors' suggestions [56] and previous validation [6], an overall score of perceived risk was computed. Cronbach's alpha for the overall CPRS-W scale was 0.90.

Communication refers to the exchange of good-quality information and feedback across team members, including colleagues and supervisors, and it was assessed at T1

using a scale composed of 4 items taken from the Qu-Bo test [55]. A sample item is "In my work group, communication is clear and timely." The response scale ranged from 1 (strongly disagree) to 6 (strongly agree). Cronbach's alpha was 0.91.

2.3. Data Analysis

The relationships hypothesized in the study were tested using multiple regression analysis. Two different models were estimated. In model 1 (M1) psychophysical strain at T2 was the dependent variable, whereas psychophysical strain, PRIW, and communication at T1 were the independent variables. This model investigated whether PRIW and communication at T1 were predictive of psychophysical strain four months later, controlling for initial levels of psychophysical strain. Thus, M1 addresses the possible explanation for a relationship between the predictors at T1 (i.e., PRIW and communication) and the outcome at T2 (i.e., psychophysical strain) simply because of the existing relationship between the predictors and the outcome at T1 [33]. Model 2 (M2) was similar to M1, except that the relationships of interest were estimated after controlling for the effect of gender, age, and type of contract. To facilitate the interpretation of the results, the variables included in the models (with the exception of the dichotomous variables) were centered [33,57]. Prior to estimating the regression models aimed at hypothesis testing, a confirmatory factor analysis (CFA) was carried out to investigate whether the self-report measures administered in this study reflected different constructs. The CFA was carried out using the maximum likelihood method with robust standard errors and a scaled test statistic (i.e., robust maximum likelihood, MLR) as an estimator [58]. To evaluate the model fit, the scaled chi-square test was used together with additional fit indices. These were the root mean square error of approximation (RMSEA), the comparative fit index (CFI), and the standardized root mean square residual (SRMR). Values close to or smaller than 0.08 for RMSEA and SRMR and values close to or greater than 0.90 for CFI indicate acceptable model fit, whereas values close to 0.06 and 0.95 for RMSEA and CFI, respectively, indicate good fit [59]. Statistical analyses were carried out using the software R version 4.0.3 (R Core Team), and the CFA was estimated using the lavaan package version 0.6–9 [58] for R software.

3. Results of Confirmatory Factor Analysis

First, a CFA was carried out to investigate whether the self-report measures administered in this study reflected different constructs. The fit indices showed a good fit to the data: $\chi^2(66) = 94.72$, $p = 0.01$; RMSEA = 0.038, 90% CI = 0.021–0.053, CFI = 0.982, SRMR = 0.038. Factor loadings ranged from 0.59 to 0.89, whereas the correlations between the latent variables ranged from −0.32 (between communication at T1 and psychophysical strain at T2) to 0.68 (between psychophysical strain across waves). These results suggest that the self-report measures administered in this study adequately reflected different constructs.

Hypothesis testing

Correlations between study variables as well as descriptive statistics are reported in Table 1. There was a positive, large correlation between psychophysical strain at T1 and psychophysical strain at T2 ($r_{295} = 0.64$, $p < 0.001$). Furthermore, PRIW at T1 was positively associated with psychophysical strain at T2 ($r_{295} = 0.26$, $p < 0.001$), whereas communication at T1 was negatively associated with it ($r_{295} = -0.27$, $p < 0.001$).

Table 1. Means, standard deviations, and correlations between study variables ($N = 297$).

Variable	<i>M</i>	<i>SD</i>	1	2	3	4
1. Psychophysical strain (T2)	2.25	1.07	—			
2. Psychophysical strain (T1)	2.10	0.96	0.64***	—		
3. Perceived risk (T1)	2.43	0.88	0.26***	0.25***	—	
4. Communication (T1)	3.51	1.42	−0.27***	−0.26***	−0.12*	—

Note: T2 = Time 2; T1 = Time 1; perceived risk = perceived risk of being infected at work; * $p < 0.05$.

*** $p < 0.001$.

The results of the multiple regression analyses for M1 and M2 are presented in Table 2. In M2, the control variables at T1 were not associated with psychophysical strain at T2, and the results were very similar across the two models. Hence, the results of M1 (i.e., the more parsimonious model) are discussed [60,61]. Psychophysical strain at T1 positively predicted psychophysical strain at T2 ($b = 0.66$, $SE = 0.05$, $p < 0.001$, $\beta = 0.59$), suggesting that strain is relatively stable across waves. The inclusion of PRIW and communication at T1 in M1 explained an additional 2% of the variance in psychophysical strain at T2 ($F_{change}(2, 293) = 5.45$, $p < 0.01$). PRIW at T1 positively predicted psychophysical strain at T2 ($b = 0.12$, $SE = 0.05$, $p < 0.05$, $\beta = 0.10$), whereas communication at T1 negatively predicted psychophysical strain at T2 ($b = -0.08$, $SE = 0.03$, $p < 0.05$, $\beta = -0.10$). Overall, the predictors at T1 accounted for over 40% of the variance in psychophysical strain at T2 ($R^2 = 0.44$, $F(3, 293) = 75.52$, $p < 0.001$). Hence, hypotheses 1 and 2 were supported.

Table 2. Results from multiple regression analyses: Model 1 and Model 2 ($N = 297$).

Dependent Variable: Psychophysical Strain (T2)	Model 1		Model 2	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept	2.25***	0.05	2.29***	0.07
Gender ¹			−0.13	0.10
Age			0.00	0.00
Type of contract ²			0.07	0.12
Psychophysical strain (T1)	0.66***	0.05	0.64***	0.05
Perceived risk (T1)	0.12*	0.05	0.12*	0.05
Communication (T1)	−0.08*	0.03	−0.08*	0.03

Note: T2 = Time 2; T1 = Time 1; perceived risk = perceived risk of being infected at work; ¹ female = 0, male = 1; ² permanent contract = 0, temporary contract = 1; * $p < 0.05$. *** $p < 0.001$.

4. Discussion

The ongoing outbreak of COVID-19 is a threat to global health and international economy [62] that has dramatically affected several areas of everyday life, including family, education, and work [1–3]. With respect to the latter, changes concern the labor market (e.g., job loss and increasing unemployment) [63], work practices (e.g., remote work and virtual teamwork) [62], and the accentuation of traditional risk factors (e.g., increased workload, job insecurity, and work–family conflict), as well as the emergence of new ones (e.g., social distancing and workplace loneliness) [62,64–67].

Not surprisingly, the perceived risk of infection at work has received growing attention worldwide, as the transmission of COVID-19 may occur in the workplace, and many jobs that were formerly considered relatively safe are now seen as potentially dangerous [68]. In this longitudinal study, building on the JD-R [12,13] applied to safety at work [14–16], we conceptualized PRIW as a JD that may have detrimental consequences on an employee's health and well-being over time. We also conceived of communication as a JR that may help in preventing negative health consequences over time. Accordingly, we hypothesized that PRIW at T1 would positively predict psychophysical strain at T2 (i.e., four months later), and that communication at T1 would negatively predict psychophysical strain at T2. The results largely support our predictions. The perceived risk of COVID-19 infection positively predicted psychophysical strain over time, so higher levels of PRIW were associated with higher levels of psychophysical strain four months later, controlling for initial levels of psychophysical strain. Similarly, communication negatively predicted psychophysical strain over time: Higher levels of communication were associated with lower levels of psychophysical strain four months later, controlling for initial levels of psychophysical strain. Controlling for age, gender, and type of contract did not change these results.

All in all, these results are consistent with the JD-R model, a flexible theoretical framework that has been contextualized for several work-related areas, such as work ability [69], career development [70], work–home interference [71], return to work after maternity

leave [72] and, more recently, safety at work during the current COVID-19 pandemic [6,27]. In addition, by using a longitudinal design, this study extends previous literature in this latter field—mostly based on cross-sectional findings—and suggests that PRIW and communication can be considered a risk and a protective factor for WRS, respectively.

Moreover, our results are consistent with previous studies on the relationship between PRIW and communication on the one hand, and psychophysical symptoms related to WRS on the other. With respect to PRIW, research carried out during different epidemics devoted considerable attention to healthcare workers (HCWs), who are at a higher risk of infection than the general population [73]. Consequently, HCWs may experience negative consequences in terms of WRS and psychological or physical symptoms [74,75]. For example, past research conducted among healthcare professionals during the SARS epidemic showed that HCWs perceived a great risk of personal exposure and fear of contracting the disease. They also reported increased work stress and workload and experienced significantly higher levels of anxiety [76,77]. Regarding the ongoing outbreak of COVID-19, several studies have shown that frontline HCWs (i.e., who had experience in treating contaminated patients) perceived their workplace as more hazardous as well as characterized by higher risk of infection [75,76]. Furthermore, PRIW was associated with WRS and anxiety in response to COVID-19 among HCWs [78]. Previous research, although still limited, also examined PRIW in the general working population [6,28,64]. For example, recent research by Falco et al. [6], carried out among workers from different organizations in Italy, showed that PRIW as a JD was positively associated with emotional exhaustion, a core component of job burn-out [32], and that JRs related to COVID-19 (e.g., communication, the presence of adequate safety systems, and participation in decision-making) buffered this association, which was stronger for individuals with low levels of resources.

With respect to communication, previous research in the context of different pandemics has shown that adequate communication about the epidemic (e.g., sharing exact information about infection, a clear communication about guidelines and precautions) was associated with lower psychophysical strain among HCWs [79]. For example, a study investigating the psychological impact of the H1N1 influenza pandemic in Japan showed that sharing correct information about infection is essential to contain the risk of stress among HCWs [80]. Moreover, clear communication about guidelines and precautions was also associated with fewer symptoms, assessed by the General Health Questionnaire in a sample of hospital employees in Singapore during the SARS epidemic [81]. Furthermore, the study by Falco et al. [6], carried out in the general working population, has shown that communication concerning COVID-19 risk (i.e., the exchange of information, feedback, or possible reactions among team members) was negatively associated with emotional exhaustion. However, it should be noted that the current study, by adopting a longitudinal design, extends previous research, which was mostly based on cross-sectional data, and contributes to contextualizing prior knowledge on the current COVID-19 outbreak.

Of course, some limitations need to be acknowledged. First, the reversed effect of psychophysical strain on PRIW/communication over time was not considered in this study. It is possible that workers reporting higher levels of psychophysical strain may also perceive higher levels of risk and lower levels of communication over time, given their diminished resources (e.g., psychophysical energies) to handle risky situations at work or to manage communications promptly and effectively, respectively. Hence, although the associations hypothesized in this study are consistent with the JD-R model and previous empirical evidence [14–16,27,82,83], a future cross-lagged panel model could further investigate the reciprocal association over time between PRIW/communication and psychophysical strain. Second, in this study, the constructs of interest were measures using the same method, that is, self-report questionnaires. Although the temporal separation between the measures of the predictor and criterion variables should reduce concerns about common method bias [84], future research could include objective measures of psychophysical strain (e.g., biomarkers of WRS) or observer ratings of JDs and JRs [85–89] to further support the validity of the proposed associations [90]. Furthermore, it should be noted that the longitudinal association between

PRIW/communication and psychophysical strain was rather weak, and the predictors accounted for only a small proportion of variance in the dependent variable [91]. A possible explanation may relate to the time in which data collection occurred. The choice of a four-month time lag is in line with previous empirical research and is based on the premise that stressful situations at work may substantially reduce or lose their impact on individuals' health and well-being if the time lag is too long [92–95]. However, the two data collections overlapped with two distinct phases of the pandemic in Italy: the second wave and the third wave, respectively [52]. In this perspective, a weak association is understandable, given that PRIW/communication during the second wave may have had a somewhat reduced salience in predicting psychophysical strain during the third wave. Clearly, the evolution of a pandemic is unpredictable, but future studies could use shorter time lags to investigate in more detail the relationships over time between PRIW/communication and psychophysical strain. Lastly, different circumstances across waves, such as, for example, the arrival of vaccines, could have affected COVID-19 risk and risk perception. However, we believe that this should not be a major concern in this study, which was aimed at testing a specific, theory-driven hypothesis, namely, whether PRIW predicts a change in psychological/physical symptoms associated with work-related stress over time. Accordingly, we measured PRIW at a single time point, that is, between the end of October 2020 and the first half of November 2020 (i.e., T1, before the arrival of the vaccines). Furthermore, we measured psychophysical strain at both T1 and T2 (i.e., between the end of February 2021 and the first half of March 2021) to capture the relative change in strain over time (i.e., unidirectional model) [33]. Clearly, the association between vaccines and COVID-19 risk/perceived risk is likely to be complex. For example, it is possible that a wide diffusion of vaccines could be associated with a lower perception of risk, but differences in risk perceptions across countries and cultures [23] could also affect the diffusion of vaccines. However, the exploration of the complex interrelationships between vaccine diffusion and COVID-19 risk and risk perception is beyond the aim of this study, but could be thoroughly investigated in future research.

Finally, we believe that our study has several practical implications for organizations and practitioners. More specifically, we suggest that effective interventions to reduce or manage PRIW should target both the organization and individuals in terms of primary and secondary prevention, respectively. First, with respect to primary prevention, this study suggests that PRIW should be considered a supplementary JD for workers. Moreover, previous research has shown that job-related risks are associated with higher levels of workload for employees, who need to carry out supplementary tasks to handle risky situations [82]. Accordingly, organizations should recognize that individuals need to invest additional psychophysical energies in their work (e.g., to manage the risk of infection) and adjust working conditions accordingly, for example, by providing employees with adequate time and resources (e.g., safety devices, sufficient space for interpersonal distancing, decision-making processes that prioritize safety at work) to achieve their work goals safely. Second, organizations should promote an adequate balance between JDs and JRs. In this perspective, organizations should encourage the exchange of good-quality information and feedback about COVID-19 risks among team members. This may help workers to achieve their work objectives safely and foster their perceived efficacy in managing the risk of infection. Finally, it should also be considered that PRIW can be reduced but likely cannot be completely eliminated. Hence, in terms of secondary prevention, interventions could help workers, especially those with high levels of personal demands (PDs), to more effectively handle the risk of COVID-19 infection at work. In the framework of the JD-R model, PDs are those "aspects of the self that force individuals to invest disproportionate effort in their work and/or hamper them to successfully cope with their environment and are therefore associated with psychological and/or physical costs" (p.3) [96]. For example, recent research by Girardi et al. [97] showed that the relationship between PRIW and psychophysical strain was stronger for individuals with high levels of negative affectivity (NA)—a mood-dispositional dimension that "reflects pervasive individual differences in negative emotionality and self-concept" (p.465) [98]—probably

because NA is related to reduced coping abilities [99]. At this level, organizations may then help workers with high levels of PDs, including NA, to develop or strengthen the skills needed to cope effectively with the risk of infection at work, such as problem- and meaning-focused coping strategies [25].

5. Conclusions

This study showed that PRIW with COVID-19, conceived of as a JD, positively predicted psychophysical strain four months later, whereas communication as a JR negatively predicted psychophysical strain over time. All in all, this study emphasized the relevance of an adequate balance between JDs (e.g., PRIW) and JRs (e.g., communication) related to COVID-19 to promote more sustainable working conditions, aimed at fostering employees' health and well-being during the ongoing pandemic.

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