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Original article

Coronavirus Disease (COVID-19) Pandemic: The Psychological Well-Being in a Cohort of Workers of a Multinational Company

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ABSTRACT

Background: The aim of the present study was to evaluate the psychological well-being (PWB) during the coronavirus disease (COVID-19) pandemic in workers of a multinational company.**Methods:** Employees (aged ≥ 18 years) were recruited from Latin American, North American, New Zealand, and European sites of a multinational company operative during all the pandemic period. The self-reported Psychological General Well-Being Index was used to assess the global PWB and the effects on six subdomains: anxiety, depressed mood, positive well-being, self-control, general health, and vitality. The influencing role of age, gender, geographical location, COVID-19 epidemiology, and restrictive measures adopted to control the pandemic was explored.**Results:** A total of 1335 workers completed the survey. The aggregate median PWB global score was in a positive range, with significantly better outcomes detected in the Mexican and Colombian Latin American sites compared with the other worldwide countries ($p < 0.001$). Among the European locations, a significantly higher PWB score was determined in Spain compared with the German and French sites ($p < 0.05$). Comparable geographical trends were demonstrated for all the PWB subdomains. Male workers had a significantly better PWB compared with females ($p < 0.05$), whereas a negative correlation emerged with aging ($p = 0.01$). COVID-19 epidemiology and pandemic control measures had no clear effects on PWB.**Conclusion:** Monitoring PWB and the impact of individual and pandemic-related variables may be helpful to clarify the mental health effects of pandemic, define targeted psychological-supporting measures, also in the workplace, to face such a complex situation in a more constructive way.© 2021 Occupational Safety and Health Research Institute, Published by Elsevier Korea LLC. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

The ongoing pandemic of coronavirus disease (COVID-19) represents a unique stressful event affecting not only the physical health but also the psychological well-being (PWB) of individuals and communities [1]. The fear of falling ill or dying as well as the public health policies adopted to control the pandemic, that is, lockdown measures, displacement reduction, social distancing, together with financial insecurity and uncertainties on the future, characterize major stressful events [2].

In this view, emerging evidence pointed out high levels of distress, anxiety, and depression as the effects of the pandemic on the mental health of the general population [3,4]. Despite such increasing evidence, several issues remain to be fully understood particularly as concerns the possible role of demographic characteristics, that is, age and gender, personality traits, sociocultural backgrounds, sector of employment, and pandemic-related features, in mediating the psychological response of individuals [5,6].

Therefore, the aim of this study was to evaluate the subjective perception of PWB in a cohort of workers engaged in different

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Table 1

Absolute frequencies and percentages of the employees who participated to the study in each country and demographic data of the sample by site

Variable	US	Colombia	Chile	Mexico	Germany	France	Spain	New Zealand	Total
Participants, n (%)	88 (59)	85 (83)	230 (92)	261 (52)	153 (61)	153 (59)	332 (79)	33 (100)	1335 (68)
Sex									
F, n (%)	14 (21)	27 (32)	31 (15)	53 (21)	95 (71)	18 (16)	52 (18)	27 (82)	317 (27)
M, n (%)	52 (79)	58 (68)	174 (85)	197 (79)	39 (29)	97 (84)	243 (82)	6 (18)	866 (73)
Missing	22	0	25	11	19	38	37	0	152
Age, mean (SD)	40 (11)	44 (9)	38 (11)	35 (9)	40 (12)	39 (9)	41 (9)	47 (12)	39 (10)
Missing	34	1	74	8	26	39	54	0	236

Data are presented as frequency (percentage) for the categorical variables number of participants and sex. Mean (SD) have been used for the continuous variable age. Frequency of missing data is also reported.

worldwide plants of the same multinational company and not subjected to workplace lockdown measures due to the essentiality of their job activities, as well as intra- and inter-continental differences in PWB related to the demographic, geographic, and COVID-19 epidemiological features. This may be important to identify individuals or groups of individuals prone to psychological disorders, with the aim to define supportive interventions to promote wellness and coping in occupational and general living settings that could be integrated into the general pandemic health care, social, and economic management.

2. Materials and methods

2.1. Participants and study design

A cross-sectional study was conducted from August 10, 2020, to September 20, 2020. Adults (aged ≥ 18 years) employed in skilled-unskilled manual duties in a multinational company engaged in the manufacture of home and personal hygiene products, operating in plants located in different worldwide countries, were recruited. In all the sites, employees shared the same job organization and the same preventive and protective measures to contain the risk from COVID-19. As the company deals with essential non-healthcare services, no restrictions at the productive activities have been applied according to the outbreak of the COVID-19 pandemic. In Europe, three sites located in Germany, France, and Spain were investigated. Three studied plants were located in Latin America, in Colombia, Chile, and Mexico. A single plant has been studied, respectively, in New Zealand and in Kentucky (the United States). Participants were clarified on the aims and procedures of the study. Informed consent was requested before starting the survey. Personal information was not collected to protect confidentiality. The study protocol was approved by the Ethics Committee of the University of Naples Federico II (ref. no. 278/20). Epidemiological data on COVID-19 in countries, regions, and sites, as well as public health restrictive measures locally adopted to control the pandemic, have also been collected (Supplementary 1 and 2).

2.2. Measurement of PWB

PWB was assessed through the Psychological General Well-Being Index (PGWBI) [7]. Different language-validated versions of the questionnaire were used for the various countries [8]. The PGWBI is a 22-item self-reported questionnaire aimed to measure the subjective well-being or discomfort referred to the last 4 weeks of the lifetime of the individual [9]. The PGWBI items explore six different dimensions: anxiety, depressed mood, positive well-being, self-control, general health, and vitality. A 6-point Likert scale (from 0 to 5) provides subscale and total scoring, including all the dimensions that can reach a maximum of 110 points [9]. Higher scores indicate better PWB. The final score was calculated by dividing the raw score obtained on the test by the maximum raw

score obtainable for each dimension and multiplying the result by 100. Global scores ≤ 54 points reflect severe distress, between 55 and 65 reflect moderate distress, and between 66 and 100 reflect a positive PWB or "no distress" categories.

2.3. Statistical analysis

Continuous variables are described with median and interquartile range and with mean and standard deviation (SD). Categorical variables are presented as raw frequency and percentage. Mean comparisons of continuous variables between groups are computed with Student's *t*-test or Mann-Whitney U test as appropriate for two groups, and with analysis of variance or Kruskal-Wallis test as appropriate for three or more groups. Correlation between continuous variables is analyzed using Pearson's *r* coefficient or Spearman's rho coefficient as appropriate. Multilevel analysis to investigate the effect of country-level and individual-level variables on PGWBI scores is conducted using mixed-effect linear regression models. For all analyses, a *p* value < 0.05 was considered statistically significant. Analyses were performed using the statistical software R, version 4.0.3.

3. Results

3.1. Participant characteristics

Of the 1962 workers who were invited to participate (102, 250, and 500 from the Colombian, Chilean, and Mexican sites; 33 and 149 from the New Zealand and US plants; and 250, 260, and 418 from the German, French, and Spanish, respectively; Supplementary 1), 1335 respondents completed the survey (68%). When this latter parameter was assessed in each site, the greatest study participation was reported by the New Zealand workers (33, 100%), followed by the employees engaged in the Chilean (230, 92%), Colombian (85, 83%), and Spanish plants (332, 79%), respectively. Workers from the remaining sites showed a lower 52–61% of participation with 88, 261, 153, and 153 subjects enrolled in the United States, Mexican, French, and German locations, respectively (Table 1). Of the total sample, 866 participants (73%) were males, and this trend was maintained at individual sites where more than half of the recruited participants were males, with the exception of Germany and New Zealand. The mean age \pm SD was 39 ± 10 years and was comparable between the cohorts from different countries (Table 1).

3.2. PWB perception: global score

The median total score of the overall sample was 76, corresponding to a generally positive PWB (Table 2, Supplementary 3). The median values in individual sites were also in the positive range, although with some significant geographical differences (Table 3; Supplementary 4). A better appreciation was determined in the Latin American sites compared with all the other worldwide countries. This was demonstrated by the significantly higher

Table 2
Median scores for the global PWB and each domain in the total investigated sample and in female and male subgroups

Variable	Total, n = 1335	Female, n = 317		Male, n = 866		p value (F vs. M)	Age	
	Median (IQR)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)		Correlation	p value
Anxiety	76 (60, 88)	72 (64, 84)	71 (18)	76 (60, 88)	73 (20)	0.005*	−0.033	0.274
Depression	87 (73, 100)	87 (73, 93)	83 (16)	93 (80, 100)	86 (17)	<0.001*	−0.078	0.010*
Positive well-being	65 (50, 80)	65 (50, 75)	63 (18)	70 (55, 80)	66 (19)	0.004*	−0.129	<0.001*
Self-control	87 (73, 93)	87 (73, 93)	81 (17)	87 (73, 98)	83 (18)	0.002*	−0.054	0.075
General Health	80 (67, 87)	80 (67, 87)	74 (18)	80 (67, 93)	77 (18)	0.003*	−0.145	<0.001*
Vitality	70 (55, 80)	65 (55, 80)	64 (21)	70 (55, 85)	69 (20)	<0.001*	−0.003	0.932
Global	76 (64, 85)	74 (64, 82)	72 (16)	78 (65, 87)	75 (16)	<0.001*	−0.078	0.010*

Age correlation with the global PWB and individual domain.

Data are presented as median (IQR range) and mean (SD). p values are computed with Mann-Whitney U test. Significant values are marked with asterisks. Correlation coefficients and p values are computed with Spearman's rho test. Significant values are marked with asterisks.

median levels determined in the Mexican (84) and Colombian (82) plants than those of the European, the United States, and New Zealand sites ($p < 0.001$). However, the significantly lower Chilean score compared with the Mexican and Colombian ones ($p < 0.001$) support a possible role of local factors in determining the well-being appreciation. The same considerations can explain the significantly lower median levels found in Germany and France compared with Spain ($p < 0.05$).

3.3. PWB perception: subdomains

In line with the global PWB perception, also in the analysis of the anxiety and the depression items, the median aggregate scores, 76 and 87, respectively, suggested that the overall investigated population was in a not-distressed condition regarding such domains (Supplementary 3). Moreover, when the median scores for each site were evaluated, significantly higher levels were determined in the Colombian and Mexican sites compared with the other worldwide plants ($p < 0.05$; Supplementary 4). This suggested significantly lower levels of anxiety and depression in these specific groups of Latin American workers compared with the others, also when an intracontinental analysis was performed in relation to their Chilean colleagues ($p < 0.001$). The highest perception of anxiety was determined in the US workers (64). Concerning the European scenario, significantly better outcomes were obtained in the Spanish site compared with the German and French ones ($p < 0.05$) and comparable, in the case of the depression score, to those of the Colombian site ($p = 0.072$). In line with anxiety and depression, the general median scores for other domains, such as those exploring the ability to self-control, the perception of being in a general good health, and the appreciation of one's own vitality, resulted in a positive range. More critical situations emerged for the positive well-being item in which all the groups showed lower median scores, with the worst outcome

found in the New Zealand site (55). In addition, the previously mentioned geographical trends recurred in all these items, with workers from the Colombia and Mexico having the best psychological outcomes worldwide ($p < 0.05$). In Europe, the Spanish cohort has been confirmed to have the highest scores in all the items investigated ($p < 0.05$), whereas German workers showed the most critical situations, particularly as concerns the low perception of vitality.

3.4. Demographic variables and PWB

Regarding the impact of gender on PWB, both female and male workers showed a global positive perception, although with significantly better outcomes in the latter ones ($p < 0.001$). Comparable significant differences were observed within each subscale ($p < 0.001$; Table 2). When the gender impact on PWB was explored in each individual site, no significant sex-related differences could be found in all but two plants, the Mexican and New Zealand ones. In fact, significantly higher mean levels \pm SD were determined in male Mexican (83.76 ± 12.31) and New Zealand employees (76.06 ± 10.41), compared with female workers of the same plants who showed scores of 78.36 ± 9.03 and 65.66 ± 13.04 , respectively ($p < 0.005$; Table 4).

To assess the possible influencing role of age, workers were stratified into three different aged groups: (18–30], (30–50], and (50–68] years (Table 5). The mean levels of PWB were generally in a middle distress or positive range, and an age-dependent decrease, although not significant, could be detected in almost all sites. The only exception was represented by the Spanish site ($p = 0.016$), with significant differences between age groups (18–30] and (30–50] years, who showed mean values \pm SD of 79.25 ± 14.09 and 73.53 ± 15.69 ($p = 0.030$), respectively, as well as (18–30] and (50–68] years, this latter group having a mean score of 70.70 ± 12.23 ($p = 0.005$). Moreover, the significant negative correlation found

Table 3
Median scores for the global PWB and individual domains in each site

Variable	US, n = 88	Colombia, n = 85	Chile, n = 230	Mexico, n = 261	Germany, n = 153	France, n = 153	Spain, n = 332	New Zealand, n = 33	p value
Anxiety	64 (47, 80)	84 (72, 92)	72 (56, 84)	84 (72, 92)	68 (52, 80)	72 (52, 84)	76 (60, 88)	68 (56, 80)	<0.001*
Depression	87 (73, 100)	93 (80, 100)	87 (73, 98)	93 (87, 100)	80 (67, 93)	87 (67, 93)	93 (80, 100)	80 (67, 87)	<0.001*
Positive well-being	60 (44, 76)	70 (65, 85)	65 (55, 80)	75 (65, 87)	60 (40, 70)	65 (50, 75)	65 (50, 75)	55 (50, 70)	<0.001*
Self-control	87 (67, 93)	93 (87, 100)	87 (73, 93)	93 (80, 100)	80 (67, 90)	80 (60, 93)	87 (73, 93)	73 (67, 87)	<0.001*
General health	73 (60, 82)	80 (67, 93)	73 (60, 87)	87 (80, 93)	73 (60, 87)	73 (60, 87)	80 (67, 93)	73 (67, 80)	<0.001*
Vitality	65 (40, 75)	80 (70, 85)	65 (55, 80)	80 (70, 90)	55 (40, 70)	65 (50, 80)	70 (55, 80)	65 (55, 75)	<0.001*
Global	71 (56, 83)	82 (75, 90)	74 (62, 84)	84 (75, 92)	69 (53, 78)	73 (55, 83)	76 (65, 85)	71 (59, 77)	<0.001*

Data are presented as median (IQR range). p values are computed with Kruskal-Wallis test. Significant values are marked with asterisks.

Table 4
Gender-related mean scores for the global PWB in each site

Country	Gender	Mean (global score)	SD (global score)	p value
US	F	66,83	21,17	0.875
US	M	66,32	17,95	
Colombia	F	76,72	13,09	0.051
Colombia	M	82,37	11,69	
Chile	F	73,70	12,17	0.638
Chile	M	71,87	15,25	
Mexico	F	78,36	9,03	<0.001*
Mexico	M	83,76	12,31	
Germany	F	66,23	18,00	0.870
Germany	M	66,51	13,50	
France	F	75,66	11,04	0.207
France	M	67,75	20,89	
Spain	F	73,50	15,59	0.694
Spain	M	74,01	15,37	
New Zealand	F	65,66	13,04	0.033*
New Zealand	M	76,06	10,41	

Data are presented as mean \pm standard deviation. *p* values are computed with Student's *t*-test or Mann-Whitney U test as appropriate. Significant values are marked with asterisks.

between age and the subscale scores for depressed mood, positive well-being, general health, and the global well-being index supported aging as a predictive factor for worst psychological outcomes (Table 2).

3.5. COVID-19-related variables and PWB

When the impact of the epidemiological situation of positive COVID-19 cases on the PWB was assessed, a significant direct association was found between the rate of positive cases per 100,000 inhabitants in the region and higher scores in the depressed mood ($p = 0.043$) and self-control ($p = 0.040$) dimensions. This was

Table 5
Age-related mean scores for the global PWB in each site

Country	Age	Mean (global score)	SD (global score)	p value
US	(18,30]	65,58	17,31	0.575
US	(30,50]	70,14	17,48	
US	(50,68]	64,00	20,29	
Colombia	(18,30]	87,50	11,32	0.158
Colombia	(30,50]	79,68	12,74	
Colombia	(50,68]	80,59	11,69	
Chile	(18,30]	72,21	15,74	0.362
Chile	(30,50]	72,38	14,63	
Chile	(50,68]	77,36	13,15	
Mexico	(18,30]	82,20	10,61	0.240
Mexico	(30,50]	82,97	12,48	
Mexico	(50,68]	77,90	13,98	
Germany	(18,30]	68,73	14,10	0.527
Germany	(30,50]	65,67	16,13	
Germany	(50,68]	63,79	20,85	
France	(18,30]	71,86	18,27	0.655
France	(30,50]	69,02	20,62	
France	(50,68]	65,00	21,55	
Spain	(18,30]	79,25	14,09	0.016*
Spain	(30,50]	73,53	15,69	
Spain	(50,68]	70,70	14,67	
New Zealand	(18,30]	70,76	12,23	0.758
New Zealand	(30,50]	67,64	11,68	
New Zealand	(50,68]	66,36	14,66	

Data are presented as mean \pm standard deviation. *p* values are computed with one-way analysis of variance or Kruskal-Wallis test as appropriate. Significant values are marked with asterisks.

indicative for a decrease in depression and an increase in the self-control according to the growing number of cases (Table 6). Comparably, the increasing number of suspected cases within the site was positively related to the general health dimension score ($p = 0.022$) (Table 6). Interestingly, despite the regions where the Mexican and the Colombian sites were located suffered from the highest number of positive cases per 100,000 inhabitants (Supplementary 1), 413 and 563, respectively, the employees of these plants showed the highest median scores in all the domains. Conversely, the New Zealand and German locations with 5 and 74 cases per 100,000 inhabitants in their regions, respectively, demonstrated the worst outcomes in multiple domains with respect to the Latin American countries (Table 3). As regards the effect of the restrictive measures applied to prevent infections during the study period, only the closure of the schools showed a significant correlation with increasing scores in the depressed mood, positive well-being, and self-control items, as well as in the global well-being (Table 6; Supplementary 2).

4. Discussion

This study represents the first attempt to provide a cross-national comparison of PWB perception of non-healthcare workers, employed in different worldwide plants of the same multinational company with the aim to point out the influencing role of individual and epidemiological-related risk factors. Despite the critical period experienced, the general levels of PWB were in a positive range both when the analysis was performed on all the workforce, as well as when different sites were individually considered. These results can be partly explained by the psychological benefits to retain a job during such pandemic, against the negative impact induced by the employment uncertainty, income loss, or experience of wage reduction due to short-time working [10]. Working during the pandemic may support the individual perception to be able to cope with stressful situations, thus preventing psychological disorders [11]. In addition, to work outside the healthcare sector, thus not experiencing the fear to be infected while caring for COVID-19 patients and not facing suffering and deaths every day, as well as to be not engaged in home working, avoiding the stress-full balance between work and home needs and social loneliness, could result in a lower level of psychological distress [10,12].

The general positive results obtained in our cohort of manual workers seem in contrast with the idea that a lower job level could predict a lower subjective well-being [13]. However, the lack of detailed information on the specific tasks performed by the enrolled workers (necessary to ensure the anonymity of the participants) and the absence of a comparison with groups engaged in more skilled and managerial positions prevented an adequate interpretation of our findings. The mediating role of different educational levels, socioeconomic status, and company responsibilities in forward the production, while ensuring the health and safety of the employees, should be deeply elucidated.

With regard to the geographical differences, our results demonstrated better outcomes in Latin American and Southern European workers. This can suggest that PWB can be influenced by cultural variations. The collectivistic culture of Hispanics, compared with the individualistic one of Western Europe and North American, which emphasizes the needs and goals of the group over those of the individual, would characterize a stronger support in alleviating the negative psychological consequences of the pandemic [14]. In addition, also the geographical differences in personality traits, which may be affected by social, genetic, and ecological influences, may encourage more resilient traits [15,16]. Geographical distribution of personality showed that Asian countries scored

Table 6

Correlation between global PWB and epidemiology of COVID-19 and lockdown measures applied in the study period. Significant values are marked with asterisks.

	Anxiety		Depression		Positive well-being		Self-control		General health		Vitality		Global	
	Est.	p value	Est.	p value	Est.	p value	Est.	p value	Est.	p value	Est.	p value	Est.	p value
Epidemiology of COVID-19														
Rate per 100,000 (country)	0.01	0.526	0.01	0.229	0.01	0.528	0.01	0.185	<0.01	0.601	0.01	0.413	0.01	0.392
Rate per 100,000 (region)	0.01	0.261	0.02	0.043*	0.01	0.220	0.02	0.040*	0.01	0.165	0.02	0.230	0.02	0.147
N° of confirmed cases on the site	2.14	0.233	1.94	0.130	1.29	0.457	2.40	0.117	1.73	0.181	2.83	0.204	2.08	0.199
N° of suspected cases on the site	0.12	0.141	0.09	0.109	0.12	0.095	0.09	0.199	0.12	0.022*	0.13	0.212	0.11	0.114
Lockdown measures														
Schools closure		0.083		0.021*		0.022*		0.019*		0.274		0.092		0.050*
No	Ref.		Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
Partially	2.12		5.81		2.20		6.62		4.11		3.44		3.79	
Yes	11.43		9.95		11.79		11.97		7.08		14.34		11.37	
Not essential shops closed		0.147		0.168		0.308		0.083		0.537		0.266		0.199
No	Ref.		Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
Partially	7.06		5.78		5.03		6.72		4.18		5.61		5.82	
Yes	14.93		10.32		11.88		14.55		6.05		17.16		12.91	
Mass gatherings events banned		0.482		0.475		0.594		0.516		0.772		0.656		0.594
No	Ref.		Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
Partially	-2.80		4.85		2.05		6.02		-0.04		-5.63		0.18	
Yes	6.03		7.76		7.14		8.86		3.52		3.87		6.12	
National movement banned		0.519		0.297		0.666		0.256		0.641		0.506		0.492
No	Ref.		Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
Partially	2.99		6.04		5.64		6.67		1.92		-0.08		3.67	
Yes	9.40		10.70		8.43		13.00		5.84		9.09		9.37	
Local movement banned		0.147		0.168		0.308		0.083		0.537		0.266		0.199
No	Ref.		Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
Partially	7.06		5.78		5.03		6.72		4.18		5.61		5.82	
Yes	14.93		10.32		11.88		14.55		6.05		17.16		12.91	
Mandatory use of mask		0.732		0.532		0.519		0.558		0.597		0.800		0.694
No	Ref.		Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
Partially	7.51		8.00		9.89		7.94		6.03		6.27		7.62	
Yes	3.72		7.10		5.03		8.68		1.81		1.02		4.35	

lower on extraversion, higher levels for openness were reported for the Central and South American nations, whereas neuroticism was higher in the Southern and Eastern European nations compared with the Western ones [16]. These personality traits correlate with well-being: conscientiousness with life satisfaction; extraversion and neuroticism with positive and negative affect, respectively [1,17]. However, further research, aimed to address inter- and intra-continental differences, appears necessary to understand whether personality traits could explain PWB geographical variability. Moreover, our data do not allow to understand the impact that cultural variations may have on PWB with respect to geographical-related social security level and the social position held by enrolled workers. Additional studies are necessary to clarify these aspects and provide a better interpretation of our findings.

However, it cannot be excluded that a possible “healthy worker effect” or a selection bias could have affected our results. In some cases, the participation rate was slightly higher than the half of the total working populations and could be responsible for the inclusion of the most motivated workers, with a better PWB perception, or conversely, of those more willing to claim critical issues in their condition. This may provide a figure not adequately representative of the real PWB perception of the target population and need to be explored on an implemented sample size. Other individual factors, that is, coronavirus infection, having been in contact with a suspected or confirmed case, caring for sick people in household, or country-specific social and economic issues, that is, employment rate, insecure employment, and resulting poverty, that could have affected the obtained results, should be investigated as possible predictors of PWB perception.

The better outcomes obtained by men in comparison with women support the importance of a gender-based PWB analysis. Female gender, in fact, was reported as a predictive factor for

posttraumatic stress disorder symptoms, as well as anxiety and depression after pandemics [17,18]. Moreover, compared with men, women may have experienced a greater need for balancing work activities with routine housework and childcare, amplified by school closure or homeschooling, resulting in greater effects on PWB [19]. Moreover, although a different social women’s status could be supposed between various countries, that could influence women’s stress for economic loss, childcare, and household matters, the absence of significant gender-related differences in the global PWB perception in each country, with the exception of Mexico and New Zealand, can suggest that other factors, including those mentioned before, could play a more impacting role. However, the impact of such gender-related differences on the various aspects and dynamics of the PWB needs deeper understanding.

In relation to the age-related effects, no clear trends could be pointed out, as only one site showed a significant decrease in PWB with respect to aging. Although mixed evidence is available concerning the PWB in different aged groups, lower levels in the elderly may be related to the physical health and cognitive decline in later life, as well as to the fear, perceived threat, and distress due to the higher risk for a severe COVID-19 [5,20]. However, although inconclusive, our results support the relevance to not neglect age as a possible influencing factor in affecting PWB during the COVID-19 outbreak.

The potentially threatening COVID-19 experiences resulted in more distal predictors for a decrease in PWB, as a no clear relationship emerged between pandemic parameters, at the national, regional, or occupational site level and worst outcomes in all the investigated domains. Conversely, the number of positive cases within the region or suspected cases within the workplace were significantly related to higher self-control and lower depression levels, as well as to a better perception of the general health,

respectively. This may be argued to be related to a better perception of the one's health in comparison to other worst conditions "outside." However, it cannot be excluded that some aspects of the COVID-19 pandemic, that is, the stigma and social avoidance for being infected, or the positive influence of having tests negative for COVID-19, could have been somewhat undervalued. Also, the role of the measures adopted to control the pandemic outbreak remains to be fully clarified. Among different restrictions analyzed, only the school closure had a positive impact on PWB, in terms of better outcomes in depression, positive well-being, self-control, and global well-being perception. Overall, although still preliminary and in a general positive range, the findings derived from this pilot analysis point out a specific psychological profile for different occupational populations. These issues may be important to plan targeted supportive interventions, including psychological education or cognitive behavioral techniques, that may be specifically tailored to the identified predictive factors for worst outcomes.

The strengths of the study include its large size and worldwide perspective, the examination of employees who are not in the health care, and the evaluation of both personal and epidemiological factors that may affect PWB. Some limitations include the collection of data through a self-administered survey that may be affected by recall bias and inaccurate self-reporting and the cross-sectional nature of our investigation that prevents to understand possible PWB changes due to the COVID-19 pandemic with respect to the previous periods. In addition, the lack of PWB data from other groups of healthy residents/workers in the investigated countries and of "reference PWB values" for the general population in these countries prevent to understand the impact that an intrinsically higher/lower PWB perception because of economical rewards and welfare during employment may have on the interpretation of the retrieved results. In this view, longitudinal studies under different pandemic waves, as well as when all the restrictions will definitively end, should be planned to define the direction of the previously mentioned effects and the possible long-term impact of COVID-19.

5. Discussion

Future research should more deeply explore the influencing role of personal life issues, including marital status, family composition, place of living, level of education, past mental stress or medical problems, socioeconomic status, and coping strategies on PWB perception. More information on the work tasks, length of employment, work-related stress, and occupational support should be collected to understand the role of "work-life" interactions in affecting PWB. The impact of different psychosocial predictors, including distress and loneliness as well as empathic and coping abilities, should be elucidated. The viewpoint of infected people, which may represent a vulnerable population, also considering the possible long-term effects of COVID-19 and the patients' need to return to work after the infection, should be addressed. Despite the COVID-19 pandemic undoubtedly poses risks for mental health, this can increase social cohesion and connections for handling difficulties in different settings, including the workplace [21]. Therefore, future investigations should be aimed to identify factors that can promote resilience in the face of the COVID-19 pandemic, that is, family processes, organization, sense of community, and broader social connectedness as well as global work functioning. Overall, this may allow to define targeted psychological-supporting measures that can help individuals to achieve their physical, mental, and social well-being. This may be important to enhance individual awareness of the emergency, build resilience, and increase social responsibility, thus facing such a complex situation in a more constructive way.

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Conflicts of interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.shaw.2021.10.006>.

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