

Original Research

COVID-19 exposure and mental wellbeing of European male employees

Faisal Mahmood¹, Antonio Ariza-Montes^{2,*}, Maria Saleem³, Heesup Han^{4,*}¹The University of Faisalabad, 38000 Punjab, Pakistan²Universidad Loyola Andalucía, 14004 Córdoba, Spain³The University of Lahore, 54590 Lahore, Pakistan⁴College of Hospitality and Tourism Management, Sejong University, 05006 Seoul, Republic of Korea*Correspondence: heesup.han@gmail.com (Heesup Han); ariza@uloyola.es (Antonio Ariza-Montes)

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Abstract

Background: The present research intends to identify the determinants of men's mental wellbeing during the COVID-19 pandemic. The fear and uncertainty caused by this pandemic and its prolongation have caused a considerable rise in mental health disorders. In a very short time, much research has been conducted examining the main consequences of the COVID-19 pandemic on individuals' mental health. Some studies pointed out that COVID-19 stressors significantly affect individuals, and some statistics suggest that the pandemic affects men and women differently. However, the literature on the effect of the COVID-19 pandemic on men's mental health remains limited. This research attempted to fill these gaps in the literature by examining an essential research question about the determinants of men's mental wellbeing during the COVID-19 pandemic. **Methods:** This research uses a dataset collected on Eurofound's Living, Working, and COVID-19 survey, and the full sample consisted of 24,123 European citizens. The sample was split into two main groups: men (N = 3577) and women (N = 8744). This research uses linear regression methodology to investigate the mental wellbeing of male employees. The input method was applied to estimate two regression models, one for men and one for women. **Results:** Our results revealed that men's exposure to COVID-19 infection deteriorates their mental wellbeing. Similarly, some organizational factors also determined men's mental wellbeing, such as working under fixed employment contracts, feelings of doing useful work, and satisfaction with the quality of work. Finally, individual and attitudinal factors contributed to determining the mental wellbeing of male employees, optimism about the future, general health, positive feelings about themselves, and overall life satisfaction. **Conclusion:** This research deduces that men's mental wellbeing is determined by factors that are different from those of women employees. In conclusion, this research deduces that men's good mental wellbeing is determined differently from women employees. Specifically, we identified that exposure to COVID-19, employment contracts at the job, feelings of doing useful work, satisfaction with the quality of work, resilience, age, life satisfaction, general health, optimism about the future, and feeling positive about themselves are the key determinants of men's health.

Keywords: men's mental wellbeing; COVID-19 pandemic; eurofound's living; organizational factors; individual and attitudinal factors

1. Introduction

The COVID-19 pandemic that has ravaged the planet since the beginning of 2020 has had harmful effects on the mental health of individuals. The fear and uncertainty caused by the COVID-19 pandemic and its prolongation over time have caused a considerable rise in mental health disorders, for example, a high level of depression and anxiety. The interest in the field of men's mental health has drastically increased [1]. Some authors highlighted that men usually express their problems linked with depression and anxiety, increasing risk-taking, anger, and alcohol use in contrast to women [2,3]. In Western Europe, the majority of cases of contagion and mortality were men (52 to 58 percent, with a death rate of approximately 70 percent) compared to women [4]. It is also noted that the chances of developing severe COVID-19 diseases are higher in men (6% of the male population at risk globally) than in women (3% of the female population at risk worldwide) [5].

Although some authors, such as Gebhard [6], pointed out that COVID-19 stressors significantly affect men, most

of the existing literature does not adopt a gender approach. However, some statistics reported higher mortality and morbidity in men than in women [7,8]. Without a doubt, it is still unclear and not completely identified how men respond to the current pandemic, so there is an enormous need to investigate men's mental health during COVID-19 [9]. This research intends to fill these gaps in the existing literature by examining an essential research question: what are the determinants of men's mental wellbeing during the COVID-19 pandemic?

Specifically, the objectives of this research are manifold. For instance, this research intends to uncover the determinants of European men's mental wellbeing in exposure to COVID-19. Similarly, this study also examines the effect of the availability of resources for men to confront the virus along with their trust in the health care system to determine their mental wellbeing. In addition, some organizational, individual, and attitudinal factors as antecedents of men's mental wellbeing are considered and contrasted with the effect of these factors on women's mental wellbeing in



this research for better comprehension. Most of the existing literature discussed the effects of some of these factors for the whole sample rather than splitting the sample into male and female groups.

Recent literature has noted various effects of COVID-19 on employees, such as changes in working conditions, wellbeing, and psychological disorders such as anxiety, stress, and depression [10,11]. Mental wellbeing is referred to as a state without any mental illness [12], attaining the state that is beyond happiness [13], thriving and flourishing in harsh periods [14], feeling pleasure and contentment [15], and a state where an individual can live to his extremes [16]. Undoubtedly, individuals' quality of life improves due to health, happiness, and calmness at work [17]. However, according to Krok [18], the possibility of getting the virus is higher in workplaces, leading to psychological illnesses with a negative impact on workers' mental wellbeing. These circumstances were even more serious in the first months of the COVID-19 pandemic due to a lack of personal protection equipment, such as gloves and masks. Some researchers have focused their projects on investigating employees' psychological health, such as the positive association of personal protection equipment availability with mental healthiness [19], how direct exposure to COVID-19 in the workplace derives to anxiety and depression [20], that some workers did not feel safe even though personal protection equipment was available to them [21], or that low trust in the health care system also created depression in the workers [22]. In addition, existing studies have noted that COVID-19 stressors significantly influence men's psychological health [9], and mental health is distinctively affected by COVID-19 in men and women [23]. This study underpins the Rogers [24] protection motivation theory, which explains individuals' defence against health vulnerability. This is an extensively utilized framework to comprehend individuals' reactions to a possible danger [25]. Individuals react, and they take defending actions or avoid activities that may harm them or other individuals. In addition, this theory postulates that individuals assess possible reactions to the threat through possibility and intensity of the threat, as well as the concern for the efficacy of the reaction. By taking insights from this theory and in line with individuals' risk perceptions and adoption of protective behaviours, and as per the research objectives this research assumes that male employees' exposure to COVID-19, lack of resources such as scarcity of personal protection equipment, and distrust in the health care system may worsen their mental wellbeing.

In addition to these COVID-19 related factors, many organizational factors may affect the wellbeing of male employees. For example, job insecurities due to the COVID-19 pandemic have significantly influenced men's mental health [26]; continuing one's job, either at the workplace or from home using teleworking, can protect psychological wellbeing [9]. It has also been noted that extreme job de-

mands and psychological stress in the workplace increase workers' mental health issues [27,28]. To further demonstrate the importance of organizational factors to determine the mental wellbeing of employees, this research takes insights from self-determination theory by Deci [29]. Self-determination theory contends that the accomplishments of fundamental requirements are indispensable to attain several work-related consequences, for example, work satisfaction, wellbeing, or health issues. The underlying theory also shows that the context or conditions in which employees perform activities determine their behaviour [15]. Self-determination theory is a common concept in the field of psychology and has been extensively applied in various other fields or subjects, i.e., work, education, and health. The underlying concept of self-determination refers to individuals' capacity to manage their lives and to make choices. This ability of individuals is essential for psychological wellbeing and health. The self-determination view permits individuals or persons to sense that they have control over their lives and choices and that they feel much motivated. Likewise, self-determination theory concentrates on individuals' motivation and highlights the importance of internal resources, such as sensibilities or capacities. These resources can help the personal development of workers and meet the challenges posed by the social context. For example, Di Domenico [29] highlighted the positive link of need satisfaction, physical health, and wellbeing. Self-determination theory is employed in this research according to the objectives of this research as to when employees feel motivated to perform their tasks or duties then this may improve their mental wellbeing. In contrast, other organizational factors, such as enlarged workload, job insecurity, or tight working times, may worsen the mental wellbeing of employees. Similarly, Richter [30] and Holland [31] noted that job insecurity and high workload are adversely associated with the mental wellbeing of employees. Likewise, there is little social support [32], and no relations at work with others [33].

Furthermore, different attitudinal and individual factors can determine men's mental wellbeing as well. For instance, age, life satisfaction, resilience, general health, or the level of education. Studies such as Huang [34] found a positive link between the resilience and good mental wellbeing of employees as they feel calm, relaxed, and energetic. Moreover, employees who are optimistic about the future usually exhibit better mental well-being [35], both optimism and resilience predict high mental well-being [36]. While unintentionally extended working times are inversely related to high mental well-being in men [37].

Finally, in contrast to men and women employees'. Men have more suicidal thoughts than women who have more lifetime occurrences of anxiety and mood disorders [38]. Further, in men, mental health problems are commonly linked to inflexibility to cope styles to confront various dominating male roles [39]. Women in China and Italy

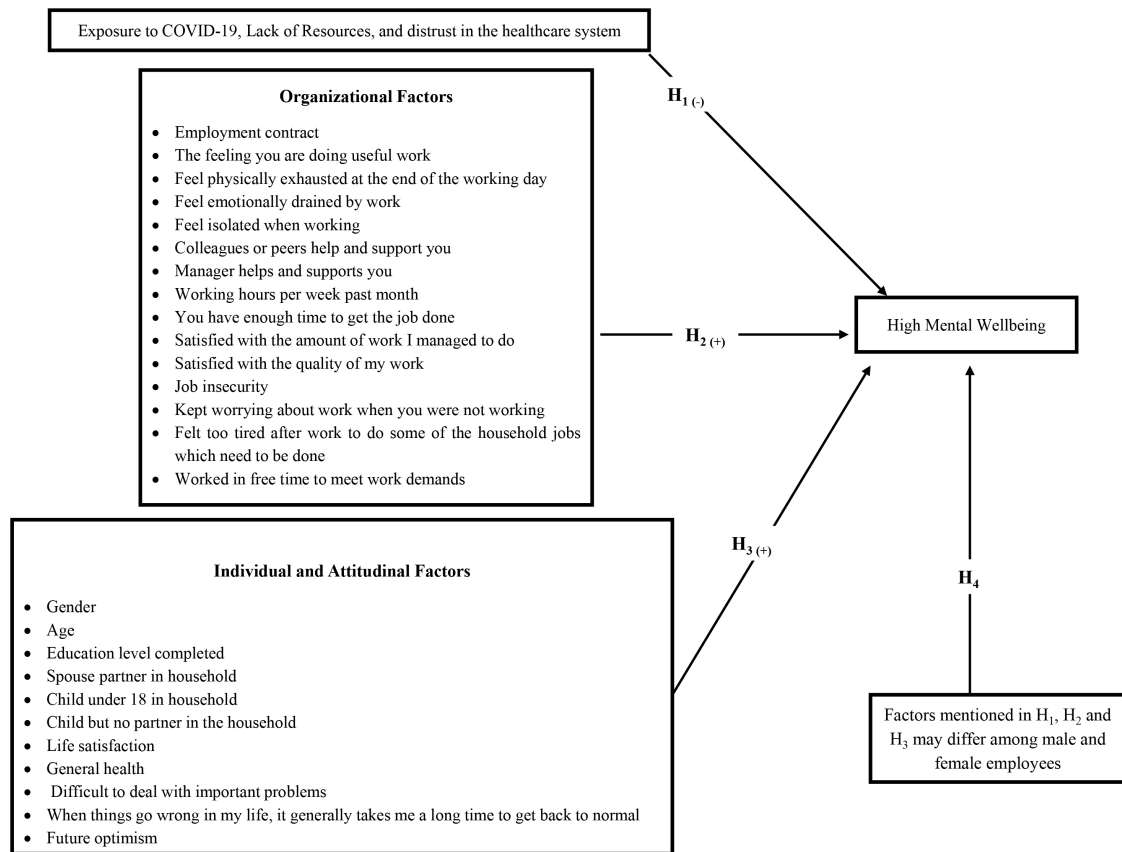


Fig. 1. The proposed model.

have reported more psychological distress, anxiety, and stress than men during the COVID-19 pandemic [40]. In addition, increased mental distress was noted in the women living with children in the UK since the COVID-19 crisis started [41].

In the light of the above-documented literature, this study expects that the determinants of men’s mental wellbeing are different from women’s mental wellbeing. For instance, life satisfaction, general health, future optimism, and resilience may differ in these two groups.

2. Methods

2.1 Research model and hypotheses

The research model derived from the theoretical background is shown in the following figure.

Fig. 1 graphically displays the theoretical model of this research.

Such a research model is reflected in the following hypotheses:

Hypothesis 1: COVID-19 exposure, lack of resources to confront coronavirus, and lack of trust in the health care system are negatively associated with the high mental wellbeing of men workers.

Hypothesis 2: Organizational factors (i.e., low workload, more time to complete a job and more social support,

job security) increase the mental wellbeing of men employees.

Hypothesis 3: Some individual and attitudinal factors (gender, age, optimism, and resilience) are positively linked to the mental wellbeing of men.

Hypothesis 4: The factors that determine high mental wellbeing are different in male and female employees.

2.2 Data collection and sample profile

This research uses the dataset collected on Eurofound’s Living, Working, and COVID-19 survey [42]. Data are public and available and thus there is no need of ethical approvals and consent to participate in this study. Three rounds of this unique survey have been carried out to date: Round 1: Launched on 9 April 2020 when most Member States were in their first lockdown; Round 2: June-July 2020 when economies and societies were gradually reopening; Round 3: March 2021, almost a year on, as countries were still dealing with various levels of lockdown. Although Eurofound’s survey also includes a panel component, whereby the evolution of the same respondent can be tracked over time, unfortunately, to date, panel data are not yet available to researchers. When information becomes available, longitudinal studies can be developed about the mental health evolution of European people from the beginning of the COVID-19 pandemic to the present.

Table 1. Explanatory variables of wellbeing.

	Variables
Exposure to COVID-19 and Resources to Affront it	At risk of COVID-19 because of job (0: No; 1: Yes)
	Physical contact with people at work: from 1 (never) to 5 (always)
	Change in amount of work done during COVID-19 pandemic: from 1 (decreased a lot) to 5 (increased a lot)
	Informed about COVID-19 prevention measures: from 1 (very well informed) to 4 (not at all informed)
	Required to wear PPE to prevent COVID-19 (0: No; 1: Yes)
	Employer provides PPE (0: Yes, most of the time or sometimes; 1: No)
	Trust in the health care system: from 1 (trust completely) to 10 (do not trust at all)
Organizational	Employment contract in main job (0: limited; 1: unlimited)
	You have the feeling you are doing useful work: from 1 (always) to 5 (never)
	You feel physically exhausted at the end of the working day: from 1 (never) to 5 (always)
	You feel emotionally drained by work: from 1 (never) to 5 (always)
	You feel isolated when working: from 1 (never) to 5 (always)
	Your colleagues or peers help and support you: from 1 (always) to 5 (never)
	Your manager helps and supports you: from 1 (always) to 5 (never)
	Working hours per week past month
	You have enough time to get the job done: from 1 (always) to 5 (never)
	I am satisfied with the amount of work I managed to do: from 1 (strongly agree) to 5 (strongly disagree)
	I am satisfied with the quality of my work: from 1 (strongly agree) to 5 (strongly disagree)
	Job insecurity (might lose your job in the next 3 months): 0: No, neither/very/rather unlikely; 1: Yes, very or rather likely)
	Kept worrying about work when you were not working: from 1 (never) to 5 (always)
	Felt too tired after work to do some of the household jobs which need to be done: from 1 (never) to 5 (always)
Worked in free time to meet work demands: from 1 (never) to 5 (every day)	
Individual and attitudinal	Gender (0: Male; 1: Female)
	Age (18–77 year)
	Education level completed (0: Primary; 1: Secondary; 2: Tertiary)
	Spouse/Partner in household (0: No; 1: Yes)
	Child under 18 in household (0: No; 1: Yes)
	Child but no partner in the household (0: No; 1: Yes)
	Life satisfaction: from 1 (very satisfied) to 10 (very dissatisfied)
	General health (0: Very good; 1: Good; 2: Fair; 3: Bad; 4: Very bad)
	Resilience 1: I find it difficult to deal with important problems that come up in my life: from 1 (strongly disagree) to 5 (strongly agree)
	Resilience 2: When things go wrong in my life, it generally takes me a long time to get back to normal: from 1 (strongly disagree) to 5 (strongly agree)
	I am optimistic about my future: from 1 (strongly agree) to 5 (strongly disagree)
In general, I feel very positive about myself: from 1 (strongly agree) to 5 (strongly disagree)	

For this reason, the present investigation was performed with a subsample of the 2nd round, which analyses the social and economic implications of the COVID-19 pandemic across Europe and the influence on living and working conditions. The data of this survey were collected by the European Foundation for the Improvement of Living and Working Conditions (Eurofound), a tripartite European Union Agency established in 1975. For data protection reasons, the survey was open to people aged 18 or over, and a General Data Protection Regulation note was made available to the respondents. Data are available free of charge for research and non-commercial use. Since our research uses this secondary source of data, we were not required for ethics approval.

The fieldwork was performed in 27 EU countries with an uncontrolled convenience sample. The full sample consisted of 24,123 European citizens. The sample was split into two main groups: men and women. Furthermore, given that exposure to COVID-19 may have an important occupational component, it was also decided to select only those employed at the time of the survey. The fieldwork for this second round took place between June and July 2020, just after coming out of several months of strict confinement to try to contain the COVID-19 pandemic, harsh and unexpected confinement that, overnight, changed the lives of the world's population, which has undoubtedly impacted the mental health of citizens. Considering these criteria, the overall sample was reduced to a total of 12321 employees, 3577 of whom were men (29%) and 8744 of whom were women (71%).

2.3 Measurement tools

This research uses the World Health Organization Five Well-being Index (WHO-5) to measure men's mental well-being. Different studies have demonstrated that the WHO-5 presents high reliability and robust psychometric properties (e.g., Lara-Cabrera [43] or Sischa [44]). This research obtained a Cronbach's α of 0.889. The five items of this questionnaire are the following: (1) I have felt cheerful in good spirits; (2) I have felt calm and relaxed; (3) I have felt active and vigorous; (4) I woke up feeling fresh and rested; (5) My daily life has been filled with things that interest me. A six-point Likert scale ranging from 0 = "at no time" to 6 = "all of the time" was administered among employees. Multiplying the raw score by four, a score ranging from 0 to 100 was obtained, in which 100 represents the best men's mental well-being. On a scale of 0–100, the well-being of male employees is 56.8, with 100 points being the highest degree of well-being. This result is higher than that of female employees, whose score is 53.5.

The independent variables of this research were extracted from the Eurofound Living, Working, and COVID-19 survey. These variables were grouped into three categories, as shown in Table 1.

2.4 Data analysis

This research uses linear regression methodology to investigate the mental well-being of male employees. The input method was applied to estimate two regression models, one for men and one for women. The models analyse which COVID-19 variables, organizational factors, and personal-attitudinal variables contribute to explaining the well-being of both groups, examining which variables are common between the groups and which present a different profile. The analysis is performed in IBM SPSS Statistics 24. In addition, the sector and socioeconomic status of the participants are the control variables for this research. This research also ensured the absence of heteroskedasticity issue by employing the Breusch [45] test. The Chi-square (Chi^2) value was 0.03, and the Prob. $> \text{Chi}^2$ was found to be 0.291 which is above the threshold level of 0.05. Thus, homoscedasticity was ensured as the alternative hypothesis of heteroskedasticity was rejected. Further, Variance Inflation Factor (VIF) for the absence of multicollinearity was also tested, and the results are reported after.

3. Results

Table 2 provides some sociodemographic factors that serve to characterize the sample.

Unfortunately, Eurofound's Living, Working, and COVID-19 survey does not identify the main job occupation of the respondent. For merely illustrative purposes, Table 3 shows the well-being of employees by sector of activity for both men and women. This table shows that industries with the worst mental well-being among men are agriculture, commerce-hospitality, and transport, while women with the worst mental well-being work in financial services, commerce-hospitality, and transport. The table also reveals that the well-being of women is lower than that of men in all sectors of activity (in the case of financial services, the gap is more than 8 points), except in agriculture, where women have their best result (60.5), a value that is 9 points higher than that obtained for men (51.4). These differences are also found to be statistically significant by employing the independent sample *t* test. The null hypothesis of this test is rejected, as the differences between male and female employees' mental well-being are statistically significant.

Table 4 reported the test for multicollinearity and the multiple regression analysis. The VIF showed no problem of multicollinearity as the values are below the threshold level of 4 as specified by Pan [46]. Table 4 also shows that the well-being of male employees is conditioned by a unique variable related to the COVID-19 pandemic category, such as having the feeling of being at risk of infection by COVID-19 because of the job performed, which reduces the well-being of male employees ($\beta = -2.476$; $p = 0.031$). None of the other factors related to COVID-19 exposure, the resources available to combat it, or trust in the health care system contribute to the well-being of male European employees. In contrast, Table 4 also displays the results for

Table 2. Sociodemographic variables.

Variables	% (Male employees)	% (Female employees)
Age group		
(a) 18–34 years	21.7%	15.7%
(b) 35–49 years	35.3%	38.9%
(c) 50+ years	43.0%	45.4%
Spouse or partner in household		
(a) Yes	70.5%	65.4%
(b) No	29.5%	34.5%
Children living at home		
(a) Yes	45.0%	46.9%
(b) No	55.0%	53.1%
Education level completed		
(a) Tertiary	69.2%	75.6%
(b) Secondary	28.0%	22.8%
(c) Primary	2.8%	1.6%
Employment contract in the main job		
(a) Contract of unlimited duration	84.9%	84.2%
(b) Contract of limited duration	11.9%	13.0%
(c) Others	2.8%	3.2%
General health		
(a) Very good	21.1%	18.3%
(b) Good	50.5%	50.0%
(c) Fair	24.4%	27.6%
(d) Bad	3.7%	3.7%
(e) Very bad	0.3%	0.3%

Table 3. Wellbeing by sector and gender.

	Male employees		Female employees		Significance	
	Mean	SD	Mean	SD	<i>t</i> value	<i>p</i> value
Agriculture	51.4	18.4	60.5	19.2	3.21	0.001
Industry	55.8	20.0	53.4	20.9	2.01	0.044
Construction	59.9	19.6	53.7	20.9	2.42	0.015
Commerce and hospitality	52.5	20.9	50.8	21.4	1.98	0.047
Transport	54.6	21.9	51.1	20.6	2.89	0.003
Financial services	58.4	19.8	50.1	20.0	4.56	0.000
Public administration	58.6	18.5	54.3	19.6	3.99	0.000
Education	59.3	19.5	57.0	19.8	1.99	0.046
Health	58.7	20.0	53.3	20.2	4.77	0.000

female employees, showing that no variable associated with COVID-19 affects women's wellbeing. This fact is interesting given that some of the sectors of activity most exposed to the coronavirus show a high degree of feminization, as is the case of nursing professionals. Future studies should analyse whether this is due to a higher degree of resilience among women or because, on the whole, their degree of COVID-19 exposure was lower than that of men.

Concerning the variables of an organizational nature, Table 4 shows that the work environment also contributes to the mental health of male employees, such that their well-

being increases when they work under a fixed employment contract ($\beta = 3.367$; $p = 0.05$), if the work does not interfere with the household jobs which need to be done after work ($\beta = 3.314$; $p < 0.001$), if they are not emotionally drained by work ($\beta = 2.584$; $p < 0.001$), if male employees have the feeling they are doing useful work ($\beta = 1.618$; $p = 0.02$) and last, if they are satisfied with the quality of their work ($\beta = 1.592$; $p = 0.04$). As seen in Table 4, there is little overlap with the variables that determine the wellbeing of female employees. Some reflections on this are as follows: (1) Six organizational variables influence the wellbeing of

Table 4. Male and female linear regression models for WHO-5.

Factors	Male							Female						
	VIF	β	SE	<i>t</i>	Upper 95% CI	Lower 95% CI	Sig.	β	SE	<i>t</i>	Upper 95% CI	Lower 95% CI	Sig.	
Exposure to COVID-19 and Resources to Affront it	Constant		-37.96	14.74	-2.57	-66.92	-8.99	0.01	-57.03	8.38	-6.80	-73.48	-40.58	0.00
	At risk of COVID-19 because of job	1.09	-2.47	1.14	-2.17	-4.72	-0.23	0.03	0.20	0.79	0.26	-1.34	1.75	0.79
	Physical contact with people at work	1.18	-0.19	0.44	-0.44	-1.05	0.65	0.66	0.25	0.29	0.86	-0.32	0.82	0.39
	Change in amount of work done during COVID-19 pandemic	2.03	-0.75	0.48	-1.55	-1.70	0.20	0.12	0.38	0.31	1.25	-0.22	0.99	0.21
	Informed about COVID-19 prevention measures	3.00	1.08	0.99	1.09	-0.87	3.06	0.27	1.07	0.62	1.70	-0.16	2.30	0.08
	Required to wear PPE to prevent COVID-19	1.01	-12.53	12.27	-1.02	-36.62	11.51	0.30	-2.05	6.6	-0.31	-15.04	10.92	0.75
	Employer provides PPE	2.20	-0.22	1.68	-0.13	-3.52	3.08	0.89	0.76	0.94	0.78	-1.16	2.69	0.43
	Trust in the health care system	3.01	-0.14	0.24	-0.59	-0.63	0.33	0.55	-0.05	0.10	-0.34	-0.39	0.27	0.73
Organizational	Employment contract in main job	1.10	3.36	1.74	1.93	-0.05	6.78	0.05	-1.46	1.00	-1.46	-3.42	0.50	0.14
	You have the feeling you are doing useful work	1.44	1.61	0.71	2.27	0.21	3.02	0.02	2.46	0.49	4.99	1.49	3.43	0.00
	You feel physically exhausted at the end of the working day	1.09	-0.00	0.76	-0.01	-1.50	1.49	0.99	1.00	0.51	1.94	-0.01	2.02	0.05
	You feel emotionally drained by work)	2.03	2.58	0.71	3.63	1.18	3.98	0.00	1.95	0.50	3.86	0.96	2.94	0.00
	You feel isolated when working	1.90	0.71	0.60	1.19	-0.46	1.89	0.23	0.58	0.39	1.48	-0.19	1.35	0.14
	Your colleagues or peers help and support you	2.35	0.24	0.71	0.34	-1.15	1.64	0.73	1.26	0.45	2.75	0.35	2.16	0.00
	Your manager helps and supports you	3.10	0.22	0.58	0.38	-0.92	1.37	0.70	-0.63	0.39	-1.62	-1.40	0.13	0.10
	Working hours per week past month	0.78	-0.01	0.03	-0.33	-0.06	0.04	0.73	-0.00	0.02	-0.23	-0.04	0.03	0.81
	You have enough time to get the job done	1.41	0.23	0.61	0.39	-0.96	1.44	0.69	0.14	0.43	0.34	-0.70	0.99	0.73
	I am satisfied with the amount of work I managed to do	1.32	1.12	0.71	1.56	-0.28	2.53	0.11	0.29	0.46	0.64	-0.61	1.21	0.52
	I am satisfied with the quality of my work	1.99	1.59	0.77	2.06	0.07	3.11	0.04	0.45	0.52	0.86	-0.58	1.48	0.38
	Job insecurity (might lose your job in the next 3 months)	2.11	-1.21	2.04	-0.59	-5.23	2.80	0.55	2.19	1.45	1.50	-0.66	5.05	0.13
	Kept worrying about work when you were not working	1.11	0.85	0.56	1.51	-0.26	1.97	0.13	0.97	0.38	2.54	0.22	1.72	0.01
	Felt too tired after work to do some of the household jobs	0.98	3.31	0.71	4.66	1.91	4.71	0.00	2.76	0.50	5.52	1.78	3.74	0.00
Worked in free time to meet work demands	2.25	-0.52	0.50	-1.03	-1.51	0.47	0.30	0.78	0.31	2.47	0.16	1.40	0.01	
Individual and attitudinal	Age (18–77 year)	1.21	0.14	0.05	2.90	0.04	0.24	0.00	0.11	0.03	3.22	0.04	0.19	0.00
	Education level completed	1.41	-1.13	1.21	-0.93	-3.51	1.25	0.35	0.47	1.04	0.46	-1.56	2.51	0.64
	Spouse/Partner in household	1.11	-2.68	1.45	-1.84	-5.54	0.18	0.06	-0.94	0.87	-1.08	-2.63	0.77	0.28
	Child under 18 in household	1.42	2.18	1.24	1.76	-0.25	4.62	0.07	0.85	0.89	0.96	-0.84	2.59	0.33
	Child but no partner in the household	1.01	-8.27	4.23	-1.95	-16.55	0.05	0.05	-0.78	1.86	-0.43	-4.47	2.86	0.66
	Life satisfaction	2.54	1.01	0.40	2.53	0.22	1.81	0.01	2.87	0.25	11.43	2.37	3.36	0.00
	General health	2.87	4.79	0.78	6.14	3.26	6.33	0.00	4.05	0.50	8.01	3.05	5.04	0.00
	Resilience 1:	2.11	0.71	0.73	0.97	-0.73	2.16	0.33	2.58	0.46	5.58	1.67	3.49	0.00
	Resilience 2:	1.65	2.01	0.71	2.83	0.61	3.41	0.00	0.60	0.46	1.30	-0.30	1.52	0.19
	I am optimistic about my future	1.42	4.43	0.72	6.12	3.01	5.86	0.00	1.57	0.47	3.30	0.64	2.51	0.00
	In general, I feel very positive about myself	2.79	3.27	0.75	4.33	1.79	4.76	0.00	3.92	0.51	7.68	2.92	4.92	0.00
		R²					0.599					0.580		
Control variable	Socioeconomic status	1.72	1.54	1.45	1.12	-0.12	3.18	0.26	1.02	0.99	1.03	-0.01	2.03	0.31
	R²					0.602					0.582			

female employees; (2) Only three of these variables are present in both groups: not feel too tired after work to do the household jobs which need to be done ($\beta = 2.762$; $p < 0.001$), the feeling of doing useful work ($\beta = 2.465$; $p < 0.001$) and not feel emotionally drained by work ($\beta = 1.953$; $p < 0.001$) and (3) Three other variables are present exclusively in the female employees' model: having the help and support of colleagues or peers ($\beta = 1.260$; $p < 0.001$), not kept worrying about work when they were not working ($\beta = 0.974$; $p = 0.01$) and not having to work in free time to meet work demands ($\beta = 0.784$; $p = 0.01$).

Finally, personal and attitudinal variables also have a decisive influence on the wellbeing of male employees: general health ($\beta = 4.799$; $p < 0.001$), optimism about their future ($\beta = 4.438$; $p < 0.001$), feeling very positive about themselves ($\beta = 3.276$; $p < 0.001$), resilience to get soon back to normal when things go wrong in life ($\beta = 2.018$; $p < 0.001$) and, to a lesser extent, wellbeing increases with age ($\beta = 0.148$; $p < 0.001$) and overall life satisfaction ($\beta = 1.018$; $p = 0.01$). In this category of variables, the overlap between the male and female models is closer (see Table 4). First, 5 of the 6 variables identified for men also influence women's wellbeing. Second, the only variable that does not emerge in the female model is resilience, understood as the capacity to recover normality in the face of problems that arise during life ($\beta = 0.609$; $p = 0.19$). However, it is positively influenced by the other type of resilience analysed, which is understood as the facility to deal with important problems that come up in life ($\beta = 2.585$; $p < 0.001$). Finally, concerning the five overlapping variables, it should be noted that two of them have more weight in women than in men (positive about themselves, $\beta = 3.92$; $p < 0.001$; and life satisfaction, $\beta = 2.87$; $p < 0.001$), while three others have less influence on women compared to men: general health ($\beta = 4.05$; $p < 0.001$); optimism about the future ($\beta = 1.579$; $p < 0.001$) and age ($\beta = 0.119$; $p < 0.001$).

4. Discussion

The present research investigates the determinants of men's mental wellbeing during the COVID-19 pandemic by imperatively considering men's exposure to COVID-19, the availability of resources, and trust in the health care system. In addition, other organizational, individual and attitudinal factors are also investigated to establish men's mental wellbeing. Using a European sample of 3577 male employees and 8744 female employees, and before conducting the hypothesis testing, an independent sample *t* test was employed to test the differences between the mental wellbeing of male and female employees. Accordingly, the results reported significant gender differences. Concerning hypothesis testing, it was found that men's exposure to COVID-19 infection (i.e., feelings of being at risk of COVID-19) deteriorates their mental wellbeing. In Hypothesis 1, it was stated that COVID-19 exposure, lack of resources to confront coronavirus, and lack of trust in the health care sys-

tem are negatively associated with the high mental wellbeing of men workers. Accordingly, it is found that exposure to COVID-19 is negatively associated with men's mental wellbeing. Therefore, Hypothesis 1 is supported concerning COVID-19 exposure and men's mental wellbeing. Our findings are consistent with other studies that have noticed adverse effects of exposure to COVID-19 on employee mental wellbeing. For instance, Tuzovic [47] emphasized the adverse effect on the mental wellbeing of employees during COVID-19. Similarly, Sim [48] notes that the COVID-19 crisis challenges the employees or professions of almost every sector and industry. More intensely to those who are directly exposed to the virus (e.g., health care professionals who are directly confronting the COVID-19 pandemic and exhibit a high infection risk as they are dealing with infected individuals) and the workers of other sectors and industries, due to swift changes in common work practices, for example, having to work at home from one day to the next. Likewise, the adverse effect of exposure to COVID-19 on employees' psychological disorders and wellbeing is also documented by Krok [18] and Schwartz [11]. All these authors confirmed that the possibility of encountering the coronavirus negatively influenced workers' mental wellbeing. Likewise, Jacques-Aviñó [23] found different effects of COVID-19 on men's and women's mental health.

Interestingly, we did not find any effect of resource availability to confront the virus or trust in the health care system on the mental wellbeing of men, and a similar effect was also noted for women. This fact is curious since previous literature has confirmed the positive link between certain resources (e.g., availability of personal protection equipment) and good mental health [19]. In this sense, Faderani [21] discovered that employees did not feel safe even when protective equipment was available. Additionally, Marković [22] pointed out that low trust in the health care system has adversely affected mental health among Serbian skilled workers. Therefore, concerning the lack of resources to confront coronavirus and lack of trust in the health care system, as hypothesized in Hypothesis 1, are not supported.

In addition, we found that some organizational factors also determined men's mental wellbeing, such as working under fixed employment contracts, feelings of doing useful work, and satisfaction with work quality. These findings are consistent with the existing literature. For instance, White [26] demonstrated the adverse effect of job insecurity on men's good mental health and a considerable rise in the suicide rate in men. In addition, Santos *et al.* [9] pointed out the positive effect of job continuity on psychological wellbeing. Similarly, Parslow [28] found a negative impact of increased job demands on employee mental health. Furthermore, men's mental health is more influenced in the time of crisis than women's [29], and increased feelings of doing useful work are positively associated with employees'

mental health, while a shortage of time to complete a job, workload and job insecurity are adversely related to good mental health [30,31]. In the opposite direction, emotional exhaustion at work, low social support, and no communication with others at the job perish employees' mental health [32,33,49].

Concerning the effect of organizational factors on the good mental wellbeing of women, we found that peer support, scarcity of time to accomplish work tasks, and not keeping worrying about work when they were not working influenced the mental wellbeing of female employees. Hypothesis 2 stated that organizational factors (i.e., low workload, more time to complete a job, more social support, job security) increase the mental wellbeing of male employees. Accordingly, it is found that there are only three factors common to men and women: not feeling too tired after work to do the household jobs, feeling of doing useful work, and not feeling emotionally drained by work. However, regarding other factors, such as exposure to COVID-19, resources to confront the virus and trust in the health care system were not significantly related to women employees' wellbeing. Thus, it can be concluded that men's mental wellbeing is more determined by COVID-19-related factors than organizational determinants, as few factors are relevant to their mental health in contrast to women. Therefore, Hypothesis 2 is partially supported, as fewer factors are found to determine men's mental wellbeing than others.

Hypothesis 3 states that some individual and attitudinal factors (gender, age, optimism, and resilience) are positively linked to the mental wellbeing of men. Accordingly, individual and attitudinal factors contributed to determining the mental wellbeing of male employees. For example, optimism about the future, general health, feeling positive about themselves, overall life satisfaction, or resilience to get back soon to normal when things go wrong in life. This is consistent with the existing literature that noted identical effects such as a positive association of resilience with good mental health [34]; less effect of work-related burnout and stress was noted on the mental wellbeing of men than the women [50]; male employees reported more satisfaction with their jobs in comparison to female [51]; domestic burdens and having children worsened the mental wellbeing of women compared to men [52]; or that optimism to face the future leads to greater mental wellbeing [35]. Similarly, using a sample of college students from the Philippines, Miranda [36] discovered a strong relationship between good mental wellbeing and resilience and optimism.

Hypothesis 4 suggested that the factors that determine high mental wellbeing are different in male and female employees. Thus, concerning the differences in individual and attitudinal determinants of good mental wellbeing, most factors were identified in men and women, such as future optimism, positivity about themselves, general health, and life satisfaction. Resilience (the capacity to recover normality in the face of problems that arise during life) de-

termines good mental wellbeing in men. In contrast, other types of resilience (the facility to deal with important problems that come up in life) determine good mental wellbeing in women.

5. Conclusions

In conclusion, this research deduces that men's good mental wellbeing is determined differently than it is for women employees. Specifically, we identified that exposure to COVID-19, employment contracts at the job, feelings of doing useful work, satisfaction with the quality of work, resilience, age, life satisfaction, general health, optimism about the future, and feeling positive about themselves are the key determinants of men's health.

The present study offers many theoretical and practical implications. Theoretically, it advances the current knowledge domain cornering the determinants of men's good mental wellbeing during the COVID-19 pandemic. Several organizational, attitudinal, and personal factors have been identified and proven to significantly influence men's mental wellbeing in the European context. In addition, the underpinning of the protection motivation theory of Rogers [24] to explain the impact of the COVID-19 pandemic on working males' mental wellbeing further extends the theoretical implications of this research. In summary, theoretically, we extended the five knowledge domains, including literature on mental wellbeing and particularly working men's mental wellbeing; the COVID-19 pandemic and its effect on employees; organizational determinants of males' mental wellbeing; individual and attitudinal factors as the antecedents of mental wellbeing; and comparisons of both men and women working in various industries concerning the determinants of their mental wellbeing.

Additionally, the findings of this research offer various practical insights. The findings of this study suggest that interventions should be concentrated on the monitoring, prevention, and treatment of depression and anxiety, all oriented to promote men's psychological wellbeing. Moreover, as per our results, the determinants of mental wellbeing vary across male and female employees and are not similarly affected by the COVID-19 pandemic. For men, the scarcity of personal protection equipment and distrust in health care are not found to be significant determinants of their mental wellbeing. Hence, practitioners must consider that providing personal protection equipment will not add anything to good men's mental wellbeing. Instead, exposure to COVID-19 is the key influential factor that must be considered, and such a working environment or policies must be designed that can minimize exposure to COVID-19.

Therefore, the mental wellbeing of these two groups must be separately evaluated and valued. Moreover, men's mental wellbeing is influenced by exposure to COVID-19 and by several organizational, individual, and attitudinal factors that play an essential role. Therefore, organizational

practitioners and decision-makers should consider the conclusions derived from this research. First, the management policies to be implemented must necessarily adopt a gender approach that discriminates between men and women. Second, companies must design and finance training plans aimed at educating their employees to confront pandemics and other uncertainties in this world so dynamically. Finally, human resource managers must adopt a preventive policy to address the COVID-19 pandemic and anticipate future crises. Thus, the current need is vigilant planning to obtain helpful measures in lieu for those who are the utmost vulnerable.

6. Limitations and future directions

Like all studies in the social sciences, this research presents some limitations that should be highlighted. For example, our investigation used a cross-sectional design, so the causality conclusions must be interpreted with caution. It is also complex to overcome the limitations of using self-report questionnaires, even more so in a subject as sensitive as the infection of a virus. This circumstance can cause biases in the respondents' answers. Another limitation of this research is that our sample is over representative of women. As indicated by Guo [53], e-surveys can be an efficient way of recruiting large numbers of participants, but there is potential for bias. The overrepresentation of women in our sample may be because men tend to participate less in this type of voluntary survey. Due to the limitation in the representativeness of the sample, we must be cautious when generalizing the findings to the entire population. More studies are warranted to investigate and overcome this gender limitation. In addition, the data in this study come from Europe, mainly from the countries that make up the European Union. This circumstance introduces limitations to extrapolate the results. We strongly suggest that future research verifies whether the findings obtained are valid in other regions of the planet with cultural, social, and economic contexts different from Europe.

Author contributions

Conception, Design of the study—AAM and HH. Literature review—FM and MS. Writing—FM, MS, AAM and HH. Funding acquisition, supervision—AAM and HH.

Ethics approval and consent to participate

Not applicable.

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Conflict of interest

The authors declare no conflict of interest. AAM and HH are serving as one of the Guest editors of this journal. We declare that AAM and HH had no involvement in the peer review of this article and has no access to information regarding its peer review. Full responsibility for the editorial process for this article was delegated to AO.

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