

## BRIEF REPORT

# Does working at home compromise mental health? A study on European mature adults in COVID times

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## Abstract

**Introduction:** The COVID-19 pandemic has transformed working at home (WAH) into the exclusive mode of working for many European workers. Although WAH will likely remain after COVID-19, its consequences on workers' health are unclear. This study examines the association of WAH and the change of four mental health (MH) domains.

**Methods:** We used data from the last wave of the Survey on Health, Aging, and Retirement in Europe, collected in June and July 2020 on European people aged 50 and older. We restricted our analysis to people aged 50–65 who were working before COVID-19 ( $N = 7065$ ). We modeled the risk of worsening of depression and anxiety feelings, sleeping trouble, and feelings of loneliness as a function of the working situation (usual setting, at home and usual setting, at home only), using logistic regressions. A first model adjusted for sociodemographic variables, a second one adding country fixed effects, and the last one adding the stringency of COVID-19-related restrictions.

**Results:** WAH was significantly associated with a worsening of all MH symptoms. Nevertheless, when the stringency index was factored in, no significant association of WAH was found with any of the health outcomes except for anxiety feelings (+4.3% points). However, the increased anxiety feelings among people in WAH were not greater than the one observed among nonworkers.

**Discussion:** Our findings show that WAH was not a major cause of mental health deterioration among European mature adults during the first month of the pandemic. Further evidence is needed on WAH under post-COVID-19 “normal” circumstances.

## KEYWORDS

COVID-19, Europe, mental health, teleworking, working at home

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## 1 | INTRODUCTION

The current pandemic of COVID-19 has led authorities of all European countries to impose severe social distancing measures in order to decrease infections and hospitalizations and to avoid deaths. The fight against the COVID-19 pandemic has included, especially, the closing of workplaces, with working at home (WAH) transformed from a marginal practice (fewer than 1 in 20 workers) into the exclusive mode of working for 34% of workers in Europe.<sup>1</sup> The current pandemic may last for years so that restrictions may remain in the long run, at least during certain periods of the year and particularly for high-risk groups, thereby maintaining the WAH practice. At the same time, firms and workers have noticed the advantages of WAH, supported by further digitalization and advanced communication technologies, opening the way for the expansion of WAH beyond the pandemic.

In regard to long-term opportunities, based on a survey of occupations' activities, a paper published in September 2020 estimated that 37% of jobs in the USA could be performed from home, reaching more than 40% in Sweden and Denmark.<sup>2</sup> The Eurofound e-survey carried out in July 2020 showed, also, that 78% of workers would be willing to work from home at least occasionally even without COVID-19 restrictions.<sup>1</sup>

Concerning economic benefits, a study in Germany showed that firms relying on WAH were less likely to ask for public wage subsidies and to face adverse effects of the crisis while contributing to lower COVID-19 transmission.<sup>3</sup> A randomized experiment in a call center in China showed a 13% increase in performance among WAH employees.<sup>4</sup> A survey carried out in several waves in 2020 in the USA observed that 41% of the respondents reported being more efficient when working from home, whereas only 15% reported the contrary.<sup>5</sup> This survey also detailed why, beyond the potential productivity increase, WAH is likely to increase; in particular, the stigma associated with WAH decreased, the WAH experience during the COVID-19 pandemic was better than expected, a large investment in WAH equipment and infrastructure (with high fixed costs) has already been achieved, and many people may feel a reluctance to return to prepandemic activities.

Nevertheless, concerns were raised about the potential downside of WAH on health. In particular, negative effects were expected related to the reduced socialization with colleagues, limited support from institutions, extended working hours, increased sedentarism, and long hours of screen time, as well as the disruption of work–life boundaries, the blurring of which could threaten mental detachment from work.<sup>6</sup> A recent study based on a survey observed a drop in physical and mental well-being,

more pronounced among women and low-income persons, related to changes in physical activity and eating habits.<sup>6</sup> However, these negative findings were possibly biased by the confounding effect of COVID-related social restrictions. A rapid review of 23 studies, most carried out before the pandemic, obtained inconclusive results, due to the paucity of studies regarding the impact of WAH on physical health, and contradictory findings pertaining to mental health.<sup>7</sup> The lack of research in this area has also been highlighted recently.<sup>8</sup>

There are strong indications that WAH will remain after the pandemic, with potential benefits for firms, but its consequences on workers' health remain unclear. This study examines the association of WAH and the deterioration of four mental health domains, using a representative sample of working European mature adults.

## 2 | METHODS

### 2.1 | Data

We used data from the wave 8/Corona Survey of the Survey on Health, Aging, and Retirement in Europe (SHARE) carried out in June and July 2020 on European persons aged 50 and older ( $n = 45\,033$ ).<sup>9</sup> The SHARE is based on representative samples of the population from each participating country, that is, individuals above 50 were randomly selected using two- or three-stage sampling (depending on the country), with a selection of localities and persons based on local registries, followed by verifying age-related eligibility. The survey was performed by experienced interviewers, who received specific training. More information on the survey design and methods can be found at ([http://www.share-project.org/fileadmin/pdf\\_documentation/Methodology/Methodology\\_2005.pdf](http://www.share-project.org/fileadmin/pdf_documentation/Methodology/Methodology_2005.pdf)). We restricted our analysis to individuals aged between 50 and 65 years old (32 356 observations excluded) who were working before the pandemic (“Employed or self-employed when COVID-19 broke out”) (5612 observations excluded). People older than 65 were excluded because 65 years old corresponds to the statutory retirement age in most European countries and the usual threshold used in occupational research and official reports<sup>10</sup> to define the upper limit of the active population. Workers beyond this age were not likely to be representative of the workers' universe due to their more privileged condition,<sup>11</sup> so that including employees above 65 would prone the research to the healthy worker bias.

The restriction to a specific age group eliminated indeed the representativity of our sample. Yet, our objective was not to calculate prevalence or incidence but to highlight the relationship between working conditions

and mental health among workers, adjusting for several covariates including age.

The interviews were carried out in June and July 2020 and included several questions mostly on changes in economic, social, and health situations related to the COVID-19 pandemic. The final sample included 7065 observations.

## 2.2 | Outcomes

We created binary variables for the worsening of feelings of sadness and depression, feelings of anxiety and nervousness, sleeping difficulties, and feelings of loneliness. To do so, we coded variables as “1” those who declared having faced such difficulties in the last month and declared that these had worsened since the outbreak of the COVID-19 pandemic. The “0” value was thus attributed to those who either declared the absence of trouble or its presence but without worsening due to COVID-19.

## 2.3 | Explanatory variables and covariates

Our main explanatory variable was the “work setting” indicator, coded into three categories, “working from the usual place,” “working from home and from the usual place,” and “working at home only.” This variable was based on a question explicitly focusing on the COVID-19 period, by asking the respondent about his/her current working situation “since the beginning of the coronavirus epidemic.”

We included as covariates age (50–54, 55–59, and 60–65) and sex categories, the living condition (alone or not), the education (primary, secondary, and tertiary), and the occurrence of chronic disease since 2017 (diabetes, hip fracture, cancer, hypertension, chronic lung disease, and heart disease). We did not consider the self-reported health variable, which is known to be related to depression symptoms and could thus be tautological.<sup>12</sup> We also did not consider if the person had been infected by COVID-19, given that this occurred to <1% of the sample. Finally, we could not consider if the person already suffered from depression in a previous wave because this information was only available for 253 people (3.5% of the sample), among whom 57 suffered from depression (22.5% of those for whom we have information, and only 0.8% of the complete sample).

We then merged this sample with data from the Oxford COVID-19 Government Response Tracker, which includes information on containment and closure, economic, and health system policies.<sup>13</sup> The merging was

performed by attributing the COVID-19-related variables to each individual according to his/her country and interview date. In other words, each individual was characterized by the nonpharmacologic responses in his/her country at the moment (s)he was interviewed. We used as covariate the stringency index, which is a score based on 9 items: school closing, workplace closing, cancel public events, restrictions on gatherings, closing of public transport, stay-at-home requirements, restrictions on internal movements, international travel controls, and public information campaigns. Each item includes from three to five categories, from the least to the most severe restriction. The index is constructed as the sum of the scores, reordered on a 0–100 scale, with additional scores if the policy has been implemented nationwide (vs. regional or local implementation).<sup>13</sup>

## 2.4 | Statistical analysis

Univariate analyses were performed to measure the association between covariates and dependent variables, and between covariates and WAH indicators, using chi-square tests. All dependent variables were modeled using logistic regressions (with robust standard errors) and reported as risk differences (marginal effects). We first included the WAH variable adjusting for age and sex for living conditions (alone or not) and for the diagnosis of any chronic condition. We then adjusted for country fixed effects (second model) and for the stringency of public health measures (third model). Country fixed effects are expected to capture unobserved country characteristics.

In an additional analysis, we compared the outcome of those WAH with those who were not working before the pandemic, using the complete sample of persons aged 50–65 ( $n = 11\,097$ ), using logistic regressions with the same covariates. Indeed, the outcome of people who switched to WAH may be the sum of the effect from switching to WAH and the effect of the pandemic. Since the pandemic effect is more reliably observable among nonworkers (whose working status did not change during the pandemic), we isolated the independent WAH effect by comparing the outcome of people WAH to that those whose working condition did not change.

## 3 | RESULTS

### 3.1 | Descriptive analysis

Most employees worked from their usual working place (64.6%), but 18.2% worked from home exclusively (Table 1). A majority of participants were women

TABLE 1 Sample characterization—workers (frequencies and percentages in italics refer to nonworkers)

Variables	N (%)	(%)	Depression	Anxiety	Trouble sleeping	Loneliness
Total	7065	(100)	13.6	23.2	8.2	7.1
	<i>4961</i>		<i>17.6</i>	<i>25.3</i>	<i>9.8</i>	<i>11.5</i>
Usual place	3862	(64.63)	11.1	20.0	6.3	5.7
Home and usual place	1028	(17.20)	13.6	22.6	9.0	6.1
Home only	1086	(18.17)	14.7	27.2	8.5	8.5
<i>p value</i> *			<.01	<.01	<.01	<.01
Adequate internet connection						
No	274	(12.96)	17.9	28.0	11.3	9.9
Yes	1840	(87.04)	13.7	24.5	8.4	7.0
<i>P value</i>			.06	.23	.11	.09
Female	4093	(57.93)	17.1	27.7	9.7	8.7
	<i>3243</i>	<i>(65.37)</i>	<i>20.2</i>	<i>28.3</i>	<i>10.9</i>	<i>12.8</i>
Male	2972	(42.07)	8.6	7.1	6.2	4.8
	<i>1718</i>	<i>(34.63)</i>	<i>12.6</i>	<i>19.8</i>	<i>7.6</i>	<i>8.9</i>
<i>p value</i>			<.01	<.01	<.01	<.01
Age						
50–54	547	(7.74)	13.9	24.0	9.1	5.9
	<i>215</i>	<i>(4.33)</i>	<i>18.1</i>	<i>26.5</i>	<i>9.8</i>	<i>11.2</i>
55–59	2982	(42.21)	14.0	23.1	8.4	7.4
	<i>1218</i>	<i>(24.55)</i>	<i>18.0</i>	<i>27.0</i>	<i>10.3</i>	<i>12.1</i>
60–65	3536	(50.05)	13.1	23.2	8.0	7.0
	<i>3528</i>	<i>(71.11)</i>	<i>17.4</i>	<i>24.7</i>	<i>9.6</i>	<i>11.3</i>
<i>p value</i>			.60	.91	.62	.40
			.86	.31	.78	.75
Primary education	939	(13.32)	17.2	27.7	8.7	7.7
	<i>1579</i>	<i>(31.93)</i>	<i>20.5</i>	<i>28.2</i>	<i>10.9</i>	<i>12.3</i>
Secondary education	3652	(51.82)	12.5	20.6	7.5	6.5
	<i>2562</i>	<i>(51.81)</i>	<i>16.8</i>	<i>24.8</i>	<i>9.8</i>	<i>11.2</i>
Tertiary education	2457	(34.86)	13.7	25.4	9.0	7.6
	<i>804</i>	<i>(16.26)</i>	<i>14.1</i>	<i>21.6</i>	<i>7.5</i>	<i>10.8</i>
<i>p value</i>			<.01	<.01	.09	.19
			<.01	<.01	.03	.48
Not living alone	6092	(86.23)	13.0	23.0	7.8	5.9
	<i>4228</i>	<i>(85.22)</i>	<i>20.1</i>	<i>30.7</i>	<i>11.9</i>	<i>18.2</i>
Living alone	973	(13.77)	16.8	24.6	11.0	14.6
	<i>733</i>	<i>(14.78)</i>	<i>17.0</i>	<i>24.4</i>	<i>9.4</i>	<i>10.3</i>
<i>p value</i>			<.01	.27	<.01	<.01
			<.01	<.01	.04	<.01
No close death	6891	(97.62)	13.2	22.8	7.9	6.8
	<i>4852</i>	<i>(93.07)</i>	<i>28.4</i>	<i>36.8</i>	<i>13.7</i>	<i>16.7</i>
Close death	168	(2.38)	26.2	36.6	21.4	16.1
	<i>102</i>	<i>(2.06)</i>	<i>17.3</i>	<i>25.1</i>	<i>9.7</i>	<i>11.4</i>
<i>p value</i>			<.01	<.01	<.01	<.01
			<.01	<.01	.17	.10

(Continues)

TABLE 1 (Continued)

Variables	N (%)	(%)	Depression	Anxiety	Trouble sleeping	Loneliness
No chronic disease	6768	(95.80)	12.8	22.6	7.8	6.7
	4617	(93.07)	16.7	24.3	9.1	11.1
Any chronic disease	297	(4.20)	31.6	38.1	18.9	14.8
	344	(6.93)	29.9	40.1	19.2	15.8
<i>p value</i>			<.01	<.01	<.01	<.01
			<.01	<.01	<.01	<.01

\**p* value refers to the chi-square test of association between variables.

(57.9%), whereas few lived alone (13.8%), had a chronic disease (4.2%), or experienced the death of someone close due to COVID (2.4%). The worsening of depression and anxiety feelings, sleeping troubles, and loneliness was more prevalent among people working at home only, compared with those who worked at their usual place, fully or partially. Compared with individuals working in their usual setting, those WAH reported a greater worsening of depression feelings (+14.7% vs. 11.1%,  $p < .01$ ), anxiety feelings (+27.2% vs. 20.0%,  $p < .01$ ), sleeping troubles (+8.5% vs. 6.3,  $p < 0.01$ ), and loneliness feelings (+8.5% vs. 5.7,  $p < .01$ ). Table A1 in Appendix shows that “WAH only” is more likely among women, people with tertiary education, and those who experienced a close death. Regarding nonworkers (values in *italics* in Table 1), they are older, less educated, and more likely to suffer from chronic diseases and from mental health symptoms.

### 3.2 | Multivariate analysis

When adjusting for all covariates except country and stringency, WAH was significantly associated with a worsening of all dimensions (Table 2). Yet, when country fixed effects were factored in, no significant association of working at home was found with any of the health outcomes except for anxiety feelings, which was 3.5 percentage points (pp) higher among people working at home exclusively, compared to those working at their usual setting. When the contingency index was accounted for, the significant link with anxiety feelings worsening remained significant (4.3 pp higher risk).

Complete results with all covariates are presented in Table A2 in Appendix for the model including country fixed effects. Note, the worsening of all mental health dimensions was less pronounced among men and greater among those who had suffered a chronic disease in the recent past.

We then stratified the analysis on the change in any mental health symptom by country, adjusting for all

covariates except stringency. Only 6 of 50 estimates showed a statistically significant relationship between WAH and the worsening of any mental health symptom (Table A3 in Appendix).

### 3.3 | Additional multivariate analysis (including nonworkers)

Considering the full sample, WAH was linked to a significantly lower risk of loneliness feelings in comparison with nonworkers (Table 2). No other risk differed significantly in comparison with nonworkers including anxiety feelings; in other words, in comparison with people who were not working before or during the pandemic, whose change in psychological status cannot be attributed to changes in working conditions, WAH was not linked to poorer or better outcomes, reinforcing the argument for the absence of a specific WAH effect.

## 4 | DISCUSSION

### 4.1 | Key findings

WAH is positively related to a worsening of MH dimensions, but this link was mitigated when adjusting for the severity of nonpharmacologic measures against the COVID-19 pandemic, becoming nonsignificant when adjusting for country fixed effects. The relationship with worsening anxiety feelings remained significant in all cases. Nevertheless, this worsening did not differ in comparison with that observed among nonworkers, so that this effect may be more related to the pandemic and not to the specificities of WAH.

### 4.2 | Interpretation

Pre-COVID results about the link between WAH and mental health are scarce and controversial,<sup>7</sup> reflecting the ambiguity of WAH, marked by strong expected positive

TABLE 2 Marginal effect (ME) of worsening of MH symptoms (standard errors [SE] in parentheses)

	Depression		Anxiety		Trouble sleeping		Loneliness	
	ME	(SE)	ME	(SE)	ME	(SE)	ME	(SE)
Sample of workers, working in “usual place only” is the reference group								
Adjusting for covariates except for country and stringency								
Home and usual place	0.023	(0.012)*	0.015	(0.015)	0.017	(0.010)*	−0.001	(0.009)
Home only	0.026	(0.012)**	0.049	(0.016)***	0.008	(0.009)	0.022	(0.010)**
Adjusting for covariates and country								
Home and usual place	0.015	(0.012)	0.010	(0.015)	0.009	(0.010)	−0.009	(0.008)
Home only	0.014	(0.012)	0.035	(0.016)**	0.001	(0.009)	0.012	(0.009)
Adjusting for covariates and stringency								
Home and usual place	0.015	(0.013)	0.012	(0.016)	0.019	(0.010)*	−0.002	(0.009)
Home only	0.015	(0.013)	0.043	(0.017)**	0.002	(0.009)	0.016	(0.010)
Sample of workers and nonworkers, nonworkers are the reference group, adjusting for covariates and stringency								
Usual place only	−0.040	(0.008)***	−0.035	(0.010)***	−0.027	(0.006)***	−0.060	(0.007)***
Home and usual place	−0.021	(0.014)	−0.013	(0.017)	0.002	(0.011)	−0.049	(0.010)***
Home only	−0.020	(0.013)	0.022	(0.017)	−0.016	(0.010)*	−0.032	(0.010)***

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$



and negative effects. A recent paper showed a negative effect of WAH on mental health symptoms<sup>6</sup> but, unlike our study, that investigation focused on a single country and could not control for the severity of nonpharmacologic measures. In our paper, the negative link between WAH and mental health symptoms exists but disappears when the stringency of measures is factored in.

In other words, in our sample, WAH did not seem to be a major driver of mental health deterioration, which seemed more related to COVID-related contextual factors. Stated differently, although the pandemic was observed to increase psychologic symptoms,<sup>14,15</sup> WAH does not seem to have been a major cause of this growth.

### 4.3 | Strength and limitations

The use of a cross-country sample allows us to evaluate the consistency of the association across various settings and to control for COVID-19 effects. The focus on mature adults allows for the analysis of the relationship on a more experienced working population that is less likely to be affected by precarious jobs and by the adversities of a short working experience. Finally, this study contributes to a new research topic on a new phenomenon that few authors have addressed so far.

Our study has some limitations. First is the question on work setting related to participants' situation since the start of the COVID-19 pandemic. It may well be that some people were working at home before that. However, the pre-COVID literature shows that this situation was marginal in most European countries, so we do not expect that this represents a major bias. Second, the data did not allow us to identify the type of job; WAH may be a very different experience for people doing routine jobs with little autonomy and great pressure (e.g., working for a call center) compared with high-skilled jobs enjoying high autonomy (e.g., top managerial positions, researchers, lawyers, etc.). We did not consider the quality of WAH condition, which may vary according to the type of employer (e.g., large vs. small firm, public vs. private sector), and the living arrangement (e.g., if the spouse is also in teleworking or if children are at home).

## 5 | CONCLUSION

It is too early to draw definite conclusions on the link between WAH and mental health. This study was performed in the first months of the COVID-19 pandemic, characterized by strong uncertainty and fear, and severe restrictions that affected most people's everyday lives, social relationships, and working situations. Also, WAH was—and still is—in its infancy, with firms and people struggling to find

the best balance on how to manage this new reality. We, therefore, need to wait for the post-COVID period, when we expect that WAH will be maintained at least partially under new “normal” conditions. Our findings show that WAH was certainly not a major cause of MH deterioration among European mature adults during the first months of the pandemic.

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### DISCLOSURE

*Approval of the research protocol:* N/A. *Informed Consent:* N/A. *Registry and the Registration No. of the study/trial:* N/A. *Animal Studies:* N/A. *Conflict of Interest:* none.

### AUTHOR CONTRIBUTION

JP, FS, and PL designed the protocol of the study. JP and PPB constructed the database. JP did the statistical analyses and drafted the manuscript. PPB, PL, and FS participated in the interpretation of the results and reviewed the paper.

### DATA AVAILABILITY STATEMENT

Data are available upon request by the coordination of the Survey of Health, Aging and Retirement in Europe (SHARE), [www.share-project.org](http://www.share-project.org)

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## SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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