



Working conditions and health in Spain during the COVID-19 pandemic: Minding the gap

Sergio Salas-Nicás^a, Salvador Moncada^b, Clara Llorens^{a,b,c}, Albert Navarro^{a,d,*}

^a Research Group on Psychosocial Risks, Organization of Work and Health (POWAH), Autonomous University of Barcelona (UAB), Cerdanyola del Vallès, Spain

^b Union Institute of Work, Environment and Health (ISTAS), Reference Centre on Work Organisation and Health, Barcelona, Spain

^c Sociology Department, Faculty of Sociology and Political Sciences, Autonomous University of Barcelona (UAB) Cerdanyola del Vallès, Spain

^d Biostatistics Unit, Faculty of Medicine, Autonomous University of Barcelona (UAB), Cerdanyola del Vallès, Spain

ARTICLE INFO

Keywords:

COVID-19

Working conditions

Occupational health

Inequalities

Spain

ABSTRACT

Background: The emergence of the COVID-19 pandemic has had major consequences in the workplace, both in terms of the number of cases among the working population and the enormous changes made to cope with it. The objective of this study is to describe the impact of COVID-19 on the working conditions and health of wage-earners in Spain.

Methods: Cross-sectional study carried out between the end of April and the end of May 2020 among the wage-earning population. Sample included $n = 20,328$ participants obtained through an online survey.

Results: A situation of high-strain was reported by 44.3% of workers, 42.6% were concerned about possible job loss, 75.6% about finding a new job if they lost the present one, 69.7% were worried about salary reduction, 68% about becoming infected at work and 72.3% of being a transmitter of the virus. Among those who regularly went to work, 13.1% did so with symptoms compatible with COVID-19 and 71.2% stated that they had done so without adequate protection measures. 36.7% of workers believe that their health worsened, 41.6% had severe trouble sleeping during the last month, 55.1% were at risk of poor mental health and consumption more than doubled of tranquilisers and opioid analgesics, compared to the pre-pandemic situation.

Conclusion: The impact of COVID-19 on the wage-earning population has been enormous, with high exposures to harmful working conditions and very poor health indicators, which, compared to the pre-pandemic situation, means significant deterioration. Important inequalities are observed according to class, gender, age and wage.

1. Introduction

To date, the COVID-19 pandemic has affected millions of people around the world with disastrous consequences for many of them. At the time of writing this paper, in mid-September 2020, there were more than 670,000 confirmed cases in Spain, one of the most badly affected countries, more than 4.8 million in Europe and over 30 million worldwide.

Social inequalities in the prevalence of chronic diseases and social determinants of health (among them, employment) have greatly influenced the evolution of the pandemic. We may consider the inequalities in infection and mortality rates due to COVID-19 as one result of these inequalities and of previously existing determinants (Bambra et al., 2020).

The world of employment has been seriously affected, due not only to numbers of cases among the working population, but also to effects derived from the policies and measures decreed by governments to control the pandemic (e.g. “lockdown”, enforced teleworking...) as well as by effects deriving from labour management practices, which have led to the deterioration of working conditions, albeit in a rather uneven manner.

The COVID-19 pandemic therefore represents a tremendous challenge for occupational health. Many occupations involve direct contact or physical proximity to other people and pose a higher risk of exposure and infection, while others offer the possibility of working from home, considerably reducing the risk of contagion. Healthcare professionals are at increased risk of exposure due to their close contact with COVID-19 patients. At the same time they themselves are a potential source of

* Corresponding author at: Biostatistics Unit, Faculty of Medicine, Autonomous University of Barcelona (UAB), Avda. Can Domènech S/N, 08193 Cerdanyola del Vallès, Spain.

E-mail address: albert.navarro@uab.cat (A. Navarro).

<https://doi.org/10.1016/j.ssci.2020.105064>

Received 25 September 2020; Accepted 20 October 2020

Available online 26 October 2020

0925-7535/© 2020 Published by Elsevier Ltd.

transmission of the disease to colleagues, patients and relatives (Burdorf et al., 2020).

The challenge involves not only higher qualified health personnel but also includes more vulnerable workers in manual and less qualified occupations and the most precarious and lowest paid jobs (Sim, 2020). For people employed in such occupations, COVID-19 is experienced as a synergistic, simultaneous pandemic (syndemic) that interacts with non-communicable diseases and existing social conditions (Bambra et al., 2020).

At present we still do not know enough about mechanisms of the pandemic, and it will take some time to generate the information necessary to permit making decisions based on evidence (Burdorf et al., 2020). Meanwhile, we must continue investigating and acting despite the uncertainties. Publications in the specialised literature so far have largely been focused on healthcare personnel. This paper, on the other hand, presents the main results of the survey “Working conditions, insecurity and health of workers resident in Spain in the context of COVID-19” (COTS, for its acronym in Spanish), whose objective was to highlight impacts of the COVID-19 pandemic on the working conditions and health of the wage-earning population in Spain. We hope that the results presented here contribute to understanding the effects of this crisis and facilitate the search for measures to face it.

2. Material and methods

2.1. Study population

The study population consists of all wage-earners residing in Spain who had a job on 14 March 2020 (the day the state of alert began), including people who were subsequently fired, or affected by a temporary lay-off procedure (hereafter referred to as “ERTE”, from the term used in Spanish, “Expediente de Regulación Temporal de Empleo”).

2.2. Design, data collection and sample size

Observational cross-sectional study. The data come from an online survey conducted between 29 April and 28 May 2020 (between six and ten weeks after the state of alert was declared in Spain). The sample includes all questionnaires completed by wage-earners, once we had eliminated those corresponding to persons residing outside Spain ($n = 21$) and those with fewer than 20% of valid responses ($n = 82$). The final sample consists of $n = 20,328$ participants.

2.3. Variables

Various questions were prepared ad hoc for this investigation, others were obtained from the third psychosocial survey carried out in Spain (ERP-2016) (ISTAS, 2019), from the survey on alcohol and other drugs in Spain (EDADES) of the National Drug Plan (Plan Nacional sobre Drogas, 2018), from the SF-36 (Vilagut et al., 2005) and items corresponding to the short version of the Copenhagen Psychosocial Questionnaire (CoPsoQ) (Burr et al., 2019) adapted and validated in Spain (COPSOQ-Istas21) (ISTAS, 2020). The variables recorded correspond to different blocks: a) sociodemographic, b) organisational measures, c) working conditions, d) sick leave and sickness presenteeism, e) health and f) drug consumption. The survey questions used in this paper are shown in table 1.

2.4. Statistical analysis

Percentages and prevalences of the different items were estimated with their respective 95% confidence intervals (95% CI). In order to avoid biases in the estimates, we weighted by the distribution of gender crossed with age and occupational class (the nine large groups of the national classification of occupations –CNO-11-) taken from the survey of the active population (EPA) for the first quarter of 2020, also

Table 1

Survey questions used in this paper.

Topic	Question	Responses	Source
Organisational measures and COVID sick leave	Since the state of alert was declared, in what situations have you been? AND Today, what is your situation?	Fired / Not renewed / Working Time Reduction / Contract Suspension / Suspension and Reduction / Mainly going to work to the workpost / Combination of teleworking and going to work / Mainly teleworking / COVID-19 sick leave with positive test / COVID-19 sick leave with negative test / COVID-19 sick leave for contact with a person with positive test / COVID-19 sick leave for contact with a person with negative test	Ad-hoc
Salary covering basic needs	How often does your current salary cover the daily basic needs of your home?	Always / Many times / Sometimes / Only once / Never	ERP16
Job loss insecurity	Are you worried about becoming unemployed?	To a very large extent / To a large extent / Somewhat / To a small extent / To a very small extent	COPSOQ3
Labor market insecurity	Are you worried about it being difficult for you to find another job if you became unemployed?	To a very large extent / To a large extent / Somewhat / To a small extent / To a very small extent	COPSOQ3
Wage insecurity	Are you worried about a decrease in your salary?	To a very large extent / To a large extent / Somewhat / To a small extent / To a very small extent	COPSOQ3
Worrying about COVID19 infection at work	Are you worried about the possibility of becoming infected with COVID-19 at work?	To a very large extent / To a large extent / Somewhat / To a small extent / To a very small extent	Ad-hoc
Worrying about spreading COVID19	Are you worried about the possibility of infecting someone with COVID-19?	To a very large extent / To a large extent / Somewhat / To a small extent / To a very small extent	Ad-hoc
Working without protection against COVID19	Since the state of alert was declared, do you think that you have had to work without adequate protection measures to avoid contagion by COVID-19?	Always / Often / Sometimes / Seldom/ Never	Ad-hoc
Working with COVID-19 symptoms	Since the state of alert was declared, have you gone to work with symptoms (fever, cough, shortness of breath or general malaise)?	No, never / Yes, few days / Yes, some days / Yes, most days / Yes, always	Ad-hoc
General health	How do you consider your current state of	Better / Unaltered / Worse	Ad-hoc

(continued on next page)

Table 1 (continued)

Topic	Question	Responses	Source
Sleep problems	health, compared to what you had before the state of alert was declared? During the past 4 weeks, how often have you slept badly and restlessly?	Always / Many times / Sometimes / A few times / Never	COPSOQ3
At risk of poor mental health	Q1: During the past 4 weeks, how often have you been very nervous? Q2: During the past 4 weeks, how often have you felt so depressed that nothing could cheer you up? Q3: During the past 4 weeks, how often have you felt calm and peaceful? Q4: During the past 4 weeks, how often have you felt sad or unhappy? Q5: During the past 4 weeks, how often have you been happy?	Always / Most of the time / A good bit of the time / Some of the time / A little of the time / Never	SF-36
Tranquilizers	In the past thirty days, have you used any tranquilizers/sedatives or sleeping pills? <i>Are included: Lexatín, orfidal, noctamid, trankimazin, rohipnol, tranxilium, diacepam, valium, stilnox, zolpidem, hypnotics, benzos, benzodiazepine, barbiturates, etc.</i> <i>Are not included: valerian, passionflower, dormidina, melatonin</i>	No / Yes, I was taking before and now I take the same dose / Yes, I was taking before but now I have increased the dose or I have changed to a stronger one / Yes, I do not usually consume them but in this period I have	EDADES
Painkillers (opioids)	In the past thirty days, have you used painkillers (opioids)? <i>Are included: Adolonta, Tramadol, Zaldiar, Enanplus, Tradonal, Algidol, Dolocatil, Codeisan, MST continus, Durogesic, Dolantina, Subuxone, Oxiconona, Fentanilo, etc.</i> <i>Are not included: Paracetamol, Ibuprofen, Aspirin, Nolotil, etc.</i>	No / Yes, I was taking before and now I take the same dose / Yes, I was taking before but now I have increased the dose or I have changed to a stronger one / Yes, I do not usually consume them but in this period I have	EDADES

ERP16: III Spanish psychosocial risks survey (2016).

COPSOQ3: Copenhagen psychosocial questionnaire, third version.

SF-36: 36-Item short form health survey questionnaire.

EDADES: Spanish survey on alcohol and other drugs.

respecting the distribution by autonomous communities (Spanish administrative regions).

A sensitivity analysis was performed to examine the effect of a possible selection bias assuming that more responses would be obtained from healthcare workers than expected according to the population distribution. Unfortunately in Spain the exact number of active healthcare professionals is not known, we only have certain data on the public sector or associations of doctors and nurses. Once the sample obtained had been weighted, doctors, nurses and nursing assistants accounted for

6.5% of the participants. The sensitivity analysis consisted of re-estimating the percentages or global prevalences of all the items of interest, assuming that in reality this group represented only half, that is, 3.25%.

3. Results

The characteristics of the COTS sample, unweighted and weighted, and a comparison with EPA data is presented in Table 2.

3.1. Workplace organisational measures taken to address the pandemic

As Table 3 shows, 5.7% of workers lost their jobs during the first weeks of the state of alert, 3.8% due to dismissal and 1.9% due to the non-renewal of their contract. One out of four was affected by an ERTE, mostly suspension of contract. Just over one in three (37.8%) continued going to work at their company or institution on a regular basis and 30.1% carried out telework.

3.2. Relevant working conditions during the pandemic

We may observe in Table 3 that 44.3% of workers suffered high strain (high psychological job demands and low job control), a similar percentage (42.6%) was concerned about losing their job, three out of four about finding another job if they were to lose the present one, about seven out of ten were concerned about the possibility of their wages being lowered, becoming infected at work, or transmitting the virus to others. Among those who regularly went to work at their company or institution, 71.2% stated that they had done so at some time without

Table 2

Characteristics of COTS sample and comparison with EPA.

	COTS		Weighted COTS		EPA
	%	95CI%	%	95CI%	%
Gender					
Male	42.1	(41.4–42.8)	51.0	(50.0–52.0)	51.8
Female	57.8	(57.1–58.4)	48.9	(47.9–49.9)	48.2
Other	0.1	(0.1–0.2)	0.1	(0.1–0.2)	NC
Age					
16–34 years old	10.4	(10.0–10.9)	25.6	(24.4–26.7)	26.0
35–49 years old	44.5	(43.8–45.2)	43.7	(42.7–44.7)	43.8
50 years old or more	45.0	(44.4–45.7)	30.7	(30.0–31.5)	30.3
Occupational class					
Non manual	56.7	(56.0–57.4)	46.1	(45.1–47.1)	45.0
Manual	43.3	(42.6–44.0)	53.9	(52.9–54.9)	55.0
Occupational group (CNO11)					
Directors and managers	0.7	(0.6–0.8)	2.6	(2.1–3.3)	2.3
Scientific and intellectual technicians and professionals	25.6	(25.0–26.3)	20.2	(19.5–20.9)	19.3
Technicians and Associate Professionals	13.3	(12.9–13.8)	11.3	(10.8–11.9)	11.3
Accounting, administrative and other office employees	17.1	(16.6–17.6)	12.0	(11.5–12.5)	12.0
Hotel and catering workers, personnel services...	23.3	(22.7–23.9)	21.4	(20.7–22.2)	21.0
Skilled workers in the agricultural sector, livestock...	0.3	(0.3–0.4)	1.0	(0.7–1.3)	1.0
Skilled workers in the manufacturing industry	5.1	(4.8–5.4)	9.8	(9.0–10.5)	10.4
Plant and machinery operators	2.3	(2.1–2.6)	7.7	(6.8–8.6)	8.1
Elementary occupations	12.2	(11.8–12.7)	14.0	(13.4–14.7)	14.6
Employment contract relationship					
Permanent	80.8	(80.2–81.3)	78.2	(77.3–79.1)	75.0
Temporary	19.2	(18.7–19.8)	21.8	(20.9–22.7)	25.0

NC: Not considered in the survey.

Table 3

Organisational measures, working conditions, COVID-19 sick leave and sickness presenteeism, global and by occupational class and salary.

	Global		Occupational class				Salary covering basic needs			
			Non manual		Manual		Sufficient		Insufficient	
	%	95%CI	%	95%CI	%	95%CI	%	95%CI	%	95%CI
Fired	3.8	(3.4–4.2)	2.4	(2.0–2.9)	5.1	(4.4–5.9)	NA	NA	NA	NA
Not renewed	1.9	(1.7–2.2)	1.3	(1.0–1.6)	2.5	(2.2–3.0)	NA	NA	NA	(NA)
Working Time Reduction (ERTE [*])	3.4	(3.0–3.7)	4.1	(3.7–4.6)	2.7	(2.3–3.3)	3.5	(3.1–4.0)	3.5	(3.0–4.2)
Contract Suspension (ERTE [*])	21.8	(21.0–22.7)	13.1	(12.2–14.0)	29.1	(27.8–30.5)	17.8	(16.9–18.8)	33.4	(31.7–35.2)
Supension and Reduction (ERTE [*])	1.0	(0.8–1.3)	0.8	(0.6–1.1)	1.2	(0.8–1.6)	1.1	(0.8–1.5)	0.9	(0.6–1.4)
Going to work to the workpost	37.8	(36.8–38.8)	25.6	(24.6–26.8)	48.5	(47.0–50.1)	39.1	(37.9–40.3)	40.0	(38.3–41.8)
Combination of teleworking and going to work	4.9	(4.5–5.4)	8.4	(7.8–9.2)	2.0	(1.5–2.6)	6.3	(5.7–6.9)	2.8	(2.3–3.5)
Mainly teleworking	25.2	(24.4–26.0)	49.9	(48.6–51.2)	4.3	(3.7–4.9)	31.9	(30.8–33.0)	14.4	(13.3–15.6)
High strain	44.3	(43.1–45.4)	37.2	(35.9–38.5)	51.0	(49.2–52.8)	39.5	(38.2–40.8)	54.8	(52.7–56.9)
Job loss insecurity	42.6	(41.5–43.6)	37.1	(35.8–38.4)	47.4	(45.8–49.1)	37.0	(35.7–38.2)	54.4	(52.5–56.2)
Labor market insecurity	75.6	(74.7–76.4)	69.8	(68.7–71.0)	80.8	(79.6–82.1)	71.4	(70.3–72.4)	84.5	(83.0–85.8)
Wage insecurity	69.7	(68.7–70.6)	64.4	(63.0–65.7)	74.2	(72.8–75.6)	65.6	(64.4–66.8)	78.3	(76.7–79.8)
Worrying about COVID19 infection at work	68.0	(67.0–69.0)	62.2	(60.9–63.6)	73.0	(71.6–74.5)	64.9	(63.7–66.1)	74.6	(72.9–76.2)
Worrying about spreading COVID19	72.3	(71.4–73.3)	69.8	(68.6–71.1)	74.6	(73.2–75.9)	71.2	(70.0–72.3)	76.6	(74.9–78.1)
Working without protection against COVID19 [§]	71.2	(69.7–72.7)	68.4	(66.0–70.6)	72.9	(70.9–74.8)	68.7	(66.8–70.5)	76.2	(73.6–78.6)
COVID-19 sick leave (case or contact) [#]	6.1	(5.6–6.6)	4.7	(4.2–5.3)	7.3	(6.5–8.1)	5.6	(5.1–6.2)	7.5	(6.5–8.6)
COVID-19 sick leave (case) [#]	3.6	(3.3–4.0)	2.8	(2.5–3.2)	4.3	(3.8–4.9)	3.2	(2.8–3.6)	4.6	(4.0–5.3)
Working with COVID-19 symptoms [§]	13.1	(12.1–14.2)	12.7	(11.2–14.4)	13.3	(11.9–14.7)	10.6	(9.5–11.7)	18.2	(16.0–20.6)

NA Don't apply. People unemployed at the time of the survey were not asked this question.

^{*} Temporary lay-off proceedings. In Spanish, Expediente de Regulación Temporal de Empleo (ERTE).[§] Estimated among those who went to work to his/her company or institution.[#] Confirmed or suspected.

adequate protection measures against COVID-19.

3.3. Sick leave and sickness presenteeism

Still looking at Table 3, 6.1% of workers had at least one sick leave episode related to COVID-19, of which 3.6% were due to being a case (suspected or confirmed), while 13.1% of workers who went to work regularly during the state of alert, reported having done so at some time with symptoms compatible with COVID-19.

3.4. Health and consumption of selected pharmaceutical drugs

Table 5 shows that over one in three (36.7%) wage earners affirm

that their health status worsened during the pandemic, two in five (41.6%) often or almost always slept poorly during the last four weeks, and more than half (55.1%) were classified as at risk of poor mental health. Tranquilizer use went from 9.5% pre-pandemic to 21.5%, and one in three workers who were already consuming either increased the dose or switched to a stronger drug. The consumption of opioid analgesics doubled, from 8.9% to 18.6%.

3.5. Working conditions and health-related inequalities

Results by occupational class and salary are shown in Tables 3 and 5. Regarding organisational measures, Table 3, it appears that occupational class discriminates better than just salary, so we see for example

Table 4

Organisational measures, working conditions, COVID-19 sick leave and sickness presenteeism, by gender and age.

	Gender [*]				Age					
	Male		Female		16–34 years old		35–49 years old		50 years old or more	
	%	95%CI	%	95%CI	%	95%CI	%	95%CI	%	95%CI
Fired	4.3	(3.6–5.1)	3.3	(2.9–3.7)	6.6	(5.3–8.2)	3.3	(2.8–3.8)	2.2	(1.8–2.6)
Not renewed	1.8	(1.4–2.2)	2.1	(1.8–2.4)	3.4	(2.7–4.3)	1.7	(1.4–2.0)	1.0	(0.8–1.3)
Working Time Reduction (ERTE [#])	4.0	(3.4–4.6)	2.8	(2.4–3.2)	3.3	(2.5–4.3)	3.9	(3.5–4.4)	2.7	(2.3–3.1)
Contract Suspension (ERTE [#])	23.5	(22.1–24.9)	20.1	(19.2–21.0)	26.9	(24.5–29.5)	21.8	(20.7–22.8)	17.6	(16.6–18.6)
Supension and Reduction (ERTE [#])	1.3	(0.9–1.9)	0.6	(0.5–0.8)	1.7	(1.1–2.8)	0.9	(0.6–1.2)	0.5	(0.4–0.7)
Going to work to the workpost	41.7	(40.1–43.3)	33.8	(32.7–34.9)	35.7	(33.0–38.6)	38.5	(37.2–39.8)	38.5	(37.3–39.8)
Combination of teleworking and going to work	4.8	(4.1–5.6)	5.0	(4.5–5.5)	4.1	(3.0–5.6)	5.1	(4.6–5.7)	5.3	(4.8–5.8)
Mainly teleworking	20.8	(19.6–22.1)	29.7	(28.7–30.7)	22.4	(20.2–24.8)	26.4	(25.3–27.5)	25.8	(24.8–26.8)
High strain	40.8	(39.0–42.6)	47.8	(46.5–49.0)	42.9	(39.6–46.2)	46.1	(44.6–47.5)	42.7	(41.3–44.1)
Job loss insecurity	44.1	(42.4–45.8)	40.9	(39.7–42.1)	52.2	(49.1–55.3)	44.1	(42.7–45.4)	32.7	(31.5–34.0)
Labor market insecurity	78.3	(77.0–79.6)	72.8	(71.7–73.8)	80.5	(78.1–82.8)	78.1	(76.9–79.2)	68.2	(67.0–69.3)
Wage insecurity	70.4	(68.8–72.0)	68.9	(67.8–70.0)	70.4	(67.5–73.2)	70.0	(68.7–71.1)	68.7	(67.5–69.9)
Worrying about COVID19 infection at work	66.6	(65.0–68.2)	69.5	(68.4–70.5)	66.5	(63.5–69.4)	69.1	(67.9–70.3)	67.7	(66.5–68.9)
Worrying about spreading COVID19	71.8	(70.3–73.3)	73.0	(71.9–74.0)	73.6	(70.9–76.1)	73.5	(72.3–74.6)	69.7	(68.5–70.9)
Working without protection against COVID19 [§]	70.1	(67.8–72.3)	72.6	(70.7–74.3)	74.9	(70.4–78.8)	72.3	(70.4–74.2)	66.7	(64.6–68.8)
COVID-19 sick leave (case or contact) ^{&}	5.1	(4.5–5.8)	7.1	(6.5–7.8)	6.1	(5.0–7.5)	5.7	(5.1–6.4)	6.6	(6.0–7.2)
COVID-19 sick leave (case) ^{&}	2.9	(2.4–3.4)	4.4	(3.9–4.9)	3.1	(2.4–4.0)	3.6	(3.1–4.1)	4.1	(3.7–4.6)
Working with COVID-19 symptoms [§]	9.9	(8.5–11.5)	17.2	(15.8–18.8)	14.0	(11.2–17.4)	12.9	(11.5–14.4)	12.5	(11.2–13.9)

^{*} Gender “Other” was not considered due to its low sample size.[#] Temporary lay-off proceedings. In Spanish, Expediente de Regulación Temporal de Empleo (ERTE).[§] Estimated among those who went to work to his/her company or institution.[§] Confirmed or suspected.

Table 5

Health and selected medical drugs consumption, global and by occupational class and salary.

	Global		Occupational class				Salary covering basic needs			
			Non manual		Manual		Sufficient		Insufficient	
	%	95%CI	%	95%CI	%	95%CI	%	95%CI	%	95%CI
Positive change in general health	5.2	(4.7–5.7)	5.6	(5.0–6.3)	4.8	(4.1–5.6)	5.0	(4.5–5.6)	5.2	(4.3–6.3)
Negative change in general health	36.7	(35.7–37.6)	37.5	(36.2–38.8)	36.2	(34.7–37.6)	33.6	(32.5–34.9)	43.4	(41.6–45.2)
Sleep problems: Sometimes	30.6	(29.6–31.5)	30.8	(29.6–32.0)	30.4	(28.9–31.8)	31.2	(30.0–32.3)	29.5	(27.7–31.3)
Sleep problems: Many times / Always	41.6	(40.7–42.6)	40.9	(39.6–42.2)	42.5	(41.0–44.0)	36.9	(35.7–38.1)	51.0	(49.2–52.9)
At risk of poor mental health *	55.1	(54.0–56.1)	52.8	(51.5–54.1)	57.1	(55.4–58.7)	48.7	(47.4–50.0)	67.2	(65.3–69.0)
Tranquilizers: same dose	6.1	(5.7–6.5)	5.6	(5.3–6.2)	6.2	(5.6–6.8)	5.7	(5.3–6.2)	6.8	(6.1–7.6)
Tranquilizers: increased dose	3.4	(3.1–3.8)	3.3	(2.9–3.7)	3.5	(3.1–4.0)	2.7	(2.4–3.1)	5.0	(4.4–5.6)
Tranquilizers: new consumer	12.0	(11.4–12.6)	11.6	(10.8–12.4)	12.5	(11.6–13.5)	10.5	(9.8–11.2)	14.8	(13.6–16.0)
Painkillers (opioids): same dose	6.6	(6.2–7.1)	5.3	(4.9–5.9)	7.7	(7.0–8.4)	5.8	(5.3–6.3)	8.6	(7.7–9.5)
Painkillers (opioids): increased dose	2.3	(2.0–2.6)	1.8	(1.5–2.2)	2.7	(2.3–3.1)	1.7	(1.4–2.0)	3.6	(3.0–4.2)
Painkillers (opioids): new consumer	9.7	(9.1–10.3)	8.0	(7.3–8.7)	11.1	(10.3–12.0)	8.3	(7.7–9.0)	12.4	(11.3–13.5)

* To define “at risk of poor mental health” we used the SF-36 cut-off ≤ 56 .

that more manual workers lost their job than non-manual (7.6% vs. 3.7%), more were affected by ERTes of contract suspension (30.3% vs. 13.9%), many more had to regularly go to work in person (48.5% vs. 25.6%) and they teleworked much less (6.3% vs. 58.3%). On the other hand, when we look at working conditions, it seems that the differences according to salary or occupational class are very similar: the most harmful exposures occur systematically in manual workers and among those whose wages never or almost never cover their basic needs. For example, differences for manual/non-manual and sufficient/insufficient salary are approximately 14% for the case of high job stress, and over 10% for the three items of job insecurity (job loss, find another job, wages). In addition, manual and low-wage workers more often took sick leave due to COVID-19. On the other hand, while occupational class does not discriminate in terms of going to work with symptoms, salary evidently does so (18.2% among those with insufficient wages vs. 10.6% among those with sufficient wages). Table 5 presents results stratified in terms of health and drug consumption. In this case, except for mental health and consumption of opioid analgesics, where the situation is worse for manual workers, occupational class does not seem to be associated; salary however is: those with insufficient salary present almost 10% more deterioration in general health (43.4% vs 33.6%), 14.1% more problems sleeping often or almost always (51% vs 36.9%), 18.5% a greater risk of poor mental health (67.2% vs 48.7%) and their consumption of tranquilisers and opioid analgesics is consistently higher than those with a sufficient salary, both among new consumers (14.8% in tranquilizers and 12.4% in analgesics vs 10.5% and 8.3% respectively) and among all consumers (26.6% and 24.6% for tranquilizers and analgesics, vs 18.9% and 15.8%).

Tables 4 and 6 show the results by gender and age. There are gender

inequalities in terms of organisational measures, working conditions and sick leave and presenteeism, although smaller than those related to occupational class or salary (Table 4). The differences according to gender are observed above all in health (Table 6): almost 10% more women than men report their health worsened, 16.1% more women often or almost always have sleep problems, and 17% more women are at risk of poor mental health. Consumption of tranquilizers is much higher in women (15.4% vs. 8.8% of new consumers and 28.4% vs. 15.8% of all consumers), and the same occurs with the consumption of opioids (22.2% consumers among women, 15.2% among men). Regarding age, the loss of employment among young people stands out (10% for those under 35, compared to 5% for those between 35 and 49 years old and 3.2% among those over 50), young people are also the most affected by ERTes of contract suspension and, in accordance with the above, those most exposed to high insecurity about losing their job (more than half of those aged 16–34 years, almost 20% more than those over 50), (Table 4). Regarding health, Table 6, the differences are moderate, generally those over 50 being in a better situation. Regarding drug consumption, although older participants consume the most, the relative increase in numbers of young people consuming during the pandemic is clearly superior, especially in the case of tranquilizers: the number of consumers aged 16–34 years is 3.5 times higher than the pre-pandemic figure, while among those aged 35–49 years it has multiplied by 2.4 and among those over 50 year by 1.8.

3.6. Sensitivity analysis

If doctors, nurses and nursing assistants represented half of what they represent in our sample (that is, 3.25% instead of 6.5%), the point

Table 6

Health and selected medical drugs consumption by gender and age.

	Gender *				Age					
	Male		Female		16–34 years old		35–49 years old		50 years old or more	
	%	95%CI	%	95%CI	%	95%CI	%	95%CI	%	95%CI
Positive change in general health	4.9	(4.2–5.7)	5.5	(5.0–6.1)	7.4	(6.0–9.0)	4.8	(4.2–5.4)	3.9	(3.4–4.3)
Negative change in general health	31.9	(30.4–33.5)	41.6	(40.5–42.7)	37.9	(35.1–40.7)	38.6	(37.3–39.8)	32.9	(31.7–34.0)
Sleep problems: Sometimes	32.1	(30.6–33.7)	28.9	(27.9–30.0)	30.5	(27.9–33.2)	30.5	(29.4–31.8)	30.6	(29.4–31.8)
Sleep problems: Many times / Always	33.8	(32.2–35.4)	49.9	(48.7–51.0)	44.8	(41.9–47.7)	42.2	(40.9–43.5)	38.2	(37.0–39.4)
At risk of poor mental health *	46.8	(45.1–48.5)	63.8	(62.7–64.9)	58.0	(55.0–61.0)	56.8	(55.5–58.1)	49.7	(48.4–51.0)
Tranquilizers: same dose	4.8	(4.3–5.4)	7.3	(6.8–7.9)	2.6	(1.9–3.5)	5.5	(4.9–6.1)	9.8	(9.1–10.6)
Tranquilizers: increased dose	2.2	(1.8–2.7)	4.7	(4.3–5.1)	2.1	(1.5–3.0)	3.6	(3.2–4.1)	4.2	(3.7–4.7)
Tranquilizers: new consumer	8.8	(8.0–9.7)	15.4	(14.5–16.2)	11.9	(10.4–13.7)	12.7	(11.9–13.6)	11.2	(10.4–12.0)
Painkillers (opioids): same dose	5.3	(4.8–6.0)	8.0	(7.4–8.6)	4.4	(3.5–5.5)	6.8	(6.3–7.5)	8.2	(7.5–9.0)
Painkillers (opioids): increased dose	1.4	(1.0–1.8)	3.3	(2.9–3.7)	1.7	(1.1–2.4)	2.5	(2.2–3.0)	2.5	(2.1–2.9)
Painkillers (opioids): new consumer	8.5	(7.7–9.4)	10.9	(10.3–11.7)	9.4	(8.0–11.0)	10.4	(9.7–11.2)	8.9	(8.2–9.7)

* Gender “Other” was not considered due to its low sample size.

* To define “at risk of poor mental health” we used the SF-36 cut-off ≤ 56 .

estimates obtained would vary, at most, by 1.8% for the percentage of workers who consider that they had to work without adequate protection measures (it would be 69.4% instead of 71.2%), followed by a decrease of 1.1% of workers who would have gone to work regularly during the state of alert (dropping from 37.8% to 36.7%) and an increase of 0.9% of employees worried about finding another job if they were to lose the present one (from 75.6% to 76.5%). Estimates related to health would vary by at most 0.5%, specifically for those who report a worsened health status, the estimate would fall from 36.7% to 36.2%. Of the total of 32 estimates made, 27 would vary by under 0.5%.

4. Discussion

The effects of the COVID-19 pandemic on all spheres of life have been enormous, and that of occupation has been no exception. Our study estimates that approximately a third of Spanish employees continued to attend their company or institution regularly, some lost their jobs, others were affected by temporary lay-offs, others had to telework from home, etc. It is obvious that this abrupt break with the occupational routine can have important consequences on working conditions and the health of workers.

The unexpected emergence of the pandemic surprised those responsible for Public Administrations, Social Agents and even most researchers, something which, together with initial doubts regarding the severity of the disease and how it is transmitted within workplace settings or to the usefulness of personal protective equipment (Semple and Cherrie, 2020), could explain to a large extent why almost three out of four workers who continued going to their workplace consider that they had done so without adequate protection measures.

Furthermore, it appears that working conditions worsened notably. Thus, based on the ERP-2016 we may estimate, using exactly the same methodology, certain figures which permit a comparison with observations made during the pandemic. For example, in 2016 the percentage of workers in a situation of high strain (according to the conceptualisation of the “demand-control” model) (Karasek et al., 1981) was 22.3%, 58.1% were concerned about losing their jobs, 68.4% about not finding another job if the present one were to be lost, or 63% about their salary being reduced (unpublished data). Therefore, during the pandemic, the number of workers in conditions of high strain (high demands but low control) has doubled, while in the case of insecurity there are also increases, although not so pronounced, of around 6–7% in terms of fear about not finding another job or about a decrease in wages, which were already very high in 2016, the result of a context of high insecurity that can almost be considered a characteristic feature of the Spanish labour market (Sora et al., 2014). In contrast, there is a decrease in concern over job loss of more than 15%. As observed in 2010 in the context of the financial crisis (Utzet et al., 2014), part of this decrease could be due to the fact that part of the most vulnerable group (young people and temporary workers) would have already been expelled from the labour market when the survey began, a few weeks after the state of alert was declared, leaving the “survivors”, typically workers with more stable jobs. Another part could be due to the application of temporary lay-off procedures by the administration and the requirement for companies adopting this measure of not firing anyone during the six months following its termination (requirement that was relaxed for ERTes implemented after June 30 and which does not affect our sample). In addition to “classic” job insecurity regarding employment or its fundamental conditions, a majority (seven out of ten workers), express uncertainty and concern related to the possibility of becoming infected in the workplace or being themselves a transmission vector.

The worsening of workers’ health is considerable: more than a third of the salaried population affirms that their general health status worsened during the pandemic (only 5.2% stated that it improved); the use of tranquilizers and opioid analgesics more than doubled compared to the pre-pandemic situation and, in addition, a very significant percentage of those who were already users increased the dose or switched

to a stronger drug; on the other hand, in the ERP-2016 it was estimated that the percentage of subjects who reported often or almost always sleeping badly in the last month was 12.3% (Salas-Nicás et al., 2020) and those who were at risk of poor mental health 23.7% (Salas-Nicás et al., 2018). This means that workers with very frequent sleep problems have almost quadrupled compared to 2016 and those at risk of poor mental health have more than doubled. This worsening in poor mental health in the context of the COVID-19 pandemic is due to multiple causes. Among work-related causes will surely be the increase in exposure to high strain (Harvey et al., 2017), uncertainty related to job insecurity and financial concern (Wilson et al., 2020), fear of becoming infected, etc., but also the increase in social isolation and loneliness (Holmes et al., 2020). In any case, it is evident that if this situation continues over time, the damage to the health of workers may be very significant.

Although for the set of indicators studied the level of harmfulness is generally high, there are also considerable inequalities: manual workers, women, young people and those with lower wages are undoubtedly worse off. As in the 2008 crisis (Utzet et al., 2015), manual workers, occupations less prepared for teleworking and many “front-line” workers face the high demands deriving from staff cuts, from shortcomings in technologies and processes aggravated by the pandemic, or are unable to influence their daily work situation due to the authoritarian or neo-Taylorist forms of work-organisation that characterise Spanish labour management practices in this segment of workers (Llorens et al., 2019).

Young people, already with the highest levels of precariousness and suffering the attendant job insecurity and job destruction, are probably the main victims of the pandemic from an occupational point of view, since they run the risk of their entire working life being affected by the current situation, becoming “the lockdown generation” (ILO, 2020). In addition to the usual unfavorable situation of women, the pandemic has a high feminization of many of the so-called “front-line” occupations (Wenham et al., 2020), which have been more exposed and have suffered more intensely from the effect of working in very stressful conditions, with high quantitative demands and with a higher probability of being infected. Salary is also revealed as a powerful axis of inequality, being strongly associated with most of the items studied, for example, going to work with symptoms compatible with COVID-19, which surely indicates that for many people staying home is not an option, for economic reasons. Moreover, other studies have shown the vulnerability of other occupational groups, for example migrant workers, many of them employed in low-skilled occupations and with poor housing conditions (Koh, 2020).

This study has certain limitations, mainly related to data collection procedures. It is obvious that in the face of such an unexpected situation as the COVID-19 pandemic, many studies have been done opportunistically without detailed planning. In our case, the information was obtained through an online survey, so that representativeness of the sample cannot be ensured, possibly suffering a selection bias, with those most affected by the pandemic being more likely to participate. In this sense, the authors took certain measures: first, the sampling distribution of sex, age and occupational groups was weighted according to the population structure of the reference survey in Spain (EPA), as well as by territorial distribution (autonomous community); second, a sensitivity analysis was carried out considering that the response rate of health personnel (presumably more motivated to respond due to their central role in the pandemic) was half that actually obtained.

This analysis detected irrelevant differences showing that, if it really existed, the selection bias would not act in this sense; third, of the results obtained here several are consistent with those from other sources: for example, at the end of April it is estimated that the total number of workers in a situation of ERTE stood at 3.4 million, approximately 27% of all employees, very similar to our figure of 26.2%; or those of the first published results of a Eurofound survey (Eurofound, 2020) in which it is stated that in Spain 30.7% of workers carried out telework, almost identical to our figure of 30.1%.

In contrast, a main strength of this study is the sample size, more than twenty thousand responses with representation of all possible profiles of workers according to gender, age, occupational group or territory. As a comparison, the Eurofound survey cited in the previous paragraph (Eurofound, 2020) produced its first wave report using a total of $n = 3064$ Spanish participants (Ahrendt et al., 2020). Our survey provides unprecedented and highly relevant information regarding the working conditions and health of workers resident in Spain at an absolutely exceptional moment, with the use of some previously used and validated questionnaires that allow a consistent comparison of the current situation compared to the recent past.

5. Conclusions

The results presented here paint a very worrying picture of the situation of working conditions and the state of health of workers residing in Spain, during the most intense phase of the pandemic. In general, we observe harmful working conditions and health indicators with very important deterioration compared to available references. And if the overall situation seems bad, in certain groups it is even worse. Thus, the COVID-19 pandemic may have exacerbated inequalities in working conditions and health in terms of class, gender, or age. In the future, once the pandemic has been overcome, the worsening of these conditions should be reversed and the extent to which it returns to the previous situation should be evaluated, since it would be very disturbing if both the working conditions and health of workers were to remain significantly worse than before the pandemic.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

- Ahrendt, D., Sandor, E., Leončikas, T., Wilkens, M., Mascherini, M., 2020. Living, working and COVID-19: Methodological note of Wave 1. European Foundation for the Improvement of Living and Working Conditions, Dublin.
- Bambra, C., Riordan, R., Ford, J., Matthews, F., 2020. The COVID-19 pandemic and health inequalities. *J. Epidemiol. Community Health* 74, 964–968. <https://doi.org/10.1136/jech-2020-214401>.
- Burdorf, A., Porru, F., Rugulies, R., 2020. The COVID-19 (Coronavirus) pandemic: Consequences for occupational health. *Scand. J. Work. Environ. Heal.* 46, 229–230. <https://doi.org/10.5271/sjweh.3893>.
- Burr, H., Berthelsen, H., Moncada, S., Nübling, M., Dupret, E., Demiral, Y., Oudyk, J., Kristensen, T.S., Llorens, C., Navarro, A., Lincke, H.J., Bocérán, C., Sahan, C., Smith, P., Pohrt, A., 2019. The Third Version of the Copenhagen Psychosocial Questionnaire. *Saf. Health Work* 10, 482–503. <https://doi.org/10.1016/j.shaw.2019.10.002>.
- Eurofound, 2020. Living, working and COVID-19: First findings. European Foundation for the Improvement of Living and Working Conditions, Dublin.
- Harvey, S.B., Modini, M., Joyce, S., Milligan-Saville, J.S., Tan, L., Mykletun, A., Bryant, R.A., Christensen, H., Mitchell, P.B., 2017. Can work make you mentally ill? A systematic meta-review of work-related risk factors for common mental health problems. *Occup. Environ. Med.* 74, 301–310. <https://doi.org/10.1136/oemed-2016-104015>.
- Holmes, E.A., O'Connor, R.C., Perry, V.H., Tracey, I., Wessely, S., Arseneault, L., Ballard, C., Christensen, H., Cohen Silver, R., Everall, I., Ford, T., John, A., Kabir, T., King, K., Madan, I., Michie, S., Przybylski, A.K., Shafran, R., Sweeney, A., Worthman, C.M., Yardley, L., Cowan, K., Cope, C., Hotopf, M., Bullmore, E., 2020. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. *The Lancet Psychiatry* 7, 547–560. [https://doi.org/10.1016/S2215-0366\(20\)30168-1](https://doi.org/10.1016/S2215-0366(20)30168-1).
- ILO, 2020. ILO Monitor: COVID-19 and the world of work, Fourth edition. International Labour Organization, Geneva.
- ISTAS, 2020. Manual del método COPSOQ-Istas21 (versión 3) para la evaluación y la prevención de los riesgos psicosociales en el trabajo. Instituto Sindical de Trabajo, Ambiente y Salud, Barcelona.
- ISTAS, 2019. Exposiciones psicosociales laborales en España: una mirada de clase y de género. Instituto Sindical de Trabajo, Ambiente y Salud, Barcelona.
- Karasek, R., Baker, D., Marxer, F., Ahlbom, A., Theorell, T., 1981. Job decision latitude, job demands, and cardiovascular disease: A prospective study of Swedish men. *Am. J. Public Health* 71, 694–705. <https://doi.org/10.2105/AJPH.71.7.694>.
- Koh, D., 2020. Migrant workers and COVID-19. *Occup. Environ. Med.* 77, 634–636. <https://doi.org/10.1136/oemed-2020-106626>.
- Llorens, C., Navarro, A., Salas, S., Utzet, M., Moncada, S., 2019. For better or for worse? Psychosocial work environment and direct participation practices. *Saf. Sci.* 116, 78–85. <https://doi.org/10.1016/j.ssci.2019.02.028>.
- Plan Nacional sobre Drogas, 2018. Encuesta sobre alcohol y drogas en España (EADDES). Ministerio de Sanidad, Consumo y Bienestar Social del Gobierno de España, Madrid.
- Salas-Nicás, S., Moncada, S., Llorens, C., Navarro, A., 2018. Cognitive and Affective Insecurity Related to Remaining Employed and Working Conditions: Their Associations with Mental and General Health. *J. Occup. Environ. Med.* 60, e589–e594. <https://doi.org/10.1097/JOM.0000000000001448>.
- Salas-Nicás, S., Sembajwe, G., Navarro, A., Moncada, S., Llorens, C., Buxton, O., 2020. Job insecurity, economic hardship, and sleep problems in a national sample of salaried workers in Spain. *Sleep Heal.* 6, 262–269.
- Sample, S., Cherrie, J.W., 2020. Covid-19: Protecting Worker Health. *Ann. Work Expo. Heal.* 64, 461–464. <https://doi.org/10.1093/annweh/wxaa033>.
- Sim, M.R., 2020. The COVID-19 pandemic: Major risks to healthcare and other workers on the front line. *Occup. Environ. Med.* 77, 281–282. <https://doi.org/10.1136/oemed-2020-106567>.
- Sora, B., Caballer, A., Peiró, J.M., 2014. La inseguridad laboral y sus consecuencias en un contexto de crisis económica. *Papeles del Psicol.* 35, 15–21.
- Utzet, M., Moncada, S., Molinero, E., Llorens, C., Moreno, N., Navarro, A., 2014. The changing patterns of psychosocial exposures at work in the South of Europe: Spain as a labor market laboratory. *Am. J. Ind. Med.* 57, 1032–1042. <https://doi.org/10.1002/ajim.22334>.
- Utzet, M., Navarro, A., Llorens, C., Moncada, S., 2015. Intensification and isolation: Psychosocial work environment changes in Spain 2005–10. *Occup. Med. (Lond)* 65, 405–412. <https://doi.org/10.1093/occmed/kqv062>.
- Vilagut, G., Ferrer, M., Rajmil, L., Rebollo, P., Permanyer-Miralda, G., Quintana, J.M., Santed, R., Valderas, J.M., Domingo-Salvany, A., Alonso, J., 2005. El Cuestionario de Salud SF-36 español: una década de experiencia y nuevos desarrollos. *Gac. Sanit.* 19, 135–150.
- Wenham, C., Smith, J., Morgan, R., 2020. COVID-19: the gendered impacts of the outbreak. *Lancet* 395, 846–848. [https://doi.org/10.1016/S0140-6736\(20\)30526-2](https://doi.org/10.1016/S0140-6736(20)30526-2).
- Wilson, J., Lee, J., Fitzgerald, H., Oosterhoff, B., Sevi, B., Shook, N., 2020. Job Insecurity and Financial Concern during the COVID-19 Pandemic are Associated with Worse Mental Health. *J. Occup. Environ. Med.* 62, 686–691. <https://doi.org/10.1097/JOM.0000000000001962>.