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# Health outcomes and psychosocial risk exposures among healthcare workers during the first wave of the COVID-19 outbreak

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## ABSTRACT

**Introduction:** The aim is to describe the health and psychosocial risk factors of Spanish healthcare workers during the COVID-19 pandemic. **Methods:** A cross-sectional study by means of an online questionnaire (April–May 2020). The data comes from the database resulting from the COTS project “Working conditions, insecurity, and health in the context of the COVID-19 pandemic”. The sample consisted of 1989 health care workers. **Results:** Women, young people (doctors and nurses) and the middle-aged (assistants) had poorer health and greater exposure to psychosocial risks. Geriatric assistants were the most-affected occupational group. **Conclusions:** gender, occupation, and age are focuses of inequality in the exposure of health care workers to psychosocial risks.

## 1. Introduction

The current COVID-19 pandemic has significantly affected the working population, and especially healthcare professionals (HCPs) (Pearman et al., 2020), both in the performance of care tasks and their mental health (García-Iglesias et al., 2020). They have faced a great increase in demands in their work environment (Franklin and Gkiouleka, 2021), with qualitative and quantitative changes in their tasks. They were reorganized into care teams which did not take into account their speciality or previous experience, in order to dedicate themselves almost exclusively to treating COVID-19 patients. In the case of nurses, for example, they went from the care of post-surgical patients or chronically ill patients, to the care of critical patients on ventilation. In Spain, the urgent lack of personnel led to the voluntary incorporation of retired personnel and students in the last year of training in medicine and nursing, to support HCPs and lower their workload. The care pressure forced spaces conceived for other uses to be adapted, so that operating rooms were transformed to expand critical care units while hotels or sports halls were enabled as hospitalization units. The initial lack of protective equipment for workers and changes to usual work

added to and multiplied an unequalled overload of work (Falcó-Pegmenols et al., 2020; Rodríguez and Sánchez, 2020).

These conditions caused mental health problems in HCPs, who showed major depressive disorders (28.1%), generalized anxiety disorders (22.5%), panic attacks (24.0%), post-traumatic stress disorders (22.2%) and substance use disorders (6.2%) (Alonso et al., 2021). Suicidal thoughts and behaviour during the last 30 days were found in 8.4% of HCPs (Mortier et al., 2021b), well above the general population of Spain (4.5%) (Mortier et al., 2021a). Perceived stress increased or decreased depending on the epidemiological indicators of the pandemic (Romero et al., 2020).

The organization of work, globally and particularly for HCPs who are predominantly female, has undergone very significant changes during the epidemic. In general, there has been a significant deterioration in working conditions and an increase in inequalities according to the segregation of the labour market, with notable increases in the quantitative and emotional psychological demands of work (high amount of work in relation to the time available to do it thereby intensifying the work pace and extending the day, as well as working in emotionally charged situations) and a slight worsening in control over work (the

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autonomy of the worker) (Salas-Nicás et al., 2021). This has caused a notable increase in the number of workers with high job strain (those exposed to high demands and with low control) (Karasek, 1979), a situation that is strongly related to cardiovascular disease and poor mental health (Niedhammer et al., 2014). Likewise, the increased work pace has affected the support of colleagues and superiors (Billings et al., 2020) and conflict in the work-life balance, that is, the need to be at home and at work at the same time (Franklin and Gkiouleka, 2021). Finally, the increase in job insecurity, both due to losing work and seeing a reduction in wages (Salas-Nicás et al., 2021), has been compounded for the vast majority of workers by the insecurity of catching COVID-19 at work and of transmitting it to their home environment (Franklin and Gkiouleka, 2021; García-Iglesias et al., 2020).

Among the HCPs who provided care during the first wave and throughout the pandemic were: physicians, nurses, nursing assistants

and geriatric assistants; all of them professionals with different psychological demands and possibilities for control over their jobs. In Spain, medicine and nursing have their own competencies and autonomous roles, while the nursing and geriatric assistants basically carry out functions delegated by nurses. Medicine and nursing are official university degrees of 6 and 4 years respectively that are equivalent to levels 7 and 6 of the European Qualifications Framework (EQF); while the assistants have professional training qualifications of a medium degree of one academic year that are equivalent to level 3–4 of the EQF (Diario Oficial de la Unión Europea, 2017).

Although recent research has described the consequences of COVID-19 on the health of health workers, few studies contemplate social health personnel or exposure to psychosocial risks present during the first wave of the pandemic. As such, the purpose of this study is to describe the health and psychosocial risk factors of healthcare personnel

**Table 1**  
Survey questions used in this paper.

Subject	Variable	Answers	Source	
Socio-demographic	Sex	Male / Female / Others	Ad-hoc	
	Age in years	18–34 years / 35–49 years / ≥50 years	Ad-hoc	
	The current salary covers basic needs	Always or usually / Never or only sometimes	ERP-16	
	Dependents in their charge (<15 years and/or >70 years)	No / Yes	Ad-hoc	
Occupational	Type of contract	Permanent / Temporary	Ad-hoc	
	Teleworking	No / Yes, combined with going to the company / Yes, mostly	Ad-hoc	
	Type of company	Private / Public	Ad-hoc	
	Sector of work activity	Healthcare / Social healthcare	Ad-hoc	
	Occupation	Medical / Nursing / Nursing Assistant / Geriatric Assistant or Geriatrician	Ad-hoc	
	Face-to-face care	Yes / No	Ad-hoc	
	Job loss since the start of the state of alert	No / Yes, they fired me / Yes, they did not renew my contract	Ad-hoc	
	ERTE <sup>1</sup>	No / Yes, temporary reduction of workday / Yes, temporary redundancy	Ad-hoc	
Health	Sick leave	No / Yes, due to COVID-19 / Yes, due to close contact with COVID-19 / Yes, due to other causes	Ad-hoc	
	Change of pattern or start of use of tranquilizers drugs in the last 30 days	Yes / No	EDADES	
	Change of pattern or start of use of painkillers (opioid) in the last 30 days	Yes / No	EDADES	
	Bad quality of sleep	Never or only once / Sometimes / Often or always	COPSOQ3	
	Perception of health	Better / The same / Worse	Ad-hoc	
Psychosocial risk	Risk of poor mental health	Low risk / High risk	SF-36	
	Demands	High work pace	No exposure / Exposure	COPSOQ3
		High quantitative demands at work	No exposure / Exposure	COPSOQ3
		High emotional demands	No exposure / Exposure	COPSOQ3
		High level of conflict in work-life balance	No exposure / Exposure	COPSOQ3
	Control over work	Low influence at work	No exposure / Exposure	COPSOQ3
		Low possibilities for development	No exposure / Exposure	COPSOQ3
	Social support	Low social support from colleagues	No exposure / Exposure	COPSOQ3
		Low social support from superiors	No exposure / Exposure	COPSOQ3
	Insecurities	High insecurity about job loss	No exposure / Exposure	COPSOQ3
		High insecurity about finding a new job if the current one is lost (labor market insecurity)	No exposure / Exposure	COPSOQ3
		High insecurity over working conditions	No exposure / Exposure	COPSOQ3
Concern about becoming infected with COVID-19 at work		High / Low	Ad-hoc	
High demand and low control	Concern about infecting someone with COVID-19	High / Low	Ad-hoc	
	High strain	Yes / No	Estimated from the theoretical model	

<sup>1</sup> Temporary laying-off proceedings. In Spanish, Expediente de Regulación Temporal de Empleo (ERTE)

during the COVID-19 pandemic.

## 2. Method

### 2.1. Design and sample

Observational cross-sectional study. The data comes from the anonymized database resulting from the COTS project (Salas-Nicás et al., 2021), obtained through an online questionnaire available from April 29 to May 28, 2020. The questionnaire was addressed to the salaried population residing in Spain in work on 14 March 2020, coinciding with the start of the state of alert. The total number of participants was 20,328, recruited through snowball sampling. For this particular study, all workers whose occupation was doctor, nurse, nursing assistant and geriatric assistant, n = 1,989, were selected.

### 2.2. Instruments and variables

The questionnaire consisted of a total of 41 closed questions, combining *ad hoc* questions and others belonging to the following questionnaires: Spanish Psychosocial Risks Survey 2016 (ERP16) (ISTAS, 2019), third version of the COPSOQ-ISTAS21 (Moncada i Lluís et al., 2021), Health-related quality of life questionnaire in short format of 36 items (SF-36) (Vilagut et al., 2005) and Spanish Survey on Alcohol and Other Drugs (EDADES) (Plan Nacional de Drogas, 2019). The variables were distributed in the following sets: a) socio-demographic; b) occupational; c) related to health; d) related to psychosocial risk (Table 1).

### 2.3. Analysis

The prevalences of exposure to psychosocial risks and unfavourable health situations were estimated for each occupation, stratifying by sex, age, and according to the healthcare activity (face-to-face care or not). To contextualize the results obtained, they were compared with those of the set of wage earners in the COTS study (Salas-Nicás et al., 2021). The analysis was processed with the SPSS version 26.0 computer software.

### 2.4. Ethical considerations

The study was carried out following current laws and was approved by the Ethics Committee on Animal and Human Experimentation of the Autonomous University of Barcelona (CEEAH/5158).

## 3. Results

The selected participants were medical professionals (15.2%), nursing (22.3%), nursing assistants (37.0%), and geriatric assistants (25.5%). The selected sample was composed mainly of women (85.6%), 48.2% were over 50 years old and 38.4% were between 35 and 49 years old and they nearly equally carried out their work activities between the public sector (54.7%) and private, with 81.5% undertaking face-to-face care.

The HCPs showing the highest prevalence of health disorders and harmful exposures to psychosocial risks were women, young in the case of medical and nursing professionals (Table 4 and 5), and middle-aged in the case of nursing assistants and geriatrics (Table 6 and 7), the latter being the most affected occupational group (Table 3).

The results are presented below according to occupational group:

### 3.1. Medical professionals

The medical personnel who participated consisted mainly of women (65.6%). Of the total medical personnel, 57.8% were over 50 years old and 28.9% were between 35 and 49 years old, 74.2% carried out work activities in the public sector, 85.8% in health centres, 79.0% had a

**Table 2**

Percentages of occupations in relation to socio-demographic and occupational variables.

	Occupation			
	Medical (n = 302)	Nursing (n = 444)	Nursing assistants (n = 735)	Geriatric nursing assistants (n = 508)
Sex				
Male	34.4	16.9	9.5	7.1
Female	65.6	83.1	90.3	92.9
Age				
18–34 years	13.3	11.9	15.7	11.6
35–49 years	28.9	39.6	41.8	38.0
≥50 years	57.8	48.4	42.5	50.4
Salary covering basic needs				
Always / Usually	92.0	85.6	54.8	36.5
Never / Sometimes	8.0	14.4	45.2	63.5
Dependents in their charge				
No	67.9	63.3	59.3	63.2
Yes	32.1	36.7	40.7	36.8
Type of company				
Private	25.8	24.8	43.6	77.8
Public	74.2	75.2	56.4	22.2
Sector of work activity				
Healthcare	85.8	89.6	74.3	18.3
Social healthcare	3.3	5.6	24.5	71.3
Type of contract				
Permanent	79.0	73.9	60.2	76.6
Temporary	21.0	26.1	39.8	23.4
Teleworking				
No	59.6	83.3	95.4	95.3
Yes, combined with going to the company	23.2	6.8	1.6	2.2
Yes, mostly	17.2	9.9	3.0	2.6
Face-to-face care				
No	36.2	17.6	16.1	12.3
Yes	63.8	82.4	83.9	87.7
Job loss since the start of the state of alert				
Fired	0.7	0.2	1.9	1.8
Contract not renewed	0.7	1.4	3.5	3.3
ERTE <sup>1</sup>				
Reduced workday	2.3	1.6	0.8	0.0
Temporary redundancy	3.3	1.8	8.8	2.6
Sick leave				
Due to COVID-19	7.0	11.0	9.9	17.1
Due to contact with COVID-19	11.6	15.5	14.4	23.4
Other causes	4.3	7.4	9.4	10.4

<sup>1</sup> Temporary laying-off proceedings. In Spanish, Expediente de Regulación Temporal de Empleo (ERTE).

permanent contract, and 92.0% of the medical personnel affirmed that their salary allowed them to cover monthly expenses (Table 2).

Taken as a whole, in health aspects, it seems that there are no notable differences compared to the salaried population in Spain (Table 3). However, women and the youngest age group reported a greater deterioration in health. On the other hand, the professionals who cared for others in person had higher proportion of poor sleep quality and a high risk of poor mental health (Table 4).

In relation to exposure to psychosocial risks, medical staff were more exposed to high psychological demands (quantitative and emotional) and conflict in the work-life balance than the salaried population in Spain (Table 3), especially women and younger people. Low influence at work and high job insecurity were more prevalent in young people (less than 34 years old), while low development possibilities and low social support were more frequent among those more than 35 years old. The concern of becoming infected with COVID-19 and of transmitting it was greater among the youngest and those who cared for others in person (Table 4).

**Table 3**  
Percentages of health characteristics and exposure to psychosocial risks according to occupation and the salaried population in Spain.

		Medical (n = 302)	Nursing (n = 444)	Nursing assistants (n = 735)	Geriatric nursing assistants (n = 508)	General population
Health	Use of tranquilizers	22.3	29.9	25.4	25.1	21.5
	Use of painkillers (opioids)	7.4	13.6	21.4	24.7	18.7
	Sleep problems (many times/always)	44.9	49.8	55.5	56.8	41.6
	Perception of worsened health	40.4	45.4	51.8	46.6	36.6
	High risk of poor mental health	50.9	62.5	71.4	73.2	55.1
Psychosocial risk	High work pace	59.3	52.3	54.1	66.4	48.0
	High quantitative demands	61.4	40.4	32.1	32.7	42.5
	High emotional demands	91.4	89.8	86.6	94.1	67.0
	High work-life conflict	64.9	49.0	46.9	53.7	52.9
	Low influence at work	16.8	22.6	40.7	35.2	31.0
	Low possibilities for development	16.8	15.6	36.0	44.4	46.9
	Low social support from peers	32.2	30.7	37.3	48.8	42.0
	Low social support from superiors	42.4	54.4	63.0	65.8	53.8
	High job loss insecurity	15.9	18.2	33.8	34.5	42.8
	High labor market insecurity	31.8	35.9	60.1	67.7	75.8
	High working conditions insecurity	42.5	52.3	59.8	52.9	48.8
	High concern of becoming infected with COVID-19 at work	71.6	75.7	79.5	77.5	68.1
	High concern of infecting someone with COVID-19	75.5	87.6	85.9	84.4	72.5
	High job strain	28.4	29.7	56.3	63.0	44.1

**Table 4**  
Percentages of health characteristics and exposure to psychosocial risks in medical professionals.

		Sex		Age			Face-to-face care	
		Male(n = 104)	Female(n = 198)	18–34(n = 40)	35–49(n = 87)	≥50(n = 174)	Yes(n = 192)	No(n = 109)
Health	Use of tranquilizers	10.7	28.4	25.0	19.5	23.3	21.5	23.1
	Use of painkillers (opioids)	3.8	9.3	5.0	7.0	8.2	6.9	8.3
	Sleep problems (many times/always)	28.8	53.3	61.5	48.3	39.7	46.6	41.3
	Perception of worsened health	29.8	46.0	50.0	44.8	35.6	40.6	39.4
	High risk of poor mental health	37.3	58.6	71.4	56.6	43.3	53.6	45.5
Psychosocial risk	High work pace	49.5	64.2	73.5	67.9	52.2	63.9	51.0
	High quantitative demands	48.4	68.0	71.4	66.7	57.0	56.1	70.0
	High emotional demands	90.1	92.1	97.1	89.7	91.0	97.0	82.0
	High work-life conflict	56.8	69.0	84.8	76.6	55.0	64.6	64.9
	Low influence at work	13.2	18.7	22.9	15.4	16.4	16.3	18.0
	Low possibilities for development	17.6	16.5	2.9	20.5	17.6	16.9	17.0
	Low social support from peers	25.6	35.6	8.8	39.0	33.5	34.1	29.3
	Low social support from superiors	35.2	46.1	32.4	52.6	39.2	44.7	39.0
	High job loss insecurity	12.2	17.7	31.6	22.1	9.1	15.6	15.5
	High labor market insecurity	33.7	30.9	47.4	25.6	31.7	29.9	34.6
	High working conditions insecurity	41.8	42.9	51.4	48.8	37.6	47.5	33.7
	High concern of becoming infected with COVID-19 at work	71.3	71.8	76.3	69.8	71.3	81.1	54.3
	High concern of infecting someone with COVID-19	74.5	76.0	84.6	81.4	70.3	84.1	60.2
	High job strain	24.2	30.5	26.5	34.6	25.2	29.3	27.0

3.2. Nursing professionals

The nurses who participated were mostly women (83.1%). Of the total nursing personnel, 48.4% were over 50 years old and 39.6% were between 35 and 49 years old, 75.2% carried out work activities in the public sector, 89.6% in health centres, 73.9% had a permanent contract, and 85.6% of the nursing personnel affirmed that their salary allowed them to cover monthly expenses (Table 2).

Compared with the salaried population in Spain, the nurses had higher proportions of consumption of tranquilizers and a higher risk of poor mental health, as well as a worse perception of health and sleep quality (Table 3). In general, women, the youngest nurses, and those who cared for others in person reported greater deterioration in health (Table 5).

Regarding exposure to psychosocial risks, they were more exposed to high work pace, high emotional demands, and concern of becoming infected by COVID-19 and of transmitting it than the rest of the salaried population in Spain (Table 3). In relation to the exposure associated with

the demands of the job, it was the youngest and those in positions giving face-to-face care who showed the worst results. Low influence at work was more frequent in men, in those less than 34 years old, and in those who cared for others in person. On the other hand, low possibilities for development were more prevalent among those who did not care for others in person. Low social support from colleagues was more prevalent among men, those who were older, and those who did not care for others in person, while low support from superiors was more prevalent among women, the youngest nurses, and those who cared for others face-to-face. High job insecurity was more widespread among men and the youngest nurses (Table 5).

3.3. Professional assistant nurses

The assistant nurses who participated were overwhelmingly women (90.3%). Of the total assistant nursing personnel, 42.5% were over 50 years old and 41.8% were between 35 and 49 years old, 56.4% carried out work activities in the public sector, 74.3% in health centres, 60.2%

**Table 5**  
Percentages of health characteristics and exposure to psychosocial risks in nursing professionals.

		Sex		Age			Face-to-face care	
		Male(n = 75)	Female(n = 369)	18–34(n = 53)	35–49(n = 176)	≥50(n = 215)	Yes(n = 366)	No(n = 78)
Health	Use of tranquilizers	17.3	32.4	39.6	32.4	25.4	31.4	22.4
	Use of painkillers (opioids)	6.7	15.0	15.4	14.8	12.1	14.3	10.3
	Sleep problems (many times/always)	32.0	53.4	64.2	58.0	39.5	51.4	42.3
	Perception of worsened health	30.7	48.4	60.4	46.9	40.5	47.1	37.2
Psychosocial risk	High risk of poor mental health	50.7	65.0	73.6	69.6	53.7	64.6	52.6
	High work pace	43.5	53.9	71.7	52.3	47.7	55.1	37.5
	High quantitative demands	44.3	39.6	37.0	44.2	38.1	38.5	50.0
	High emotional demands	91.9	89.5	100	92.3	85.5	93.3	71.9
	High work-life conflict	45.0	49.7	72.1	53.6	40.0	50.9	38.7
	Low influence at work	27.9	21.7	26.7	25.7	19.4	24.6	12.5
	Low possibilities for development	19.4	14.9	17.4	12.9	17.3	13.5	26.6
	Low social support from peers	38.7	29.2	31.1	25.2	35.1	29.1	39.1
	Low social support from superiors	50.0	55.2	58.7	52.3	55.1	55.9	46.9
	High job loss insecurity	23.3	17.1	43.5	22.4	9.1	18.4	17.1
	High labor market insecurity	44.6	34.1	53.1	42.4	26.4	35.8	36.4
	High working conditions insecurity	57.7	51.2	62.5	61.2	42.4	54.0	44.4
	High concern of becoming infected with COVID-19 at work	78.4	75.1	76.0	75.7	75.6	80.2	55.1
	High concern of infecting someone with COVID-19	86.7	87.8	92.5	92.6	82.3	90.4	74.4
	High job strain	39.0	28.0	26.7	32.9	27.9	30.0	28.1

**Table 6**  
Percentages of health characteristics and exposure to psychosocial risks in nursing assistants.

		Sex		Age			Face-to-face care	
		Male(n = 70)	Female(n = 662)	18–34(n = 115)	35–49(n = 306)	≥50(n = 311)	Yes(n = 614)	No(n = 118)
Health	Use of tranquilizers	17.1	26.1	23.5	31.4	20.6	27.0	16.9
	Use of painkillers (opioids)	22.9	21.2	23.5	24.2	18.0	22.5	14.4
	Sleep problems (many times/always)	44.3	56.6	65.2	59.5	47.9	55.5	55.9
	Perception of worsened health	47.1	52.2	49.6	58.8	45.5	53.3	42.2
Psychosocial risk	High risk of poor mental health	60.9	72.4	70.5	75.4	67.5	72.4	65.8
	High work pace	46.6	55.1	58.0	58.2	49.4	55.6	45.5
	High quantitative demands	22.4	33.3	39.5	30.8	30.9	31.0	37.6
	High emotional demands	91.2	86.0	82.7	87.7	86.7	88.0	78.2
	High work-life conflict	31.0	48.6	53.1	49.1	43.2	47.4	44.6
	Low influence at work	31.6	41.6	28.4	43.4	41.8	40.5	41.4
	Low possibilities for development	34.5	36.2	28.4	33.6	40.2	38.6	21.6
	Low social support from peers	22.4	39.0	41.3	36.9	36.6	37.1	39.1
	Low social support from superiors	46.6	65.2	63.0	64.4	61.7	64.0	58.0
	High job loss insecurity	26.9	34.4	48.5	41.9	20.9	31.9	44.4
	High labor market insecurity	67.2	59.2	72.3	64.9	51.0	58.9	67.7
	High working conditions insecurity	52.4	60.5	60.4	64.7	54.9	58.2	69.4
	High concern of becoming infected with COVID-19 at work	82.1	79.2	79.2	82.5	77.0	79.8	77.9
	High concern of infecting someone with COVID-19	89.9	85.5	80.9	90.8	82.8	87.3	78.6
	High job strain	58.9	56.0	48.1	56.7	58.1	58.1	45.1

had a permanent contract, and only 54.8% affirmed that their salary allowed them to cover monthly expenses (Table 2).

Compared with the salaried population in Spain, they showed higher proportions of poor sleep quality, worse perception of health, and high risk of poor mental health (Table 3). In general, women, the age group 35–49 years, and those who cared for others in person reported the greatest deterioration in health (Table 6).

In relation to exposure to psychosocial risks, they were more exposed to high work pace, high emotional demands, low influence at work, low social support from superiors, high insecurity about working conditions, and concern about being infected by COVID-19 and transmitting it than the rest of the salaried population in Spain (Table 3). Exposure associated with work demands were more prevalent among women, with the high work pace and emotional demands being worse among those aged 35–49 years old and those who cared for others in person, while the highest quantitative demands and the most conflict in the work-life

balance was among the youngest. Low influence at work was higher among women who were older than 35 years of age. On the other hand, low possibilities of development were found most in those older than 50 years of age and those who cared for others in person. Low social support was more prevalent among women. High job insecurity was more widespread among those who did not care for others in person (Table 6).

### 3.4. Geriatric assistant professionals

The geriatric assistants who participated were mostly women (92.9%). Of the total assistant personnel, 50.4% were over 50 years old and 38.0% were between 35 and 49 years old, 77.8% carried out work activities in the private sector, 71.3% in social healthcare centres, 76.6% had a permanent contract, and 63.5% affirmed that their salary did not allow them to cover monthly expenses (Table 2).

Compared with the salaried population in Spain, they showed higher

**Table 7**  
Percentages of health characteristics and exposure to psychosocial risks in geriatric assistants.

		Sex		Age			Face-to-face care	
		Male(n = 36)	Female(n = 472)	18–34(n = 59)	35–49(n = 193)	≥50(n = 256)	Yes(n = 441)	No(n = 62)
Health	Use of tranquilizers	25.0	25.1	13.6	25.4	27.6	25.2	24.6
	Use of painkillers (opioids)	22.9	24.8	20.7	28.0	23.1	25.3	22.0
	Sleep problems (many times/always)	44.4	57.7	45.8	59.6	57.3	57.1	55.7
	Perception of worsened health	33.3	47.7	37.3	52.6	44.3	47.6	40.0
	High risk of poor mental health	71.4	73.3	78.0	71.8	73.0	73.5	73.8
Psychosocial risk	High work pace	60.0	66.9	62.5	63.5	69.8	68.8	45.5
	High quantitative demands	36.7	32.4	20.8	37.3	31.7	32.7	31.1
	High emotional demands	89.7	94.4	93.9	91.7	96.1	94.9	86.4
	High work-life conflict	53.3	53.7	47.8	61.9	48.5	54.2	48.9
	Low influence at work	46.7	34.4	27.7	36.7	35.8	36.3	28.9
	Low possibilities for development	40.0	44.7	30.6	48.2	44.4	44.0	44.4
	Low social support from peers	48.1	48.8	20.4	49.4	55.2	49.3	44.2
	Low social support from superiors	56.7	66.5	81.6	67.3	60.9	64.8	71.1
	High job loss insecurity	33.3	34.6	45.5	33.3	32.8	34.1	38.9
	High labor market insecurity	72.2	67.4	76.8	69.6	64.1	67.8	69.6
	High working conditions insecurity	42.9	53.7	63.6	53.9	49.3	52.9	50.9
	High concern of becoming infected with COVID-19 at work	74.3	77.7	67.3	78.0	79.4	79.0	66.1
	High concern of infecting someone with COVID-19	88.9	84.0	84.7	87.6	81.8	86.1	72.1
	High job strain	57.1	63.5	56.8	63.7	63.9	62.9	62.8

proportions of opioid use, poor sleep quality, worse perception of health, and high risk of poor mental health (Table 3). In general, women and the 35–49 age group reported the greatest deterioration in health, with more marked differences in self-perceived health and sleep problems (Table 7).

In relation to exposure to psychosocial risks, they were more exposed to high work pace, high emotional demands, low social support, and concern of becoming infected by COVID-19 and of transmitting it than the rest of the salaried population in Spain (Table 3). In relation to the exposure associated with the work demands and the lack of control over their work, it was women, those between the ages of 35 and 49, and those in positions giving face-to-face care who showed the worst results. Low social support is more prevalent among women, with colleagues being worse among older women, while superiors were worse among younger women. High job insecurity was more widespread among young female workers and, specifically insecurity referring to fundamental working conditions, among women (Table 7).

#### 4. Discussion

The objective of this study was to describe the health and exposure to psychosocial risks of healthcare personnel during the first wave of COVID-19. Geriatric assistants were the occupational group in a worse situation in terms of health and exposure to psychosocial risks. Women and those who cared for others in person reported worse results for all four occupational groups. However, according to age, the youngest group reported worse results for medical and nursing professionals, while the middle-aged group reported worse results for nursing assistants and geriatric assistants.

The results showed that HCPs reported poorer health outcomes and greater exposure to psychosocial risks (except for development possibilities and job insecurity) than the general salaried population. This is a result that has been seen previously in other epidemic outbreaks such as Ebola, SARS, or HIV, increasing the prevalence of anxiety, depression, acute stress, and post-traumatic stress in HCPs (Instituto Nacional de Seguridad y Salud en el Trabajo, 2020a). In addition, face-to-face care aggravates health since it increases by 1.5 times the probability of suffering from mental health problems (Alshekaili et al., 2020).

Exposure to high work pace or to high quantitative demands and high emotional demands are transversal in the four occupational groups studied and their prevalence is well above that of the rest of the salaried

population in Spain. The negative impact of COVID-19 in terms of illness would have multiplied the quantitative demands and work pace of the HCPs due to the disorganization at work because of changes in protocols, the lack of facilities, and the limited availability of both human and material resources (Franklin and Gkiouleka, 2021). All of this would have caused an overload of work that these professionals, mostly women, had to deal with, working quickly and intensifying the pace throughout the entire working day or with longer than usual working hours, eventually performing double shifts (Rodríguez and Sánchez, 2020). In turn, long hours and unforeseen changes to the working day would have generated exposure to conflict in the work-life balance, the synchronous demands of the work environment and the family environment, with strict time demands when there are dependents to be cared for as well (Peter et al., 2021). Pre-pandemic literature pointed out that excessive ratios (Shin et al., 2018) and understaffing (White et al., 2019) could be at the source of high quantitative demands and may also compromise preventive measures devoted to increasing job control (Cramer and Hunter, 2019) or social support (Billings et al., 2020). Literature has connected understaffing or excessive ratios with New Public Management and Lean management in healthcare and long-term care sectors (Eurofound, 2020), which also meant performance monitoring, leaving care tasks on the backbones of staff in terms of work intensification or unpaid overtime, undocumented but used to stretch resources in the context of many years of underfunding (Baines and Armstrong, 2019).

The pandemic represented a scenario of death never seen before in healthcare: high mortality and a dehumanized death or death unrelated to the family (Collado-boira et al., 2020; Falcó-Pegueroles et al., 2021). This multiplied the emotional demands in these four occupational groups, demands that could not be managed given the high workload due to the lack of personnel. High emotional demands are at the very nature of caring tasks and cannot be removed. However, understaffing characterizing the healthcare and long-term care sector before and during the pandemic entailed elevated patient-professional ratios and long-working hours, increasing exposure to emotional demands, and causing higher emotional exhaustion (Cramer and Hunter, 2019). Furthermore, given the lack of protective measures and the long hours of exposure, nurses, nursing assistants and geriatric assistants were concerned about becoming infected and transmitting COVID-19 to the family (Cho et al., 2021).

The higher prevalence of exposure to low levels of support from

superiors among nursing and geriatric assistants and low influence at work could be related to authoritarian hierarchical organizational structures, and command and control management styles in the healthcare and long-term care sectors (Baines and Armstrong, 2019; Cramer and Hunter, 2019). During the COVID-19 pandemic, some studies warned about how this management style enabled bullying in response to concerns about safety, and it understands labour risks as acceptable and work-intrinsic, thereby producing new intentions to leave the profession (Giorgi et al., 2020). Ineffective communication and non-continuous feedback and recognition from managers has been reported as impacting negatively in numerous studies (Billings et al., 2020).

The results of the study once again reveal gender, occupation, and age as focuses of inequality in the exposure of workers to psychosocial risks. The evidence shows that women have suffered a greater psychological impact (Bettinsoli et al., 2020; Di Tella et al., 2020; Esteban-Gonzalo et al., 2020; Luceño-Moreno et al., 2020; Pappa et al., 2020; Rossi et al., 2020; Dosil Santamaría et al., 2021). These gender differences could be due, among other reasons, to the adoption of the role of caregiver in the home that women assume and which they must balance with their employment, making them more vulnerable to situations of overload (D'ettorre et al., 2021). In addition to having occupations related to the care of life with low social prestige and that in those occupations, when there is the opportunity, men usually occupy management roles or perform more technological tasks and women continue with direct care of patients, or with more standardized and repetitive tasks (ISTAS, 2019).

With regard to face-to-face care, the occupational group and the lack of resources have acted as an important risk factor for health; this is not surprising given that during the first wave, PPE was lacking and the patients were very seriously ill requiring high levels of direct care (Falcó-Pegueroles et al., 2020). Occupations, carried out mainly by women, with a longer time of continuous direct care characterized by prolonged contact and high transfer of emotions, have been related to worse results in mental health (Carmassi et al., 2020). In this case, nurses and first-line assistants provide direct care to patients 24 h a day (Gomes Fernandes et al., 2021). It should be noted that care, which per se is associated with women, is not exempt from hierarchies either, so that assistants (nursing or geriatric) with tasks delegated basically by the nurse or the doctor may have performed more direct care, if necessary, especially in social health and end-of-life situations. The pandemic has aggravated the exposure to psychosocial risks of the assistants that, like any performed work, already had a low level of influence, low possibility of development, and low social support from colleagues and superiors given the lack of participation in the working methods that are applied and the context of low staff levels in which they usually work (ISTAS, 2019).

Regarding the differences associated with age, there is evidence that indicates the youngest professionals as the most vulnerable (Esteban-Gonzalo et al., 2020; Romero et al., 2020; Rossi et al., 2020), while other authors point to middle-aged professionals (AlAteeq et al., 2020; Santamaría et al., 2020). The lack of knowledge about COVID-19 of HCPs has been related with poorer health in the youngest professionals, since the older ones have more experience and are better prepared to combat the stress of the pandemic (D'ettorre et al., 2021). In the case of assistants, the age results could be explained by the characteristics of their group, since they are an occupational group with an average age around 50 years (Instituto Nacional de Seguridad y Salud en el Trabajo, 2020b). Even so, there is no evidence that can explain the differences according to this variable.

This is a study conducted during the first wave of COVID-19, coinciding with the period of household lockdown in Spain, so data collection was performed through an online questionnaire by snowball sampling. Therefore, the appearance of a selection bias is possible, although in the general study including all workers, sensitivity analyses were carried out that showed that, if it existed, this bias should not be

very relevant (Salas-Nicás et al., 2021). On the other hand, the study does not intend to generalize its results to the healthcare or social healthcare sector, but rather studies four (social) healthcare occupations in a particular way. Furthermore, the fact that the sample used here was selected from COTS, which covered the entire salaried population, means the questions about health and employment conditions of workers were not specific to the health field.

There are no references regarding the assistants either because since they are not university graduates they do not carry out research and nursing research has not highlighted their work, or because in certain literature everybody is called a nurse without distinguishing between the two occupations. For this reason, we would highlight that the different naming systems for these occupational groups according to country complicates comparability between studies.

## 5. Conclusions

The results show a view of the health status and working conditions of HCPs in Spain during the first wave of COVID-19. In general, a great deterioration in the health and working conditions of HCPs was observed compared to the general salaried population. In addition, gender, age, and face-to-face care related to ongoing care were associated with poorer health and greater exposure to psychosocial risks. Among the four occupational groups, the geriatric assistants were the group with the most severe results. The COVID-19 pandemic appears to have further aggravated the pre-existing inequalities between occupation, gender, and age.

Organizational measures should be restructured and strategies should be created to improve working conditions in order to reduce work demands, as well as inequalities between occupational groups and gender, to avoid associated comorbidities. Quantitative demands, emotional demands, social support, and insecurity due to the possibility of being infected with COVID-19 and transmitting it to family members have been the exposures to psychosocial risks which have been most exacerbated.

The Trade Union Institute of Work, Environment and Health (ISTAS) published a guide (Andrés et al., 2015) with guidelines and preventive measures that help reduce and/or eliminate exposure to psychosocial risks. ISTAS proposes adapting the amount of work to the amount of time in the day for the quantitative demands, in addition to ensuring sufficient staff to cover all needs. For this, it would be necessary to record the workloads of the personnel and plan the assignment of tasks so that the work fits the day and/or allocate more resources when the tasks exceed the time stipulated. In the case of the emotional demands, inherent to this occupation, they cannot be eliminated or reduced at source. Therefore, it would be advisable to reduce exposure time and develop protection measures focused on the individual, such as training for the acquisition of knowledge, strategies, and skills to improve coping. For increased social support, relationships should be fostered through teamwork. To reduce insecurities regarding COVID-19 infection and transmission, the authors propose that companies should ensure safety by providing protective materials, and screening and diagnostic tests.

Qualitative research is needed to explore in depth the processes from which these factors (gender, age, and occupation) are associated with poorer health and greater exposure to psychosocial risks. In addition, studies are also needed that quantify emotional work, which the pandemic has aggravated.

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