



# The Psychological Impact of COVID-19 Pandemic on Health Care Workers in Pontevedra (Spain)

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## ABSTRACT

The COVID-19 pandemic has exposed health care workers (HCWs) to increased workload and high risk of contagion with a negative impact in their mental health. We present a descriptive and observational study performed with a total sample of 306 healthcare workers (HCWs) in the Pontevedra Area, which include two Hospitals: Hospital do Salnés and Hospital Clínico-Universitario de Pontevedra and Primary Care Health Centers (“Centros de Saúde”: CS and AP, “Puntos de Atención Continuada”: PACS) from 3th to 16th May 2021.

**Aim:** To study the psychological impact in healthcare workers in our community, (Pontevedra, 300000 inhabitants).

**Method:** An online massive survey was administered with “Google Forms”. We performed a battery of sociodemographic and work conditions questions, medical history, psychiatric drugs consumption, substance use, personality test (Salamanca Personality test), SCL-90-R (depression and anxiety subscales) and perceived stress scale (PSS-10). Respondents were 306 HCWs (80.4% women; 19.3% men, 1 non-binary)

**Results:** We find that 22.4% of HCWs present high perceived stress, 85.7% have sleep problems and 20.6% are using psychiatric drugs (either anxiolytics or antidepressants). 65.5% of HCWs on psychiatric medication recognize the need to increase doses during the pandemic. Besides, 12.1% has started taking antidepressants. We find an increase in alcohol and tobacco use. The fear to infect family, the front-line professionals and the extreme working conditions (work overload and the feeling of having few means and little support available) are the main variables that impact the mental health of HCWs during the pandemic. The personality traits shape coping strategies. The highest perceived stress happens in HCWs working in Primary Health Centers (especially those that work in both places: hospitals and Primary Health Centers).

**Keywords:** Healthcare workers; Pandemic; COVID-19; Mental health; Stress; Observational study

## INTRODUCTION

According to the literature, the ongoing pandemics have had a negative impact on mental health of the general population [1-10]. Health care workers, adolescents and young people are among the population with higher levels of stress [11,12].

Adolescents have suffered the lockdown and the social distancing and face a very uncertain future. HCWs and front-line workers are still emotionally and physically exhausted. Countries across the world applauded their essential workers, but once the clapping stopped, HCWs were left facing difficult work conditions, lowered

quality health care and their own health problems. It is time to talk about a silent pandemic: mental health.

Work in healthcare often involves stressful and emotional situations in caring for those who are sick, unique pressures from relationships with the patient, family members and also the health administration. The COVID-19 pandemic has introduced additional elements of stress in health workers [2,7,8,10,13]. Over the last years, the establishment of health systems providing universal coverage in the most advanced European countries has contributed to permanent improvement in many health indicators like population health status parameters, health care amenable

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outcomes, coverage, access and financial equity parameters, health care quality, user satisfaction, and a public health system that is highly regarded by the population it serves.

But public health systems are highly political and often, key decisions that impact health outcomes are not always made by health professionals. In Spain, HWCs work in a system that was already weakened before the pandemic: Cuts in economic resources, the privatization of services and the deterioration of the working conditions have put many Spanish regions in precarious positions in the face of COVID-19. The impact of the pandemic crisis has provoked a great negative impact in human resources affecting the physical and mental wellbeing: Most of the studies show an increase of psychopathology in healthcare professionals (specially the front-line workers) with high prevalence of depression, anxiety, stress, insomnia and substance consumption [4-6,10,13-18].

One of the first studies of the psychological impact of COVID-19 on healthcare workers were carried in Xi'an Center Hospital [3]. Results showed that anxiety and depression were prominent among healthcare workers, in addition, emotional distress was also higher among those who believed "the epidemic has changed personal or family lifestyle". Other studies revealed that healthcare staff that lived with someone with a chronic disease had the greatest levels of anxiety [7,15]. Sleep problems, anxiety and depression were the most frequent psychopathology among healthcare workers but we find studies with new onset of autolytic ideation [6]. Among the risk factors with higher levels of psychopathology are gender (women), lack of experience, living with vulnerable people, having a chronic disease or working in the front-line (direct contact with infected people) [6,19].

## MATERIALS AND METHODS

We present a descriptive and observational study performed with a total sample of 306 healthcare professionals in the Pontevedra-Salnés Public Health area (which include two Hospitals and 33 Primary Care Health Centers) during May 2021 (Figure 1): population 300,000. Participants answered an anonymous questionnaire previously approved by the Ethic Committee. Data was gathered *via* corporative mail. A Google form was prepared including socio demographic and occupational data, as well as medical

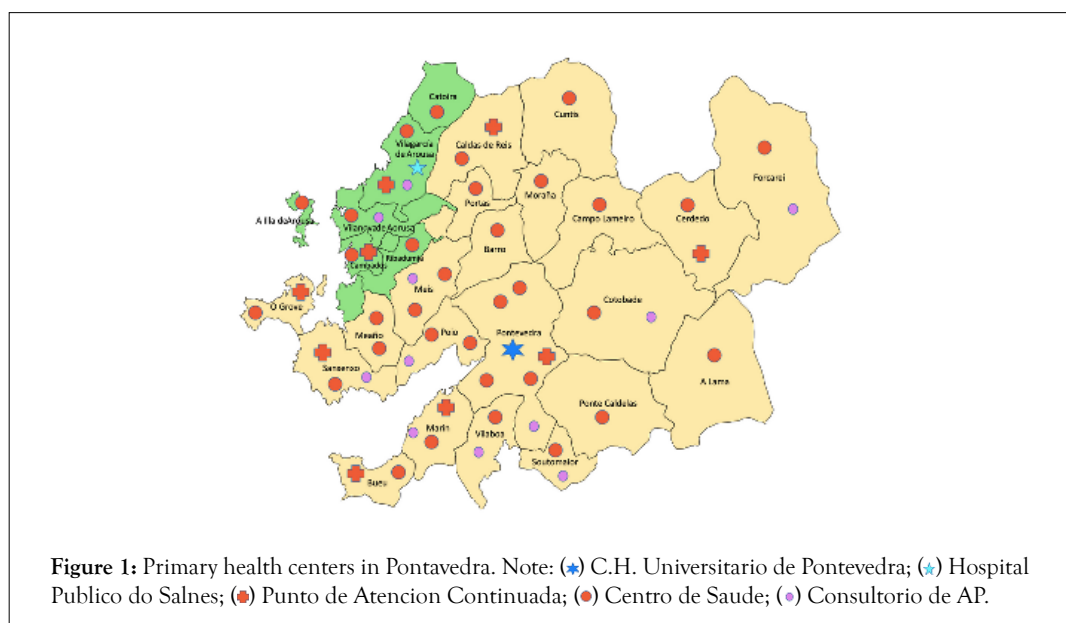
history, substance use, personality test (Salamanca Personality test) perceived stress scale (PSS-10) and depression and anxiety subscales of SCL-90-R. The participants were active professionals of all kinds including doctors, nurses, nurse's aides, porters, ward clerks, social workers, pharmacists and patient care technicians. Our sample is the 8% of the total professionals in the area and it is very similar in distribution to the total of health workers in our Region: 80.4% are women and 19.3% are men; one individual declined to self-define gender. The age distribution is homogenous with 24.8% under 35; 20.3% between 35 and 45; 20.3% between 46 and 55 and 31% older than 55. We find a 15.4% of workers with chronic medical pathology.

A questionnaire was designed containing socio-demographic data (gender and age) and questions about marital status, cohabitants, position, work contract, front-line (direct contact with infected patients), place of work (hospital *vs.* primary care center), work conditions, health status, toxics use (alcohol, tobacco) or anxiolytics medications.

The study received the approval of the Ethic Committee of the "Hospital Clinico-Universitario de Pontevedra".

## Questionnaires

- **Perceived Stress Scale (PSS-10):** an instrument to identify stress. It consists of 10 questions about feelings and thoughts during the last month. The answers to each question are on a 5-rate scale, ranging from never to very often. Scores ranging from 0 to 13 are considered low stress. Scores 14-26 are considered moderate stress. Scores between 27 and 40 are considered high perceived stress [20-22]. The cut-off point >20 was used as a reference of high stress perceived [23].
- **Salamanca screening questionnaire is used to explore 11 personality traits [24]:** anankastic, anxious, histrionic, schizoid, impulsive, borderline, dependent, paranoid, antisocial, narcissistic, schizotypal.
- **SCL-90-R (depression and anxiety subscales):** self-report symptom inventory developed by Leonard Derogatis in mid-1970s [21,24,25] and additional items: Poor appetite, trouble falling sleep, thoughts of ending life, disorderly eating, awakening early in the morning, sleep that is restless or disturbed and feelings of guilt.



## Data management

All data were entered in SPSS V. 23.

Spearman's correlation coefficient was used to study the strength of the association between different scores. Chi-squared ( $\chi^2$ ) test and Fisher exact-test can be used when you have categorical data, they can assess for independence between two variables when comparing groups are independent and not correlated, for example working position, work overload, level of information and the socio demographic variables. Fisher exact-test is used when more than 20% of cells have expected frequencies  $<5$ , we need to use Fisher's exact test because applying approximation method is inadequate; for example, start antidepressants and front-line workers. Kruskal-Wallis H test is used to determine if there are statistically significant differences between two or more groups of an independent variable on a continuous or ordinal dependent variable (fear of infecting and PSS-10).

## RESULTS

### Perception of working overloads and work conditions during pandemic

80.7% of HCWs are overwhelmed by work, 62.7% feels a deterioration of working conditions and 62.7% refer a work overload. PSS-10 is statistically higher among those that perceive work overload. The perception of working overload is statistically associated to suffer anxiety crisis ( $\chi^2$ ;  $p<0.0001$ ).

### Level of information received

34.1% refer to receive poor information, 32.1% refer to receive adequate information and 32.1% refer to be overinformed.

### Front-line HCWs

Front-line HCWs obtain the highest score perceived stress.

Fisher's Exact test determine the association between front-line workers and anxiety crisis ( $p<0.00001$ ), the perception of working overload ( $p<0.00001$ ), the start on antidepressants ( $p<0.0001$ ) and the increase in anxiolytic consumption ( $p<0.0001$ ).

### Work place

PSS scores are higher among the HCWs that work in both places: Primary Health Centers and in Hospitals followed by the HCWs in Primary Health Centers and lower scores in those that work only in Hospitals ( $\chi^2$ ;  $p=0.004$ ).

### HCWs living with a vulnerable person

Kruskal-Wallis H test is used to determine if there are statistically significant differences between two or more groups of an independent variable on a continuous or ordinal dependent variable (fear of infecting and PSS-10). There are statistically differences: living with a vulnerable person (fear to infect) is associated to PSS-10 higher scores.

### HCWs with medical conditions

There are not statistically differences (Kruskal-Wallis) between PSS-10 and suffer a medical condition among the HCWs.

### Substance use in healthcare workers

17.3% are smokers (and 40% recognize increased consumption with the pandemic). 28.1% are drinkers (and 27.75% recognize increased consumption with the pandemic). Higher PSS-10 scores

do not correlate with the increase in alcohol and tobacco use. The narcissistic personality trait is statistically linked to alcohol use ( $\chi^2$ ;  $p=0.0026$ ).

### Psychiatric drugs consumption

20.6% are on medication anxiolytics and antidepressants (63.55 recognize having higher doses with the pandemic). 12.1% have started antidepressants during the pandemic. Fisher's Exact test determine the association between front-line workers and the start on antidepressants as significant ( $p<0.0001$ ).

### Anxiety and depression (subscales SCL-90-R)

As we can see (Table 1) there is a correlation (Rho Spearman) between PSS-10 and depression and anxiety symptomatology.

**Table 1:** Spearman correlation and significance factors.

PSS-10 variables (Spearman correlation)	Correlation rs	Significance
Work overload	0.253**	0.000
Risk of infection	0.109	0.056
Worry	0.185**	0.001
Fear to infect	0.257**	0.000
Depression	0.848**	0.000
Anxiety	0.806**	0.000
Insomnia	0.635**	0.000

**Note:** \*0.05 (bilateral), \*\*0.01 (bilateral).

### Personality traits

85% of the sample show is positive to, at least, one personality trait.

The personality traits that appeared were: Anankastic (52.9%), anxious (44.5%), histrionic (38.2%), schizoid (37.3%), impulsive (29.7%), borderline (26.5%), dependent (25.8%), paranoid (15%), antisocial (6.9%), narcissistic (5.9%), schizotypal (3.9%).

The personality traits that correlate (Rho-Spearman) more with the PSS-10 and insomnia are the anxious, borderline and impulsive (Table 2). According to Rho Spearman analysis all the personality traits correlate autolytic ideation, work load and fear to infect vulnerable family with the exception of narcissistic and antisocial personality traits (Table 2).

**Table 2:** Correlation insomnia and personality traits.

	PSS-10		Insomnia	
	Correlation coefficient	Bilateral significance	Correlation coefficient	Bilateral significance
Paranoid	0.281**	0.000	0.248**	0.000
Squizoid	0.228**	0.000	0.116**	0.004
Histrionic	0.222**	0.000	0.236**	0.000
Antisocial	0.096	0.094	0.035	0.54
Narcissistic	0.072	0.208	0.147*	0.01
Impulsive	0.346**	0.000	0.295**	0.000
Borderline	0.428**	0.000	0.267**	0.000
Anankastic	0.148**	0.000	0.208**	0.000
Dependent	0.268**	0.006	0.158**	0.006
Ansioux	0.339**	0.000	0.323**	0.000

**Note:** \*Correlation significance 0.05 (bilateral), \*\*Correlation significance 0.01 (bilateral).

### Anxiety crisis

35.6% have suffered anxiety crisis during the last month. The perception of working overload is statistically associated to suffer anxiety crisis ( $\chi^2$ ;  $p < 0.0001$ ).

### Trouble falling sleep

85.7% of the sample recognizes problems falling sleep.

There is a correlation (Rho-Spearman) between PSS-10 scores and trouble falling sleep (Table 1).

### Autolytic ideation

14.4% have been thinking about killing themselves. There is statistically significant relationship ( $\chi^2$ ) between suicidal ideation and the medical vulnerability to COVID ( $p = 0.009$ ) or living with someone vulnerable ( $p = 0.038$ ). There is not statistically significant relationship ( $\chi^2$ ) between suicidal ideation and working in front line or sex.

### Perceived Stress Scale (PSS-10)

Scores ranging from 0 to 13 are considered low stress. Scores 14-26 are considered moderate stress. Scores between 27 and 40 are considered high perceived stress.

In our sample the average score is 19.7 with a standard deviation of 6.7. 22.4% of the sample have a score  $\geq 20$  which high stress perceived.

More work overload is associated with higher PSS-10 scores.

## DISCUSSION

This study was designed to investigate the impact of COVID-19 on mental health among healthcare workers during the COVID-19 pandemic. There are many studies about the impact of psychological stress in health professionals during the pandemic; but not many take in consideration the personality traits. Life stress often combines exponentially with personality measures to predict variance in adjustment scores [22]. The same stressor will vary across individuals and a key factor is the individual's perception of his or her ability to control de source of stress [22]. The PSS appears to represent a good scale because this measures not dependent on endorsements of specific events but, rather, on the degree to which individuals experience their lives as unpredictable, uncontrollable or overloading. The combination of these measures (PSS, Personality test and psychopathology) and the substance use and psychiatric drugs consumption result in a powerful view of the impact of pandemic in HCWs.

Data shows high level of perceived stress among HCWs. They feel overwhelming and most of them refer an overload work. 22.4% suffer intense stress (PSS-10 over 20). These levels are under the results obtained in other similar studies [7], although they are superior to the ones publish in other countries [3]. This difference can be due to differential working conditions, cultural and sociological differences in the expression of psychological distress and different ways of measure.

We find that HCWs that work in two places (Primary Health and Hospital centers) are the most stressed (correspond to HCWs doctors in training, or doctors and nurses with poor working conditions and instability). Followed by the Primary Health Center workers who were overwhelmed even before the pandemic crisis and, at the same time, they are the front-line

workers and the professionals who deal with infected patients or patients not already diagnosed.

The fear to infect family members is higher than to get infected themselves and this is a repeated finding in other studies [7].

The PPS-10 correlate with autolytic ideation Increased toxics consumption is more important than in other studies [3] and similar to general Spanish population. Toxic use (alcohol and tobacco) was increased in a similar way that happened during the lockdown in general Spanish population [13], but in HCWs this fact lasted longer and in general population was coincident with the lockdown and limited in time. Psychiatric drugs are prescribed fourfold than in general population; almost two thirds were previously on these drugs (Table 3). This data, which has not been published before, shows that this profession is chosen by anxious people (we find anxious, dependent and borderline traits among the psychiatric drugs users) but it could also be a consequence of working in difficult conditions and the overload work that HCWs must cope with (psychiatric drugs use are increase in PSS-10 higher scores).

**Table 3:** Compared general Spanish population and sample of HCWs-pontevedra increasing in compsumtion.

	HCWS-Pontevedra	Spanish population a
Tobacco	39.62%	42%
Alcohol	27.75%	26.4%
Psychiatric drugs	63.7%	22.1%
	12.1% antidepressivos (new)	

<sup>a</sup> Balluerka, et al. (2020).

We do not find statistically differences between stress, age, gender and work position. However, we find a tendency that, as the other studies [7] refer, greater risk to be more stressed in younger ( $<30$ ) and older workers ( $>55$ ), women, living with vulnerable people and with overwhelming feelings due to the increased workload.

The strengths of this study are the inclusion of psychopathological variables pre-pandemic (like personality, psychiatric drugs or toxics use) and see how the pandemic stress and the environmental factors linked to work and family affect HCWs in an extraordinary situation.

In our country, wellbeing and equity depends upon a strong healthcare system and the HCWs who maintain it; so, their wellbeing plays an important role in maintaining a robust and sustainable Health system [26,27].

We want to better understand the factors linked to stress in HCWs. They sustain the system that provides universal coverage for all residents, it is free of charge to anyone living and working in Spain, and accounts for around 9% of annual GDP. Spanish population is considered among the healthiest in the word, with the highest life expectancy is the highest in the European Union. Health is a strategic sector for any advanced society. Investment in Health produces both economic and health benefits. Worldwide, the investments in Mental Health are scarce. But studies say that every dollar invested in treating depression and anxiety leads to a return of four dollars (26). Our study finds high prevalence of psychopathology among the front-line workers, work overload conditions, primary health centers workers, living with vulnerable and fear to infect.



## CONCLUSION

The COVID-19 pandemic is a healthcare crisis that has led to unprecedented impact on healthcare services. Studies show high rates of psychological impact; anxiety, sleep problems, autolytic ideation and stress were significantly increased. Stress is an important factor in drug use. HCWs are living an emotional exhaustion experience. The ability to cope with stressors is important to their patients, families and themselves. Efforts should be made to explore factors associated with psychological distress. HCWs should be encouraged to use both personal and professional support systems and other measures should be implemented, such as improved training periods and work conditions.

## LIMITATIONS

The first one is the size sample that correspond 8% of the total HCWs in the area, besides 80% are women (which reflects a real distribution between HCWs in our area), so it is very difficult to establish differences based in gender. We do not have enough samples to categorize by professional category, overrepresented nurses and doctors in training and less nurse's aid, porters, laboratory professionals or clerks. The questionnaire took 15 minutes to cover but it was important some Informatics knowledge.

There are many reasons individuals might offer biased estimates of self-assessed behavior, ranging "to look good" or "to be concerned about the subject": more stressed professionals can be more interested in answering and probably with greater mental health awareness. HCWs clinically affected in situation of temporary incapacity for work due to medical or psychiatric diagnosis do not appear represented, because in these cases people are less likely to check their email. Only active workers appear in our sample.

## DECELERATION

Ethics approval and consent to participate: Approved by Ethic Committee of Hospital Clinico-Universitario de Pontevedra (Supplementary information).

Consent for publication: Yes.

Competing interests: No.

Funding: No public or private funding.

Availability of data and materials: All data generated or analysed during this study are included in this published article and its supplementary information files and they are available to check.

## AUTHORS' CONTRIBUTIONS

- Study designers: Dr Vidal-Millares and Dr Alvarez-Perez.
- Questionnaire: Dr Alvarez-Perez and Carmen Mercedes Garcia-Hijano.
- Statistical: Dra. Vidal-Millares, Dra. Duran-Maseda and Dr. Vicente-Alba.
- Writing and discussion: Dra. Gago-Ageitos.

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