

# COVID-19 and anxiety amongst health professionals in prisons

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## ABSTRACT

**Objectives:** The main aim of this article was to analyze the emotional levels of anxiety amongst health professionals employed in prisons during the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) epidemic.

**Material and method:** This descriptive, cross-sectional study was conducted by means of a validated anxiety questionnaire answered by 100 clinical nurses and nursing assistants residing in Spain and working in prisons. Alongside the demographic information, the test included 14 items related to anxiety levels. The questionnaire turned out to be highly reliable after carrying out an analysis with a Cronbach's alpha of 0.935, demonstrating high reliability.

**Results:** Over one third of health participants presented severe anxiety levels, with a greater impact on women than on men. The situation in centers for the elderly appears to be more tense and complex than in prisons, although the latter are far more overcrowded. However, both institutions show common factors, such as the vulnerability of their populations and a possible explosive outbreak, which would exceed the resources available in such institutions.

**Discussion:** The significant levels of anxiety that nursing professionals showed in the study make it necessary to implement measures to avoid more serious future consequences in the medium and long term.

**Key words:** coronavirus infections; anxiety; prisons; homes for the aged; Spain.

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## INTRODUCTION

The COVID-19 pandemic has had a direct impact on the physical and mental health of health professionals, who are likely to develop disorders and even some pathologies in the medium and long term. Previous studies on epidemics and pandemics have shown that symptoms of stress, anxiety, depression and insomnia are the most notable effects on the mental wellbeing of health professionals. Therefore, it is not only necessary to detect these pathologies but also to treat them to prevent them from exacerbating and giving rise to new diseases amongst staff<sup>1,2</sup>.

Mental wellbeing is an integral part of health, according to the Constitution of the World Health Organisation (WHO). Nursing professionals are a

collective in the front line of action in the fight against COVID-19 and are exposed to critical, chaotic and mortal situations without sufficient training or equipment, which can lead to fatigue and uncertainty. Furthermore, many nursing professionals were subjected to emotional stressors and paid a high emotional price during the pandemic in their day-to-day activities, that affected their patients, their own lives and that of their families<sup>3,4</sup>.

The efforts of nursing professionals are a determining factor in many services and areas. They should therefore have scientific knowledge and humanisation skills, and possess good physical and mental health. In particular, analysis is being carried out on the impact of the pandemic on health professionals who work in prisons and residences

for the elderly, where long-lasting relationships with users are established and mini-societies are created<sup>5</sup>.

Institutions like these share specific characteristics, such as adaptation/socialisation, routinisation, separation and the creation of mini-societies. The pandemic affected closed centres where many persons with risk factors reside, and also increased restrictions and isolation from the outside world<sup>5</sup>.

The aim of this study is to analyse the emotional levels of anxiety amongst health professionals in closed institutions during the SARS-CoV-2 pandemic, since they may suffer levels of stress and anxiety over and above the levels that already exist. It is essential to care for their mental health, especially in settings such as the ones mentioned above, to guarantee high quality healthcare and ensure their physical and mental health.

## MATERIALS AND METHODS

A descriptive, cross-sectional study was designed for health professionals who work in Spanish residences for the elderly and prisons that housed patients from 24 June 2022 to 9 November 2022. The sample was made up of 90 persons who worked in public and private institutions.

The researchers used professional contacts to gather the sample, and the “snowball” technique was used, where each subject contacted was asked to propose new subjects who worked in closed institutions, and so on.

The criterion for inclusion was the health professional’s consent to participate in the study. The exclusion criterion was not completing the questionnaire.

The information was gathered by using the Hamilton Anxiety Rating Scale (HARS), validated for Spanish populations by Lobo *et al.*<sup>6</sup>, which measures anxiety. The total score for the different items in the HARS scale provides a total score that indicates the presence of anxiety disorders that may require treatment. The levels of anxiety are classified as follows: normal (up to 14 points), mild (15 to 17 points), moderate (18 to 24 puntos) and severed (scores of 25 and higher).

A section was also included to gather information about gender/age/profession.

The data was gathered with the Qualtrics online platform, which is a survey management system. The participants received the survey via electronic mail. The data obtained was compiled on an Excel spreadsheet and then purged before being exported to a statistical analysis program.

The Kolmogorov-Smirnov normality test was used to determine the normality of the quantitative variables of the sample. A descriptive analysis of the data obtained was carried out. The quantitative variables were expressed as means with the corresponding confidence intervals of 95%, percentiles of 25, 50 and 75, and minimum and maximum values.

Qualitative or categorical variables were presented as absolute, relative and accumulated frequencies. A frequency count per answer was carried out and the mean of the numerical value was used as a representative value, given that it was a sequenced numerical scale. A comparison of means was also applied to evaluate the heterogeneity in ordinal samples.

The data was analysed with classical statistical techniques. The means of the quantitative variables that followed a normal distribution with the Student *t* test were compared in the comparative bivariate analysis. The categorical variables were compared using the Pearson  $\chi^2$  test or the Fisher exact test in cases where the observations were under 5. Binary logistical regression models in which the place of work as a variable dependent were used, and the variables that showed statistical differences in the classical comparison were used as independent variables.

A statistical significance of under 0.05 was adopted in all the cases. The IBM Statistical Package for The Social Sciences (SPSS) v.24 was used for the statistical analysis of the variables.

Ethical considerations were applied. An informed consent form was prepared, accompanied by information that the respondents had to accept before completing the questionnaire, in accordance with the Helsinki Declaration<sup>7</sup>. Confidentiality was maintained at all times, in accordance with Organic Law 3/2018, of 5 December on Personal Data Protection and Guarantee of Digital Rights.

## RESULTS

A total of 115 entries were recorded on the Qualtrics platform from 24 June to 9 November 2022. 25 that did not include any answers were excluded, to obtain a total of 90 valid questionnaires.

The study participants consisted of 80% women and 20% men, with an average age range of 45.4 years (confidence interval [CI] of 95%: 43.4-47.3), and an age range between 23 and 67 years. The staff at the prisons had an older average age, with a mean difference in years of 4.6 (CI of 95%: 0.6-8.7;  $p = 0.024$ ).

As regards categories, 61% were nursing professionals and 39% were auxiliary nursing care technicians (TCAE) in geriatrics/nursing. The TCAE in geriatrics/nursing presented a mean age difference in years of 4.8 (CI of 95%: 0.5-8.8;  $p = 0.028$ ) in their favour.

The participants were distributed according to the work centres: 55 (55.0%) in prisons, 37 (37.0%) in residences for the elderly.

The geographical locations of the respondents represented 25 provinces of 10 autonomous communities (Andalusia, Aragon, Balearic Islands, Canary Islands, Castille-Leon, Castille-La Mancha, Catalonia, La Rioja, Basque Country and the Region of Valencia).

A total of 14 items were assessed in the descriptive analysis of the questionnaire. Figure 1 shows the value of the score average in a box plot. The values are expressed as the mean and, between parentheses, the interquartile range, which consists of the range between percentile 25 and percentile 75 for the scores on the Likert scale (0-4 points). The answers were generally grouped into the categories corresponding to the Likert scale between “not often” and “often” for symptoms of the autonomic nervous system 1 (0 to 2), respiratory 1 (0 to 2), cardiovascular 1 (0 to 2), general somatic symptoms (sensorial) 1 (0 to 2) and depressed

mood 1 (0 to 2). The appearance of gastrointestinal symptoms was highlighted as something that happens with more frequency than in the rest 1 (0 to 4); insomnia, which occurred with equal frequency or even more 2 (0 to 3), general somatic symptoms (muscular) 2 (1 to 3), intellectual functions 2 (1 to 3), tension 2 (1 to 3) and anxious mood 2 (1 to 3) (all the ones that present a mean score closest to the category of “often” are the most habitual).

Only two are stand out in the categories of “never” or “not often”: one for genital-urinary symptoms 1 (0 to 2) and another for the presentation of any symptom while completing the questionnaire 0 (0 to 1). Although they are the only two categories where outliers appear outside 75% of the answers and in values corresponding to the appearance of “always” or “very severe”, these are very specific cases of persons who may have felt affected.

The evaluation of the total score of the questionnaire showed that 58.9% of the total sample presented scores compatible with levels of anxiety, while 41.1% showed normal scores. 62.0% of the professionals with a score compatible with anxiety presented severe anxiety (Figure 2).

An initial comparison of the means was carried out on the comparative analysis between the items of the questionnaire and the professional categories, and

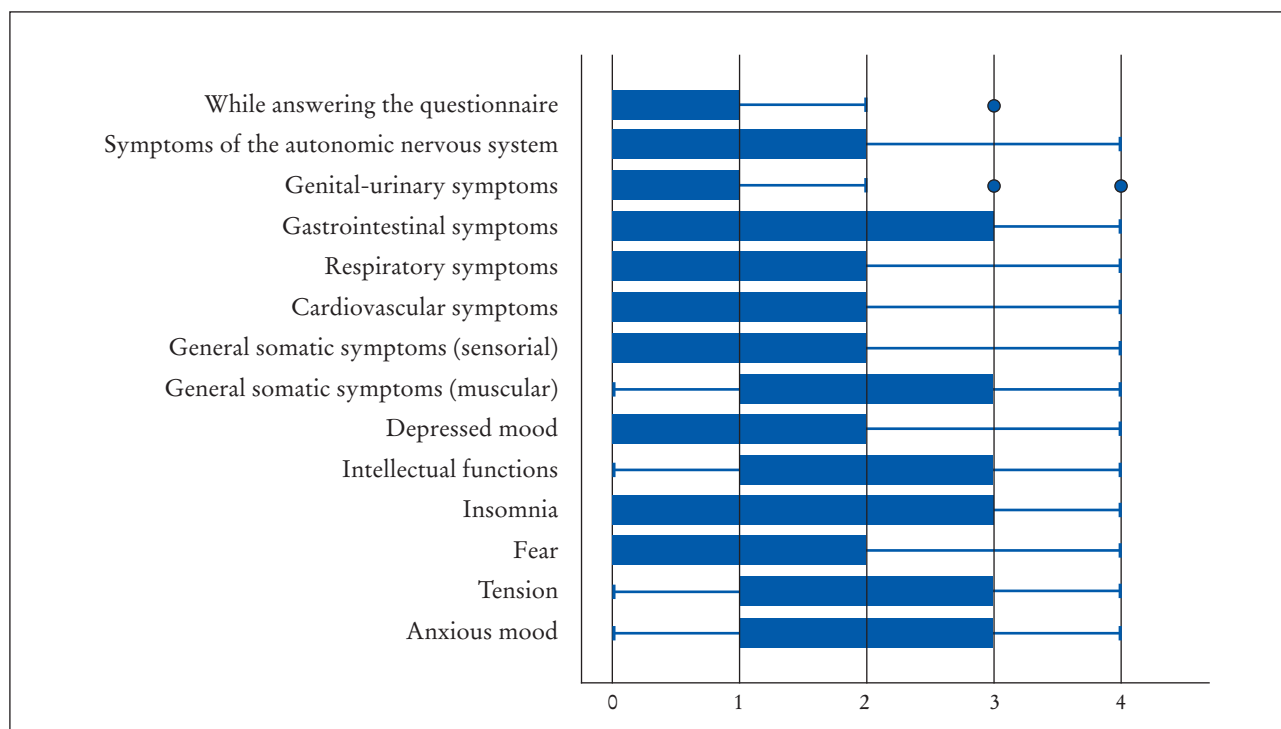


Figure 1. Box plot of items in questionnaire.

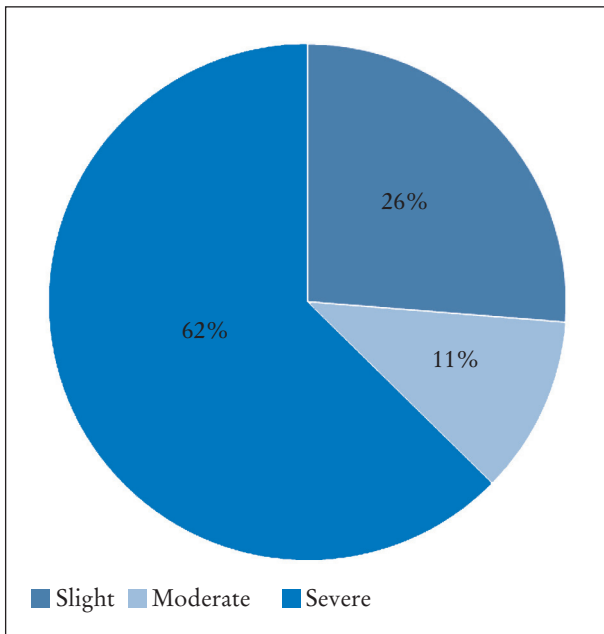


Figure 2. Staff with notable levels of anxiety.

no significant difference was found in any of the items (Table 1).

An evaluation was carried out of the trend of the ordinal qualitative variable using the linear trend  $\chi^2$  of all the questionnaire items, comparing the two professional categories. A statistical significance was found in the general somatic symptoms (muscular) ( $p = 0.043$ ), where a higher percentage of presentation of this symptom was observed amongst auxiliary staff than nursing professionals. A statistically significant difference was also found in the linear trend for general somatic symptoms (sensorial) ( $p = 0.039$ ), although the reverse was found in this case, as there

was a higher percentage “not often” or “never” in comparison with more frequent ones in both professional groups.

The comparison between prisons and residences for the elderly showed statistically significant differences in the averages of some items in the questionnaire, specifically in the mean of the scores obtained for symptoms of tension, general somatic symptoms (muscular) and general somatic symptoms (sensorial), which are higher amongst staff working in residences for the elderly than those working in prisons (Table 2).

Analysis of the linear trend for the “tension” item to in a comparison of the centres showed a progressively increasing trend in this symptom between the residences for the when they are compared to prisons ( $p = 0.022$ ). If we determine the odds ratio (OR), this is 1.49 (CI del 95%: 1.055-2.101;  $p = 0.024$ ). In other words, tension has an almost 1.5 times higher probability of appearing in residences for the elderly than in prison.

The linear trend  $\chi^2$  for general somatic symptoms (muscular) is clearly significant ( $p = 0.006$ ), and these symptoms progressively increase more in residences for the elderly than in prisons. A binary logistical regression analysis showed an OR of 1.55 (CI of 95%: 1.125-2.141;  $p = 0.007$ ). In other words, the probability of muscular somatic symptoms appearing is somewhat over 1.5 times more likely in residences for the elderly than in prisons.

It was observed that women were up to 3.4 times more likely to suffer from anxiety than men (OR: 3.447; CI of 95%: 1.140-10.424;  $p = 0.028$ ). A significantly higher percentage of women were observed to suffer from severe anxiety when compared to men.

Table 1. Comparison of means in items by professional categories.

	Mann-Whitney U	Wilcoxon W	Score Z	Asymptotic significance (bilateral)
Anxious mood	900.000	2.440.000	-0.305	0.760
General somatic symptoms (muscular)	717.000	2.257.000	-1.884	0.060
General somatic symptoms (sensorial)	726.000	2.266.000	-1.863	0.062
Cardiovascular symptoms	825.000	2.365.000	-0.983	0.326
Respiratory symptoms	927.000	2.467.000	-0.071	0.943
Gastrointestinal symptoms	848.000	1.443.000	-0.769	0.442
Genital-urinary symptoms	921.500	1.516.500	-0.136	0.892
Symptoms of autonomic nervous system	879.000	2.364.000	-0.348	0.728
While answering the questionnaire	883.000	2.423.000	-0.491	0.624

Table 2. Comparison of means in the items by type of centre.

	Mann-Whitney U	Wilcoxon W	Score Z	Significance
Anxious mood	981.000	2.206.000	-0.394	0.693
Tension	739.000	1.964.000	-2.370	0.018
Fear	967.000	2.192.000	-0.530	0.596
Insomnia	838.000	2.063.000	-1.564	0.118
Intellectual functions	1.011.000	1.914.000	-0.147	0.883
Depressed mood	1.000.000	1.903.000	-0.239	0.811
General somatic symptoms (muscular)	685.500	1.910.500	-2.800	0.005
General somatic symptoms (sensorial)	782.000	2.007.000	-2.083	0.037
Cardiovascular symptoms	833.500	2.058.500	-1.647	0.099
Respiratory symptoms	901.500	2.126.500	-1.068	0.286
Gastrointestinal symptoms	908.500	2.133.500	-1.007	0.314
Genital-urinary symptoms	943.500	2.168.500	-0.817	0.414
Symptoms of autonomic nervous system	874.000	2.050.000	-1.132	0.258
While answering the questionnaire	998.500	2.223.500	-0.273	0.785

## DISCUSSION

The purpose of this study was to analyse the emotional levels of anxiety experienced by health professionals who work in closed institutions during the outbreak of SARS-CoV-2. To carry out the analysis, we examined the levels of anxiety in a range of closed institutions in Spain.

The average age of the participants in the survey was 45.4 years and 80% were women, which exceeded the figures in the study by Espín-Arguello<sup>8</sup>, which recorded an average age of 34.5 years and a proportion of women of 69.3%.

The results indicate that 37.5 of the nurses surveyed presented severe anxiety levels, which is a figure similar to the one obtained in previous studies such as those by Santamaría<sup>9</sup>, Obando *et al.*<sup>10</sup> and Huang & Hao<sup>11</sup>, who recorded 37.0, 39.1 and 35.1%, respectively. However, other studies such as the one by Gao *et al.*<sup>12</sup> showed lower anxiety levels (22.6%), while higher figures were found in other countries, in studies that showed anxiety levels of 51<sup>13</sup>, 45.1<sup>14</sup> and 73.3%<sup>15</sup>. As these studies show, nursing professionals experience medium and high levels of anxiety and also present other symptoms such as depression, worry and insomnia<sup>16</sup>.

Our study showed that women present higher levels of anxiety than men, and that nurses in general more serious anxiety levels. These results match the ones found in the systematic review by Pappa *et al.*<sup>17</sup>.

Healthcare in closed institutions can be especially demanding due to the characteristics of the residents. Generally speaking, a higher proportion of the population in such centres suffer from chronic diseases than the general public, and they are often in situations of immunodepression, which increases the risk of death if they are infected by a disease like SARS-CoV-2<sup>18</sup>.

What is more, an excessive workload is a common feature of life in prisons and residences for the elderly, which may limit the use of physical distancing; which is generally one of the most effective preventive measures. What is common to all closed institutions is that they have collectives that are especially vulnerable to COVID-19, was shown in the studies by Rodríguez<sup>19</sup> and Pinazo-Hernandis<sup>18</sup>.

Any outbreak in a closed institution can lead to serious public health issues. Such outbreaks generally tend to be explosive in terms of their capacity for infection, and greatly exceed the capacities of the healthcare services to respond to such a crisis, to the extent that they often need help from community services. The outcome is that healthcare personnel who work in such institutions find themselves in situations of extreme tension and levels of anxiety that go way beyond what is normally expected of them. Their work is not limited to treating sick patients, they also have to fight with all the resources at their disposal to prevent infection in their “mini-societies”, as Ricci-Cabello *et al.*<sup>20</sup> highlight in their study.



Table 3. Evaluation of anxiety level using the Hamilton questionnaire and comparisons.

Anxiety: (yes/no)	Type of centre							Professional category					Sex				
	Residence for the elderly		Prison (p 0,161)			TCAE		Nurse (p 0,666)			Men		Women (p 0,023)				
			n°	%	Sig.			n°	%	Sig.			n°	%	Sig.		
Normal	37	41.1	14	33.3	23	47.9	0.161	13	38.2	24	42.9	0.666	11	64.7	25	34.7	0.023
Slight	14	15.6	7	16.7	7	14.6	0.786	5	14.7	9	16.1	0.862	3	17.6	11	15.3	0.809
Moderate	6	6.7	2	4.8	4	8.3	0.498	4	11.8	2	3.6	0.131	1	5.9	5	6.9	0.875
Severe	33	36.7	19	45.2	14	29.2	0.114	12	35.3	21	37.5	0.833	2	11.8	31	43.1	0.008
Total	90	100	42	100	48	100		34	100	56	100		17	100	72	100	

**Note.** TCAE: auxiliary nursing care technician.

The main limitations of this study include the method of sampling used. Given that it was not a random sample, biases may have occurred more easily. The opinion of professionals who work in centres where no cases occurred may differ significantly from those where outbreaks took place.

Another point to take into consideration is the type of design used in the study. The cross-sectional design made it impossible to establish causal relationships between the variables that were analysed. It would be recommendable therefore to use longitudinal designs in future studies to enable the influence of certain variables in anxiety to be evaluated.

It should be pointed out that the study had a wide geographical representation of professionals in Spain. The opinions of health professionals from 15 provinces belonging to 10 of the 17 autonomous communities were collected. These figures are similar to the ones found in other studies, such as Santamaría *et al.*<sup>9</sup> and García-Iglesias *et al.*<sup>16</sup>.

It is important to mention that there are few studies published in Spain on levels of anxiety amongst healthcare professionals working in closed institutions, since most studies focus on hospitals. Only one recent article was found on Spanish prisons, by Marco *et al.*<sup>21</sup>, which analysed the pandemic in prisons and indicated that up to a certain period the pandemic was reasonably under control in such centres and that the number of admissions to intensive care units was low, as was the rate of mortality. It would be interesting to study the psychological aspects of health professionals who work in closed institutions in greater depth, since working conditions are often precarious in terms of staff provisions and the characteristics of the patients that they care for. By doing so, it may well be possible to improve medical care, and of course the mental health of the carers.

To conclude, health professionals who work in closed institutions experience notable levels of anxiety, which makes it necessary to implement preventive measures to prevent more serious mid- and long-term consequences in the future.

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