Prevalence of stress, burnout syndrome, anxiety, and depression among physicians of a teaching hospital during the COVID-19 pandemic

Prof. Francisco J. Appiani, M.D.[a], Federico Rodríguez Cairoli, M.D.[a], Prof. Luis Sarotto Jr., M.D.[b], Claudio Yaryour, M.D.[c], María E. Basile, M.D.[a] and Juan M. Duarte, M.D.[a]

ABSTRACT

Introduction. Health care workers experience a tremendous strain while performing their activities, very frequently leading to stress, burnout syndrome, and psychopathological impact. The COVID-19 pandemic may cause physicians to suffer these effects even to a greater extent. Our objective was to describe the frequency of stress, burnout syndrome, anxiety, and depression during the pandemic, and analyze the associations with different independent outcome measures.

Methods. Observational, cross-sectional study conducted 2 months after the lockdown was established in Argentina. Clinical specialists, surgeons, emergency physicians, and those with no direct contact with patients were surveyed using a sociodemographic questionnaire and 3 self-administered inventories: Health Professions Stress Inventory, Maslach Burnout Inventory, and Hospital Anxiety and Depression Scale.

Results. The prevalence of stress was 93.7 % (95 % confidence interval [CI]: 90.33-96.2), burnout syndrome 73.5 % (95 % CI: 68.2-78.4), anxiety 44 % (95 % CI: 38.4-49.8), and depression 21.9 % (95 % CI: 17.3-26.9). No association was observed between the frequency and medical specialty. The frequency of burnout syndrome, anxiety, and depression was significantly higher among residents and physicians working in the emergency department.

Conclusions. Residents and emergency physicians working 24-hour shifts showed significantly higher percentages of burnout syndrome, anxiety, and depression compared to staff and head physicians. These findings may be associated with a higher workload and less experience. It is compulsory to take preventive and therapeutic measures to protect those in the pandemic front line.

Key words: *COVID-19, burnout, anxiety, depression, psychological stress.*

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a. Unit of Neuropsychopharmacology. Department of Teaching and Research.
b. Department of Surgery.
c. Emergency Department.
Hospital de Clínicas José de San Martín, Universidad de Buenos Aires, Autonomous City of Buenos Aires, Argentina.

E-mail address:
María E. Basile, M.D.: basileeuge@gmail.com

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INTRODUCTION

The novel coronavirus disease (COVID-19) pandemic, caused by the coronavirus of 2019 (SARS-CoV-2), started in China towards the end of December 2019 and spread throughout the world over a few months.[1] Given its rapid dissemination and clinical consequences, health care resources have been under a tremendous strain.

Health care staff, mostly physicians, have been especially affected by the pandemic. For example, in Italy, 20 % of health care workers who completed a survey had COVID-19 and mentioned that some of their colleagues had died.[2]

Physicians working in the front line face an increasingly greater level of stress due to a high workload, the sorrow of losing patients and colleagues, and sometimes insufficient resources available (e.g., personal protective equipment) or lack of training in protection protocols. This is inherently related to the fear of getting sick, which may become a straight road to psychophysical exhaustion and mental health disorders.[3] But this problem is not limited to those in the front line of the pandemic. Some physicians are suffering the interruption of their work activities because they are in high-risk groups. The consequences of confinement on these health care providers are still unknown.[4,5]

The objective of this study was to describe the frequency of stress, burnout syndrome, anxiety, and

depression in a sample of physicians from Hospital de Clínicas José de San Martín, which depends on the School of Medicine of Universidad de Buenos Aires, during the COVID-19 pandemic lockdown and analyze the associations with different independent outcome measures.

MATERIALS AND METHODS

This was an observational, cross-sectional study conducted in May 2020. The sample was made up of physicians from a polyvalent teaching hospital.

The inclusion criteria were all staff physicians, residents, and head physicians working in clinical, surgery, closed, diagnostic, pediatrics, and neonatology areas who signed the informed consent.

The exclusion criteria were physicians who were absent at the moment of the study and those who did not answer the questionnaire in a complete or partial manner.

The survey was administered in Buenos Aires, Argentina, when the situation was not extremely critical and cases had not reached their peak. At the time of the study conduct, the hospital where the sample came from had 4 hospitalization units reserved for COVID-19 patients and had received a total of 314 infected patients.

The questionnaire had 2 sections. The first section included sociodemographic themes with the following independent outcome measures: age, marital status, job position, activities performed at the hospital during the pandemic, seniority, medical specialty, working exclusively in the emergency department, working in the room assigned for COVID-19 patients, if they were adequately trained to be in contact with patients with potential COVID-19 infection, if they were exempt from seeing patients due to risk factors, if they stopped working, presence of transient COVID-19-like symptoms, and if they started using anxiolytics or increased the anxiolytic dose.

The second section included 3 scales: the Health Professions Stress Inventory (HPSI), the Maslach Burnout Inventory (MBI), and the Hospital Anxiety and Depression Scale (HADS), all of which have been validated in Spanish language.[6-8]

The HPSI is an instrument developed to assess stress levels and sources among health care providers. It is a self-administered questionnaire that comprises 30 job situations that health care providers may encounter in their daily practice. Respondents answer how often they find each situation to be stressful in their work setting based on a 5-point Likert-like scale (from never to very often). Each item is scored from 0 to 4; and the potential total score for the HPSI may range from 0 to 120.[9]

For this study, the analysis was dichotomous: absence of stress (≤ 30 points) and presence of stress (≥ 31 points).

The MBI is an introspective psychological questionnaire made up of 22 items pertaining to burnout syndrome. It measures 3 dimensions: emotional exhaustion, depersonalization, and lack of personal accomplishment. A score of ≥ 26 for exhaustion, ≥ 9 for depersonalization and/or ≤ 36 for personal accomplishment was defined as the presence of burnout syndrome.[7,8]

The HADS[10] is a scale made up of 14 items. It is a fast screening for symptoms of depression (7 items) and anxiety (7 items) for non-psychiatric populations, medically ill populations, outpatients, and the general population.[11,12] Zigmond and Snaith established that, for the depression and anxiety subscales, a score of 0-7 points is a negative case, of 8-10 points is a potential case, and > 11, a positive case.[10,13] For this study, the cutoff score for the screening of anxiety and depression was ≥ 8.

All the instruments mentioned here were sent via Google Forms® to 440 physicians (staff physicians, head physicians, and residents) from the same hospital between May 6th and 11th, 2020 during the COVID-19 pandemic, 2 months into the lockdown established in Argentina. The informed consent was electronically signed before completing the questionnaire.

Statistical analysis

A descriptive analysis was done for each outcome measure to look for bivariate associations: sex, age, job position, seniority, medical specialty, working at the hospital during the pandemic, stopping work, caring for patients with suspected or confirmed COVID-19 diagnosis, perception of not being adequately trained to be in contact with patients with potential

COVID-19 infection, being exempt from seeing patients due to medical risk factors, presence of transient COVID-19-like symptoms, starting anxiolytics or increasing the anxiolytic dose, and working 24-hour shifts. Non-parametric tests (χ^2 test and Fisher's exact test) were used for quantitative outcome measures to look for an association. A value of $p < 0.05$ was considered statistically significant. The SPSS® software for Mac®, version 24, was used.

Ethical considerations

The study was carried out in compliance with the Declaration of Helsinki and the Law of *Habeas Data*, and was approved by the Ethics in Clinical Research Committee of Hospital de Clínicas José de San Martín.

RESULTS

The flowchart (*Figure 1*) shows the participant screening and assessment process.

Sociodemographic data are shown in *Table 1*. The results of the prevalence of stress (HPSI), burnout syndrome (MBI), and anxiety and depression (HADS) are shown in *Table 2*.

Analysis of the HPSI

Out of 440 surveyed physicians, 305 (69.38 %) completed the stress questionnaire by Wolfgang.

The overall prevalence of stress was 93.7 % (95 % confidence interval [CI]: 90.33-96.2).

A positive score for stress was significantly associated with regularly working at the hospital during the pandemic, having transient COVID-19-like symptoms, and starting anxiolytics or increasing the anxiolytic dose (*Table 2*).

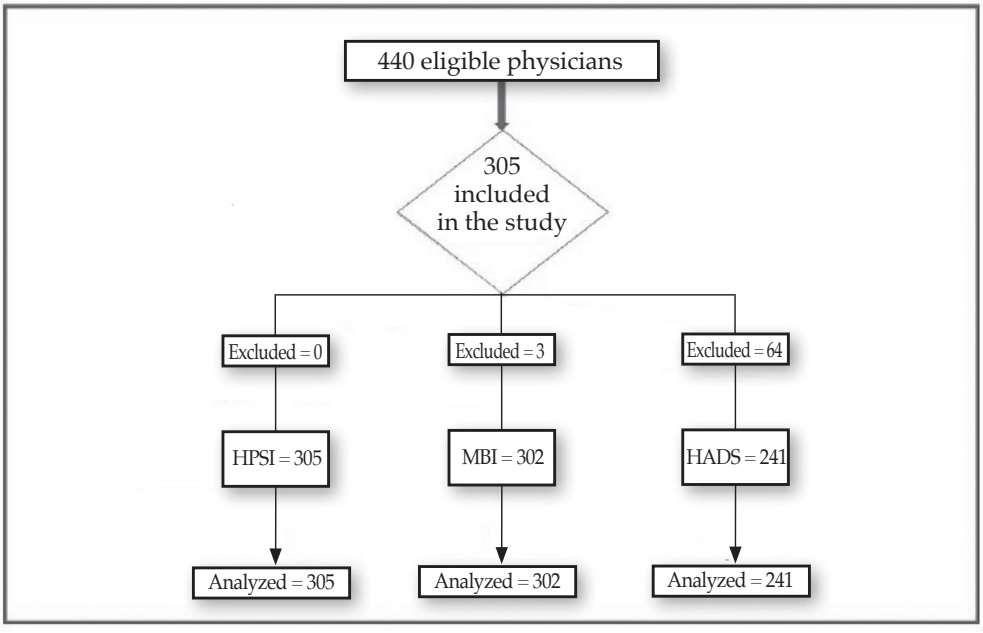
Analysis of the MBI

Out of 440 surveyed physicians, 302 (68.63 %) completed the questionnaire by Maslach.

The prevalence of burnout syndrome was 73.5 % (95 % CI: 68.2-78.4); physicians who had a positive score were significantly younger than those who did not.

The presence of burnout syndrome was associated with having less seniority, being a resident, caring for patients with potential or confirmed COVID-19 infection, having transient COVID-19-like symptoms, and working 24-hour shifts (*Table 2*).

FIGURE 1. *Flowchart of study participants*



HPSI: Health Professions Stress Inventory, MBI: Maslach Burnout Inventory, HADS: Hospital Anxiety and Depression Scale.

Analysis of the HADS

Out of 440 surveyed physicians, 241 (55 %) completed the HADS.

The prevalence of anxiety was 44 % (95 % CI: 17.3-26.9) and the prevalence of depression was 21.9 % (95 % CI: 38.4-49.8). All physicians with a high score for anxiety also showed a high score for depression.

The presence of anxiety and depression symptoms was negatively associated with seniority. That is to say, physicians with less seniority showed more anxiety and depression symptoms. Actually, residents showed an even higher frequency of anxiety and depression symptoms than the other surveyed physicians.

Providing care to patients with a suspected or confirmed SARS-CoV-2 infection was related to anxiety symptoms only.

Anxiety and depression symptoms also showed a significant association with transient SARS-CoV-2-like symptoms, taking anxiolytics, and working 24-hour shifts at the emergency department (*Table 2*).

DISCUSSION

The high prevalence of stress, exhaustion, anxiety, and depression symptoms found in this study is not unexpected given the usual

TABLE 1. *Sociodemographic data collected during the COVID-19 pandemic*

Demographic data *n* **= 302**		
Sex	Male	147 (51.3 %)
	Female	155 (48.7 %)
Age (± SD)	Male	44.42 ± 11.58
	Female	42.07 ± 12.42
Position	Head	47 (15.6 %)
	Staff physician	152 (50.3 %)
	Resident	103 (34.1 %)
Seniority	0-5 years	97 (32.1 %)
	6-15 years	69 (22.8 %)
	≥ 16 years	136 (45 %)
Type of medical specialty	General medicine	163 (54 %)
	Surgery	117 (38.7 %)
	Emergency department only	10 (3.3 %)
	No direct contact with patients	12 (4.1 %)
Working at the hospital during the pandemic	Yes	245 (81 %)
	No	56 (19 %)
Stopped working	Yes	152 (51 %)
	No	146 (49 %)
Care of patients with suspected or confirmed COVID-19 diagnosis	Yes	138 (45.7 %)
	No	164 (54.3 %)
Perception of not being adequately trained to be in contact with patients with potential SARS-CoV-2 infection	Yes	196 (64.9 %)
	No	106 (35.1 %)
Exempt from seeing patients due to medical risk factors	Yes	44 (15.23 %)
	No	256 (84.7 %)
Presence of transient SARS-CoV-2 infection-like symptoms	Yes	113 (37.4 %)
	No	189 (62.6 %)
Started taking anxiolytics or increased anxiolytic dose	Yes	43 (14.2 %)
	No	259 (85.8 %)
24-hour shifts	Yes	133 (44 %)
	No	169 (56 %)

working conditions of hospital physicians. In addition, the pandemic has been associated with different additional factors that may contribute to these findings, such as a high workload, moral dilemmas, and a work environment that has completely changed from the period before the pandemic.[14]

Physicians usually work under high levels of stress, making them more prone to burnout syndrome, anxiety, and depression. Therefore, it is expected that, given the setting of the pandemic, physicians are experiencing a greater strain and a higher risk for high levels of burnout syndrome, anxiety, and depression.

In a prior analysis carried out in the same hospital during November 2019, a very high prevalence of stress and burnout syndrome (86 % and 73 %, respectively) was noted; also,

TABLE 2. *Analysis of independent outcome measures in relation to stress, burnout syndrome, anxiety, and depression*

Independent outcome measures		HPSI		MBI		HADS Anxiety		HADS Depression	
		Stress	Statistical results	Burnout syndrome	Statistical results	Anxiety	Statistical results	Depression	Statistical results
Sex	Male	148 (95.5 %)	χ^2: 1.702	107 (72.8 %)	χ^2: 0.76	27 (18.4 %)	χ^2: 2.039	38 (44 %)	χ^2: 3.221
	Female	138 (91.8 %)	*p*: 0.238	115 (74.2 %)	*p*: 0.796	39 (25.2 %)	*p*: 0.198	76 (49 %)	*p*: 0.93
Seniority (years)	0-5	92 (94.8 %)	χ^2: 0.501	86 (88.7 %)	χ^2: 26.389	32 (33 %)	χ^2: 11.993	58 (58.9 %)	χ^2: 17.328
	6-15	65 (94.2 %)		55 (79.5 %)		15 (21.7 %)		31 (44.9 %)	
	≥ 16	126 (92.6 %)	*p*: 0.788	81 (59.6 %)	***p* < 0.001***	19 (14 %)	***p*: 0.002***	44 (32.4 %)	***p* < 0.001***
Position	Head	42 (89.4 %)	χ^2: 3.731	100 (65.8 %)	χ^2: 22.914	6 (12.8 %)	χ^2: 10.019	10 (21.3 %)	χ^2: 23.425
	Staff physician	141 (92.6 %)	*p*: 0.198	29 (61.7 %)		22 (17.8 %)		60 (39.5 %)	
	Resident	100 (97.1 %)		93 (90.3 %)	***p* < 0.001***	33 (32 %)	***p*: 0.007***	63 (61.2 %)	***p*: 0.002***
Medical specialty	General medicine	152 (93.3 %)	χ^2: 0.833	121 (74.2 %)	Fisher's exact test	39 (23.9 %)	Fisher's exact test	75 (45.4 %)	Fisher's exact test *p*: 0.391
	Surgery	110 (94 %)	*p*: 0.778	86 (73.5 %)	*p*: 0.644	23 (19.7 %)	*p*: 0.813	50 (42.7 %)	
	Emergency Dep.	10 (100 %)		8 (80 %)		2 (20 %)		6 (60 %)	
	No contact	11 (91.7 %)		7 (58.3 %)		2 (16.7 %)		3 (25 %)	
Working at hospital^	Yes	234 (95.5 %)	χ^2: 5.202	185 (75.5 %)	χ^2: 2.943	10 (17.9 %)	χ^2: 0.666	21 (37.5 %)	χ^2: 1.247
	No	49 (87.5 %)	***p*: 0.049***	36 (64.3 %)	*p*: 0.095	56 (22.9 %)	*p*: 0.478	112 (45.7 %)	*p*: 0.167
Stopped working	Yes	137 (93.8 %)	χ^2: 0.21	106 (69.7 %)	χ^2: 1.845	33 (22.6 %)	χ^2: 0.215	68 (46.6 %)	χ^2: 1.260
	No	142 (93.4 %)	*p*: 0.999	112 (76.7 %)	*p*: 0.192	31 (20.4 %)	*p*: 0.674	61 (40.1 %)	*p*: 0.293
Cares for COVID-19 patients^^	Yes	154 (93.9 %)	χ^2: 0.23	109 (79.6 %)	χ^2: 4.858	39 (28.5 %)	χ^2: 6.283	65 (39.6 %)	χ^2: 3.027
	No	129 (93.5 %)	*p*: 0.99	112 (68.3 %)	***p*: 0.036***	27 (16.5 %)	***p*: 0.017***	68 (49.6 %)	*p*: 0.103
Self-perception of adequate training	Yes	103 (97.2 %)	χ^2: 3.31	135 (68.9 %)	χ^2: 6.154	26 (24.5 %)	χ^2: 0.684	52 (49.1 %)	χ^2: 1.668
	No	180 (91.2 %)	*p*: 0.08	87 (82.1 %)	***p*: 0.014***	40 (20.4 %)	*p*: 0.466	81 (41.3 %)	*p*: 0.225
Exempt due to risk factors	Yes	44 (15.23 %)	χ^2: 0.532	31 (67.4 %)	χ^2: 1.043	59 (23 %)	χ^2: 1.400	114 (44.5 %)	χ^2: 0.165
	No	256 (84.7 %)	*p*: 0.51	191 (74.6 %)	*p*: 0.364	7 (15.2 %)	*p*: 0.255	19 (41.3 %)	*p*: 0.748
Transient COVID-19-like symptoms	Yes	111 (98.2 %)	Fisher's exact test	96 (85 %)	χ^2: 12.148	34 (30.1 %)	χ^2: 7.168	60 (53.1 %)	χ^2: 6.011
	No	172 (91 %)	***p* = 0.01***	126 (66.7 %)	***p*: 0.001***	32 (16.9 %)	***p*: 0.009***	73 (38.6 %)	***p*: 0.017***
Anxiolytics#	Yes	43 (100 %)		37 (86 %)	χ^2: 4.047	21 (48.8 %)	χ^2: 21.375	32 (74.4 %)	χ^2: 18.776
	No	240 (92.7 %)		185 (71.4 %)	*p*: 0.06	45 (17.4 %)	***p* < 0.001***	101 (39 %)	***p* < 0.001***
Working 24-hour shifts	Yes	129 (97 %)	Fisher's exact test	119 (89.5 %)	χ^2: 31.104	40 (30.1 %)	χ^2: 9.405	78 (58.6 %)	χ^2: 20.576
	No	154 (91.1 %)	*p*: 0.054	103 (60.9 %)	***p* < 0.001***	26 (15.4 %)	***p*: 0.003***	55 (32.5 %)	***p* < 0.001***

HPSI: Health Professions Stress Inventory, MBI: Maslach Burnout Inventory, HADS: Hospital Anxiety and Depression Scale, χ^2: chi-square test.
* $p < 0.05$; ^: Working at the hospital during the pandemic; ^^: Patients with suspected or confirmed COVID-19 diagnosis; #: Started anxiolytics or increased dose.

10 % of participants showed a positive score for psychopathology in the GHQ-12.[15] The prevalence of stress increased at Hospital de Clínicas José de San Martín during the pandemic.

In addition, a systematic review conducted by Rothenstein et al. in 2018 reported a 67 % prevalence of burnout syndrome among physicians. This demonstrates that, at baseline, the medical population has a high prevalence of stress, burnout syndrome, and anxiety which, when faced with a pandemic or disaster, would make them particularly vulnerable.[14,16]

This study found that residents are more exposed to burnout syndrome, anxiety, and depression compared to staff physicians and those working as head physicians. It is well known that residents work long shifts with very high demands and are often exposed to work overload and major pressure.[17]

A study conducted in Saint Louis (United States) found, consistent with what has been observed in this study, that residents who were exposed to providing care to COVID-19 patients had a higher prevalence of depression, anxiety, and stress than the general population; they also had a higher rate of burnout syndrome than the non-exposed group.[18]

High stress and exhaustion levels have been associated with a higher risk for psychopathological disorders, especially affective and anxiety disorders. Among the latter, post-traumatic stress disorder may be one of the most feared consequences of stress and burnout syndrome because it tends to become chronic if not treated early, and has a great negative impact on those suffering from it.[19,20]

Another finding of this study was that physicians working 24-hour shifts at the emergency department have high levels of stress and exhaustion. It is worth noting that, at Hospital de Clínicas José de San Martín, after their second year of training, residents also have to work 24-hour shifts at the emergency department. According to these findings, the young residents working at the emergency department may be vulnerable to the impact of the COVID-19 pandemic on mental health. From a precautionary viewpoint, it is important to pay special attention to residents and physicians working 24-hour shifts at the emergency department.

The sociodemographic questionnaires administered also showed a high prevalence of transient symptoms compatible with COVID-19. This finding was correlated to a significant prevalence of stress, exhaustion, anxiety, and depression. The same was noted in physicians who started taking anxiolytics or increased the anxiolytic dose. Both findings may have anxiety as a common factor. It is known that somatic symptoms are related to increased stress, burnout syndrome, anxiety, and depression. It is worth noting that, during the COVID-19 pandemic, the perception of a threatening and uncertain situation has also increased among health care staff. These factors are critical in the process of somatic symptom development,[21,22] e.g., the perception of transient COVID-19 symptoms.

However, it is not possible to conclude that such transient symptoms were actually somatic. Anyway, such speculation about the relation between stress and somatization during the pandemic requires further research.

The conditions analyzed in this study have also been investigated at other facilities. For example, in a study done in Milan, 71.2 % of surveyed physicians had anxiety traits according to the State-Trait Anxiety Inventory; 26.8 % had clinical depression; 31.3 %, clinical anxiety; 34.3 %, stress; and more than 30 %, burnout syndrome. Such values were associated with long working hours, the presence of psychological comorbidities, fear of getting COVID-19, and the perception of lack of support from friends.[23]

Another study carried out in Spain during the COVID-19 pandemic showed that a high percentage of health care providers were emotionally drained. With a cutoff score of 8 for the HADS, 58.6 % of health care providers had anxiety symptoms and 46 %, depression symptoms. Working the night shift or 12- and 24-hour shifts was related to post-traumatic stress disorder and depression; working many hours a week was associated with depression; workers with a lower level of training showed a higher prevalence of post-traumatic stress disorder. Likewise, less trained female workers had a higher prevalence of anxiety, depression, and post-traumatic stress disorder.[24]

A multicenter study conducted in China found that 55.1 % of health care providers had

a positive score for stress and, based on a cutoff score of 8 in the HADS, 54.2 % had anxiety symptoms and 58 %, depression symptoms. Junior and intermediate physicians and those with less than 11 years of experience, as in this study, showed high stress levels. In addition, anxiety and depression symptoms were related to 3 factors: lack of adequate personal protective equipment, being in contact with patients with suspected or confirmed COVID-19 diagnosis, and being female.[25]

Lastly, a meta-analysis done by Greek investigators showed that the prevalence of anxiety among health care providers during the COVID-19 pandemic was 23.32 %; the prevalence of depression, 22.8 %; and 34.32 % had insomnia.[26]

One of the limitations of this study was that results reflect the situation 2 months into the lockdown. A more accurate picture may be obtained with regular follow-up during the pandemic and even after it ends.

Although many articles about this situation have been published, there is still not a clear perspective about how the mental health of health care workers has been affected during the pandemic.[5,27]

CONCLUSION

In the studied sample, residents and emergency physicians working 24-hour shifts showed significantly higher percentages of burnout syndrome, anxiety, and depression compared to staff and head physicians. These findings may be associated with a higher workload and less experience. It is compulsory to take preventive and therapeutic measures to protect those in the pandemic front line. ■

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