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# **Burnout Syndrome in Cardiology Residents. Impact of the COVID-19 Pandemic on Burnout Syndrome in Cardiology Residents**

**Rocio C. Baro Vila, MD, Lucrecia M. Burgos, MD, Alan Sigal, MD, Juan Pablo Costabel, MD, and Alberto Alves de Lima, MD**

*From the Instituto Cardiovascular de Buenos Aires, CABA, Argentina.*

**Abstract:** Burnout syndrome (BO) may be increased during periods of high work and emotional stress, as occurred in the 2019 coronavirus disease pandemic (COVID-19). Resident physicians appear to be more exposed due to the higher workload, prolonged exposure and the first contact with patients. To compare the incidence of burnout syndrome before and during the COVID 19 pandemic in cardiology residents. A prospective study was carried out. The Maslach questionnaire was implemented in cardiology residents of an institution of the City of Buenos Aires, in the month of September 2020, during the COVID-19 pandemic and the results were compared with those prospectively collected in the same population during September of 2019. The survey was anonymous. The questionnaire was responded by 39 residents (2019: 16; 2020: 23). Burnout was observed in 30% (n = 7) in 2019, and in 39% (9%) residents during the COVID-19 pandemic ( $P= 0.77$ ). The median score for emotional exhaustion was 38 (IQR 29-43) for the 2020s group, and 34 (IQR 27-42) for the 2019 ( $P= 0.32$ ). The median score for depersonalization was 12 (IQR 5-19) and 15 (IQR 11-18) for 2020 and 2019 respectively

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**( $P = 0.50$ ). The median score for personal accomplishment in the 2020s group was 30 (IQR 23-37) and 31 (IQR 26-35) in the 2019s ( $P = 0.28$ ). The COVID-19 pandemic was not associated with an increase in the incidence of burnout in cardiology residents, who already report a significant prevalence of this syndrome in pre pandemic period. We emphasize the importance of creating prevention strategies aimed at improving resident's working conditions and quality of life, especially in periods of high stress and workload such as a global health emergency. (Curr Probl Cardiol 2022;47:100873.)**

*Abbreviations:* BO, Burnout; DP, depersonalization; EE, emotional exhaustion; IQR, interquartile range; PA, personal accomplishment; SD, standard deviation

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## Introduction

**T**he Burnout syndrome (BOS), which describes a state of mental and physical exhaustion, product of chronic work stress manifested by negative attitudes and feelings towards the individuals with whom one works and towards the professional role itself, was introduced by Freudenberger in the mid-seventies to give an explanation to the negative process that personnel undergo in their work performance.<sup>1</sup> It is about the feeling of being emotionally exhausted, a response that occurs more frequently in health professionals. This syndrome is associated not only with a decrease in work productivity and worse patients treatment, but also with physical effects such as sleep disturbances, increased cardiovascular risk, and higher suicide rates.<sup>2</sup>

Nowadays, it is impossible to about the exhaustion of health personnel, specifically resident doctors, without thinking about the impact of the Coronavirus disease 2019 (COVID-19) pandemic.

In early December 2019, the first cases of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pneumonia were identified in Wuhan.<sup>3</sup> COVID-19 has spread across China and rapidly to a growing number of countries, soon becoming a pandemic, causing a global public health crisis.<sup>4</sup> For several months, South America has been one of the epicenters of contagion in the world, being the city of Buenos Aires one of the cities with the highest reported COVID-19 cases.

Possibly the crisis increases the sense of vocation of some people, transforming the personal relationships that we have with patients. Alternatively, the anguish and exhaustion of daily work during the pandemic, along with the loss of colleagues and loved ones, can lead many clinicians to become disappointed or despairing.<sup>5</sup>

Multiple studies have been published in recent months on the increase in the prevalence of BO syndrome in the different teams within the health system of the countries most affected by the pandemic, including nurses, residents, physicians, among many others.<sup>6-8</sup> Medical residents could be a vulnerable population to have higher incidence of burnout syndrome, due to having long working hours with night shifts, representing front-line health personnel during the pandemic.

To date, no studies have been published evaluating the incidence of this syndrome during the COVID-19 pandemic in health personnel in Argentina, and especially in resident physicians. For this reason, we decided to explore the phenomenon with the hypothesis that in the period of the COVID-19 pandemic the incidence of burnout syndrome increased in clinical cardiology residents compared to the previous year.

The objective of the study was to compare the incidence of burnout syndrome in cardiology residents before and during the COVID-19 pandemic.

## Methods

A prospective study was carried out, including cardiology residents from a tertiary cardiovascular center in the city of Buenos Aires who entered the program between 2016 and 2019. Those residents who refused to answer the survey were excluded from the study.

The Maslach questionnaire was implemented in cardiology residents of an institution of the City of Buenos Aires, in the month of September 2020, during the COVID-19 pandemic and the results were compared with those prospectively collected in the same population during September of 2019.

The instrument used was an anonymous, voluntary and self-reporting form adapted from the Burnout Short Questionnaire (Fig 1), according to modifications performed on the Maslach Burnout Inventory Manual validated for Spanish-speakers.<sup>9</sup> The survey was sent electronically through Google Forms.

The questionnaire consists of 22 items assessed with a Likert-type scale identifying BO in 3 dimensions: (1) emotional exhaustion (EE) with 9 items; (2) depersonalization (DP) with 5 items (the score of these

1.	I feel emotionally drained from my work.
2.	I feel used up at the end of the workday.
3.	I feel fatigued when I get up in the morning and have to face another day on the job.
4.	I can easily understand how my patients feel about things.
5.	I feel I treat some patients as if they were impersonal objects.
6.	Working with people all day is really a strain for me.
7.	I deal very effectively with the problems of my patients.
8.	I feel burned out from my work.
9.	I feel I'm positively influencing other people's lives through my work.
10.	I've become more callous toward people since I took this job.
11.	I worry that this job is hardening me emotionally.
12.	I feel very energetic.
13.	I feel frustrated by my job.
14.	I feel I'm working too hard on my job.
15.	I don't really care what happens to some patients.
16.	Working with people directly puts too much stress on me.
17.	I can easily create a relaxed atmosphere with my patients.
18.	I feel exhilarated after working closely with my patients.
19.	I have accomplished many worthwhile things in this job.
20.	I feel like I'm at the end of my rope.
21.	In my work, I deal with emotional problems calmly.
22.	I feel patients blame me for some of their problems.

**FIG 1.** Burnout short questionnaire according to modifications performed on the Maslach Burnout Inventory Manual validated for Spanish-speakers.

dimensions is directly proportional to the intensity of the syndrome) and, (3) personal accomplishment (PA) with 8 items (the score obtained is inversely proportional to the intensity of the BO syndrome).

The degree of BO was considered as a continuous variable, with different intensities, and BO was defined as the concomitant presence of high EE (>26) and DP (>9) scores, and low PA (<33) score.

The degree of severity was defined according to categories in each dimension.

- Depersonalization: High >9, Medium 6-9, Low <6.
- Personal accomplishment: Low <30, Medium 34-39, High >40.
- Emotional exhaustion High >27, Medium 19-26, Low <19.

Demographic data and 23 were collected, to assess the presence of burnout in these subpopulations.

The impact of the pandemic on the prevalence of BO was compared using unpaired analysis. In addition, the global prevalence of BO was assessed according to age, sex and progress in the cardiology training program, post graduate year 1-4 in both periods. In addition, quantitative changes in the burnout subscales were assessed, as well as the prevalence of the high category in DP, EE, and PA dimensions.

## Statistical analysis

Continuous variables were expressed as mean and standard deviation (SD) or median and interquartile range (IQR), according to the observed distribution. Kolmogorov Smirnov or Shapiro-Wilk test according to the sample size was used to determine distribution. To compare continuous variables, depending on the distribution, the Student's *t* test or the Mann-Whitney *U* was used. Categorical variables were expressed as numbers and percentages. Comparisons between proportions were performed using the Chi square test or Fisher's exact test, according to the frequency of expected values.

Two-tailed *P* values <0.05 were considered statistically significant. SPSS statistics, Version 23.0 (IBM Corporation, Armonk, NY) was used for statistical analysis.

## Ethical considerations

This study was approved by institution research and ethics board. And was registered on the PRIISA.BA platform of Buenos Aires city Ministry of Health.

## Results

A total of 39 surveys were responded (2019  $n = 16$ ; 2020  $n = 23$ ). Of the 23 residents eligible in 2019, 16 answered the survey (69%) and 23 responded in 2020 (100%). All the questionnaires could be analyzed.

Burnout was observed in 7 cardiology residents (30%) in 2019, and in 9 (39%) residents during the COVID-19 pandemic. There was no difference in the prevalence of BO syndrome among the 2 groups ( $P = 0.77$ ).

Of the 9 residents presenting BO during 2020, 4 (44%) were men and 5 (56%) were women. Third year residents was the group with the highest incidence of BO with 4 (66.6%) of them meeting criteria for BO syndrome, followed by fourth year residents of whom 3 (50%) met the same criteria, and second year residents with 2 residents (40%) affected by BO syndrome. None of the first-year residents fulfilled criteria for BO as well as the chief of residents.

We didn't find a significant difference in the prevalence of BO syndrome between both groups according to sex or year of residence.

The median score for emotional exhaustion was 38 (IQR 29-43) for the 2020s group, and 34 (IQR 27-42) for the 2019 ( $P = 0.32$ ). The median score for depersonalization was 12 (IQR 5-19) and 15 (IQR 11-18) for 2020 and 2019, respectively ( $P = 0.50$ ). Finally, the median score for personal accomplishment in the 2020s group was 30 (IQR 23-37) and 31 (IQR 26-35) in the 2019s ( $P = 0.28$ ; [Table 1](#)).

When comparing the prevalence of high levels of emotional exhaustion and depersonalization among the 2 groups there were no differences, as well as low levels of personal accomplishment were no statistical difference was found either ([Table 2](#)).

## Discussion

From the analysis of surveys conducted in cardiology residents in 2019 and 2020 during the COVID-19 pandemic, we found no differences in the incidence of burn out syndrome.

**Table 1.** Median score of each BO subscale

Dimension	2020 score Median (IQR)	2019 score Median (IQR)	P
Emotional exhaustion	38 (29-43)	34 (27,25-42,75)	0.32
Depersonalization	12 (5-19)	15 (11-18,5)	0.50
Personal accomplishment	30 (23-37)	31,5 (26,5-35)	0.28

**Table 2.** Prevalence of high emotional exhaustion, depersonalization and low personal accomplishment scores in each group

Dimension	2020 N = 23	2019 N = 16	P
Emotional exhaustion >26	19 (82%)	13 (81%)	0.61
Personal accomplishment <33	16 (69%)	10 (62%)	0.15
Depersonalization >9	14 (60%)	13 (81%)	0.45

According to surveys conducted in our medical institute previously, the prevalence of BO syndrome was of approximately 30% since 2017, similar to the incidence reported during 2019 among cardiology residents and fellows in multiple medical institutions in Capital Federal, Argentina. This number seems to be lower than those reported from other countries of Latin America, where BO syndrome can be as high as 90% during pre-pandemic periods.

No information has been published to date regarding BO syndrome in medical residents in Argentina, therefore no comparison can be made between cardiology residents and other medical specialties in order to hypothesize about the most affected areas.

Our BO incidence was no different during the pandemic in comparison to previous years, this could be explained by many factors. First, the survey was conducted in a monovalent institution specialized in cardiology, for that reason the number of patients suffering from COVID-19 disease were significantly lower in comparison to general hospitals. Also, as it is a high complexity sanatory, residents are used to high work stress level. The changes in the work schedule were residents are on duty for 15 days, followed by 15 days at home as backup in case any of their colleagues got infected functioned as resting days, as we had a low number of infections in hospital staff. Finally, due to the compulsory population isolation imposed by the national government, the number of medical consultations and programmed procedures were significantly reduced, resulting in a lower workload during the firsts months of the pandemic.

According to the information provided from other countries, the most affected health workers seem to be those in emergency rooms and critical care units. Although cardiology is a critical specialty, the pathologies present in our patients differ significantly from those seen in an intensive care unit, especially during the pandemic.

As a main limitation of the study, we must mention that the survey was conducted in a monovalent cardiology institution were very few patients suffered from COVID-19. The results could differ with respect to



cardiology residents that work in general hospitals where the impact of the disease was greater. In addition, the absence of statistical significance in some results could be due to the low number of participants included. We did not perform a test for paired samples or dependent variables as the board suggested that there should be no way to identify the resident in order to ensure an honest response, with the negative impact of the impossibility of making paired analyses.

## Conclusion

The COVID-19 pandemic was not associated with an increase in the incidence of burnout in cardiology residents. The prevalence of burn out syndrome is already considerable, therefore even though it did not increase during the pandemic we emphasize the importance of creating prevention strategies aimed at improving residents' working conditions, quality of life, quality of learning and patient's safety especially in periods of high stress and workload such as a global health emergency, in order to decrease the prevalence of BO among medical residents.

## Author Contribution

Rocio C. Baro Vila, MD: Conceptualization (lead); writing – original draft (lead); formal analysis (lead); writing – review and editing (equal); Lucrecia M. Burgos, MD: writing – review and editing (equal); Alan Sigal, MD: review and editing (equal); Juan Pablo Costabel, MD: Conceptualization (supporting); Writing – original draft (supporting); Alberto Alves de Lima, MD: writing – review and editing (equal).

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