

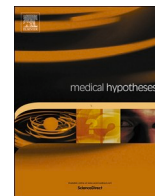


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## Medical Hypotheses

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## Burnout syndrome in Romanian medical residents in time of the COVID-19 pandemic

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### ABSTRACT

Burnout is a state of physical or mental collapse caused by overwork or stress. Burnout during residency training has gained significant attention secondary to concerns regarding job performance and patient care. The new COVID-19 pandemic has raised public health problems around the world and required a reorganization of health services. In this context, burnout syndrome and physical exhaustion have become even more pronounced. Resident doctors, and especially those in certain specialties, seem even more exposed due to the higher workload, prolonged exposure and first contact with patients. This article is a short review of the literature and a presentation of some considerations regarding the activity of the medical residents in a non-Covid emergency hospital in Romania, based on the responses obtained via a questionnaire. Burnout prevalence is not equal in different specialties. We studied its impact and imagine the potential steps that can be taken in order to reduce the increasing rate of burnout syndrome in the pandemics.

### Introduction

The burnout syndrome in health care professionals has a significant attention over the last period. Clinicians are particularly susceptible to developing this syndrome more than in other jobs. Residency can cause a significant degree of burnout, leading to individuals' ability to establish correct communication with the patient, solve diagnostic dilemmas, and have a good overview of the correct treatment. Burnout is described as a variety of negative consequences including depression, risk of medical errors, and negative effects on patient safety. The aim of our article is to describe the prevalence in different specialties of the burnout

syndrome, even more pronounced in Covid context, provide team leaders with options to minimize the risks and prevalence and recognize its potential hazards towards the medical act and its medical caregiver [1]. Although reported and discussed long before the pandemic, after its outbreak, burnout syndrome became even more pregnant [2].

The coronavirus epidemic broke out in Wuhan, China, in a metropolis of 11 million people in December 2019 [3]. Free movement of people led to the spread of the virus in Europe (Italy), the United Kingdom and the United States in January-February 2020, becoming soon a pandemic that affected almost all countries [4].

Resident physicians often represent the communication interface

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between the attending physician and the patient, so that the time spent with the patient is often longer. In the context of the pandemic, physical fatigue is added to the mental stress associated with a possible infection. Resident physicians have the most prolonged contact with patients, including in the time window from the testing moment to the arrival of the result for SARS-CoV-2, therefore the stress is even more pronounced.

Some physical factors are added to the equation. Prolonged wearing of personal protective equipment, excessive heat provided by them, lack of hydration, alimentation, sleep deprivation, all together accentuate fatigue and the burnout syndrome. From this point of view, the most affected doctors are from the emergency units, radiology, intensive care units, but also from the specialties that ensure surgical, obstetrical, orthopedic and neurosurgery emergencies.

The modification of the shifts and of the work schedule, of the type of the current activity, the time and the technique of dressing and undressing the protective equipment, all constitute the novelty that adds an additional stress factor.

Last, but not the least, wearing facial protection equipment leads to a depersonalization of the activity, both in contact with patients and medical staff. The impossibility of reading facial expressions, the lack of interpersonal interactions and facial expressions decreases the possibility of socialization and mutual encouragement. In this sense, the idea related to wearing a photo of the holder on the protective suit appeared.

There are studies that paradoxically indicate a higher level of stress in regular, non-Covid wards of hospitals, compared to front-line ones [5]. A possible explanation would be that better organization and a sense of control reduce the stress level of those in the front line, while the fear of being exposed when the protocols do not seem perfect is higher in non-Covid wards. Here, however, there is a permanent threat of a positive patient, so no one seems to be safe.

Some studies in China and UK have also revealed depression and anxiety due to the COVID-19 outbreak that medical staff experienced [6–8].

The pandemic has led to numerous cases of depression and anxiety, as well as worsening pre-existing mental illnesses [9].

### What is the burnout syndrome and how does it impact medical residents

Burnout was first described by Herbert Freudenberger [10] in 1974, who was a psychologist. In his article, he analyzed dissatisfaction with work, related to stress. In this perspective, burnout syndrome in medical workers can be defined as the state of physical and mental exhaustion felt as a result of medical care provided to others. An exhaustive and analytical definition, characterizes burnout through three constituent elements. One is represented by emotional exhaustion (overextension and exhaustion). The other two are: depersonalization (characterized by a detached, negative attitude, detached interactions with others) and the feeling of decreased personal accomplishment (feelings of incompetence and lack of accumulation during work) [11]. For the evaluation of burnout in the field of work, the most used questionnaire is Maslach Burnout Inventory (MBI) [12]. The MBI questionnaire contains 22 items, was specially designed to measure burnout in workers and represents the “gold standard” in this field [13]. The answer to each item in the MBI questionnaire (sample items such as: “I feel emotionally drained from my work.”) is assigned on a Likert scale to a number between 0 and 6 (“0” means never, “1” corresponds to a few times per year, “2” once monthly, “3” few times per month, “4” once weekly, “5” few times per week, and respectively “6” - daily). The MBI questionnaire was designed to evaluate the three defining components of burnout syndrome: emotional exhaustion, depersonalization, and personal accomplishment. For each defining component, a cutoff value was calculated, statistically, in a study that included 1104 subjects, professionals in health care services [14]. Thus, emotional exhaustion is considered elevated at a value of minimum 27, depersonalization score is considered high at minimum 10, whereas personal accomplishment is low for a value below

or equal to 33. A study in China, comparing burnout of front line workers with that of normal ward staff, in COVID context, used Maslach questionnaire for medical workers and the results were interesting and quite unexpected [3].

Martini et al [15], in 2004, applying the MBI score, thought to compare the frequency of burnout among different medical specialties. They found an overall rate of 50%, with limits of 27% and 75%, depending on the specialties. The differences between the specialties had no statistical significance in their study. They found the highest rate of 75% in obstetrics-gynecology. The following burnout frequencies were, as follows: 63% for internal medicine, 63% for workers in neurology, 60% in ophthalmology, 50% for dermatology, 40% for general surgery practitioners, 40% in psychiatry, and the lowest rate, of 27% was found for family medicine. The identified risk factors for burnout were: individual mood, added family stress, marital status of being single, dissatisfaction with clinical faculty and the first year of medical residency [15]. In psychiatric residents, additional factors related to the specifics of patients were identified: their violence and suicidal tendencies [16–20]. Regarding the impact of burnout on the quality of work, Fahrenkopf et al [21], could not demonstrate correlations between the presence of burnout and the frequency of medical errors. A possible explanation would be that resident doctors, especially in their first year, with a higher frequency of burnout, are less willing to admit their mistakes.

In this pandemics, there is a need for practical methods to assess medical staff burnout. Some researchers have even proposed the continuous wearing of sensors to quantify fatigue [22].

### The hypothesis

The purpose of our study was comparing the frequencies of burnout syndrome among medical residents considered to work on the front line (emergency unit, radiology and intensive care unit) and those working in normal hospital wards (surgery, obstetrics and gynecology, orthopedics). Our hypothesis that we wanted to prove is that there is higher prevalence of burnout syndrome in regular, non-Covid wards of hospitals, compared to front-line ones.

### Evaluation of hypothesis

The study was conducted in a hospital with an emergency clinical profile, which is not in the frontline in the fight against coronavirus, ensuring non-covid emergencies or suspects until the result of the real time polymerase chain reaction test is obtained. During the pandemic, the teaching processes in the hospital were stopped, both for medical students and residents, opting for online teaching. Students’ access to the hospital was stopped by a university decision to limit the spread of the infection. The medical residents continued to carry out medical activity, restricted to the activity in this only hospital where they have an employment contract.

We distributed a survey of 30 questions to 100 medical residents, 50 for resident doctors in the emergency department, radiology and intensive care unit (considered first-contact with suspected or positive patients) and 50 for resident doctors in other specialties (surgery, gynecology, orthopedics). The survey was conducted between 27th of April and 8th of May 2020. The questionnaires included 8 general demographic questions (like gender, age, marital status, members of the same family living together in the same house), and 22 items of Maslach Burnout Inventory-Medical Personnel (MBI) (mental personal perceptions after the beginning of the pandemic - after 1st of March 2020).

The literature search was made after the key words, between 1970 and 2020, searching Pubmed, Google Scholar, Web of Science and Scopus. We selected the most relevant papers related to the subject.

The study was performed according to the Declaration of Helsinki of the World Medical Association, also respecting the national legislation, using a protocol approved by the local Bioethics Committee. All subjects

have previously signed an informed written consent about future publication of data.

## Results

The 50 questionnaires for first-line medical resident were distributed as follows: 30 for residents in emergency unit, 10 for residents in intensive care unit and 10 for residents in radiology department (lot A).

The other 50 questionnaires were distributed in that we considered normal wards. They were allocated for residents in general surgery (25 questionnaires), gynecology (15) and orthopedics (10) - lot B in our study.

All participants completed anonymously the survey's form and all their responses were complete and clear, so that they could be counted in our study.

Demographics characteristics can be found in [table 1](#).

Demographic characteristics showed that the two groups were relatively homogeneous in terms of distribution by age and gender. The extreme ages were 24 and 35 years, respectively, given that the target was represented by resident doctors.

Burnout was considered as fulfilling one of the three criteria: an elevated level of emotional exhaustion ( $\geq 27$ ), and/or a high score for depersonalization ( $\geq 10$ ), and/or a low personal accomplishment score ( $\leq 33$ ).

According to our results, we obtained an average burnout for medical residents of 76%, about two months after the outbreak of the pandemics in our country, which is superior to studies conducted in normal periods. The global prevalence of burnout syndrome among medical residents is high, proving that the threat posed by SARS-CoV-2 is a major stressor for medical staff. The results are all the more worrying as the target group was represented by resident doctors, of young age (maximum 35 years), who, at least theoretically, should have a better adaptability to the new condition represented by this pandemics, compared to senior doctors.

The burnout was significantly more frequent in normal wards workers (lot B) (prevalence 86%) compared to medical residents working in places that we considered front-line departments: emergency unit, radiology, including CT/MRI department and intensive care unit - lot A in our study, that showed a prevalence of burnout of only 66% ( $p < 0.05$ , from chi-square statistic test) ([table 2](#)). We considered emergency unit, radiology, including CT/MRI department and intensive care unit as front-line departments as all the patients, at presentation time, are now considered potentially infected ones till invalidation by a negative real time polymerase chain reaction test that usually takes 24 h in our hospital. The prolonged time is due to the fact that this test is analyzed in an external laboratory.

## Consequences of the hypothesis and discussion

### Fighting the burnout syndrome in pandemics

There can be an array of methods that can be used to fight against the

**Table 1**

Demographics characteristics of the two lots.

	Lot A (N = 50)	Lot B (N = 50)	Total (N = 100)
Mean age (standard deviation)	27,92 (2,663)	27,8 (1,905)	27,86 (2,305)
Sex ratio (M:F)	1,5	1,27	1,38
<b>Specialty</b>			
Emergency unit	30		30
Intensive care	10		10
Radiology	10		10
General surgery		25	25
Obstetrics and Gynecology		15	15
Orthopedics		10	10

**Table 2**

Characteristics of burnout syndrome elements of the two lots.

	Lot A	Lot B	
Emotional exhaustion	18	25	
Depersonalization	4	5	
Low personal accomplishment	11	13	
<b>Total (Burnout frequency)</b>	33 (66%)	43 (86%)	P = 0.019208

burnout syndrome. In a 200 participants cohort study, Maslach [23] showed that workers could decrease personal anxiety by speaking with their colleagues about their worries and taking a more optimistic and joy attitude. In conditions of social distancing, even between colleagues, all these mechanisms are annulled. The place of direct socialization is partially replaced by social media groups and net socialization.

There are no studies on suggested interventions for reducing the prevalence or how it works on each individual. Each person is different genetically, racially, different sex and culture, different family environment and so on. With these many factors comes the problem of pinpointing the trigger factor for each individual. That is why with these many stress factors comes a multitude of anti-stress factors which can be used: from physical activity to meditation. Coordination of residents in the training process can be useful in this regard [24,25].

Staff burnout syndrome has a number of negative consequences for patients. It increases the risk of medical errors and patient safety and can even compromise the quality of the medical act. Fatigue and burnout can affect the caution of medical staff, lead to negligence on self-protection measures and increase the risk of infection. The negative consequences of burnout syndrome on medical staff can include depressive syndromes, even with suicidal thoughts. Burnout syndrome can even lead to physical illnesses. The problems of medical errors related to fatigue and burn-out syndrome seem to be more serious for the surgical specialties [26]. Effective measures must be taken to combat the burnout syndrome, both at the institutional level and at the individual level [1].

In a previous study conducted in our hospital, in non-pandemic conditions, the conclusion was that surgeons' fatigue seems to be a more subjective self-perception of surgeons than an objective fact and that surgeons tend to attribute their mistakes to burn-out syndrome, this being more acceptable for their conscience. In normal times, the rates of complications were not statistically higher on call-days and the days immediately after, when exhaustion should be maximum [27].

Maslach [28] conclude the effective fight against the burnout by the phrase: "If all of the knowledge and advice about how to beat burnout could be summed up in 1 word, that word would be balance-balance between giving and getting, balance between stress and calm, balance between work and home."

## Discussion

Pandemics of this magnitude have appeared in humanity about once every 100 years [29]. So you cannot talk about personal experience in managing a crisis like this. It is also difficult to assume that the competent centralized structures, such as governments, public health organizations, could fully manage the situation at individual level. In certain critical situations, it even turned out that local authorities, along with the population, had more competent organization and involvement (the example of hurricanes). In our opinion, the local organization at the hospital level is much more important for decreasing the stress level and the prevalence of the burnout syndrome. The existence of clear protocols for any possible situation, the practical trainings with the personnel regarding the protection measures, the adequate use of the protection equipment are all measures that ensure a state of confidence and control, which obviously decreases the stress level. This could explain the higher prevalence of burnout syndrome in staff in regular wards, compared to employees in the emergency department. Medical residents in

emergency unit had more training hours about the protective equipment and the wearing of the personal protection equipment was continuous, throughout the working time, that gave them the feeling of being safe, reducing the stress.

All the successes of medical teams must be promoted by all means, being a source of positive emotions. The shift program must be organized in such a way as to respect the epidemiological timing (incubation period or quarantine time). Periods of rest and relaxation are important and must be observed to prevent burnout, even if, often, they cannot take place in the privacy of families.

## Conclusions

The burnout-syndrome is a real phenomenon and may manifest in many forms. Each resident and other higher level caregiver is susceptible to it. Being aware of this, the new physician generations are shown to have an attraction towards balancing activities. All in all medical leaders and mentors should be aware of their colleagues and residents, thus allowing themselves to partake in the well-being of the team and making the work environment less stressful. The research in individual stress-factors and its many ways in which to actively fight them it is a gateway to making a whole medical environment better by concentrating upon the individual and giving a successful education to the next generation of physicians.

In the context of COVID-19, the best way to combat burnout seems to be, in our opinion, the precise local organization within the hospital and practical training sessions on the use of personal protective equipment, source of a mental comfort feeling.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.mehy.2020.109972>.

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