

Volume 10, n 1, 2022

Clinical Psychology

## Latent burnout profiles in a sample of frontline healthcare professionals after the peak of the Italian COVID-19 pandemic

Giuseppe Maniaci <sup>1</sup>§\*, Caterina La Cascia <sup>1</sup>§, Alessandra Giammanco <sup>1</sup>§,  
Cristiana Maria <sup>1</sup>, Laura Ferraro <sup>1</sup>, Giada Tripoli <sup>1</sup>, Alessandra Scaglione <sup>1</sup>,  
Crocettarachele Sartorio <sup>1</sup>, Fabio Seminerio <sup>1</sup>, Francesca Toia <sup>2</sup>, Daniele La Barbera <sup>1</sup>

### Abstract

**Background:** In Italy since February 2020, the unexpected massive afflux of COVID-19 patients exposed healthcare professionals to high work-related stress, high time pressure and increased the risk of being infected. This is the first study that aimed to investigate the psychological impact of COVID-pandemic at the end of the peak, by identifying latent burnout profiles in a sample of front-line healthcare professionals that worked in Italy during the peak of the pandemic.

**Methods:** A total of 589 subjects filled in an online ad-hoc questionnaire and the Italian version of Maslach Burnout Inventory - Human Services Survey.

**Results:** A higher presence of burnout profile in healthcare professionals who worked in frontline during the peak of the COVID-19 pandemic was highlighted. Furthermore, those professionals showed significantly higher perceived stress levels, increase of worries, and sleep problems, they were more likely to underline the importance of team spirit and to consider asking for psychological support. A multiple regression analysis revealed that age, managing COVID-19 patients, perceived stress levels, adequacy of training, and considering to ask for psychological support significantly predicted latent burnout profiles. Moreover, perceived stress levels mediate the relationship between those profiles and managing COVID-19 patients.

**Conclusions:** These findings highlight how stressful and damaging the pandemic has been, especially for people directly involved in the care of patients tested positive for COVID-19. Furthermore, it provides evidence for the importance of investing in wellness for healthcare professionals, in order to avoid shortage due to burnout and to guarantee optimal standards of care to all patients.

<sup>1</sup> Section of Psychiatry, Department of Biomedicine, Neuroscience, and Advanced Diagnostic, University of Palermo, Palermo, Italy

<sup>2</sup> Department of Surgical, Oncological and Oral Sciences, University of Palermo, Palermo, Italy

§ Giuseppe Maniaci, Caterina La Cascia and Alessandra Giammanco equally contributed to this work; they are first authors of the study

E-mail corresponding author: [giuseppe.maniaci02@unipa.it](mailto:giuseppe.maniaci02@unipa.it)



### Keywords:

COVID-19; Healthcare professionals; Latent burnout profiles; Burnout; Stress levels.

**Received:** 17 December 2022

**Accepted:** 21 April 2022

**Published:** 29 April 2022

**Citation:** Maniaci, G., La Cascia, C., Giammanco, A., Maria, C., Ferraro, L., Tripoli, G., Scaglione, A., Sartorio, C., Seminerio, F., Toia, F., La Barbera, D. (2022). Latent burnout profiles in a sample of frontline healthcare professionals after the peak of the Italian COVID-19 pandemic. *Mediterranean Journal of Clinical Psychology*, 10(1). <https://doi.org/10.13129/2282-1619/mjcp-3292>

## 1. Introduction

Coronavirus disease 2019 (COVID-19) is an infectious respiratory illness caused by a newly identified coronavirus (SARS-CoV-2) which appeared for the first time in Wuhan, China, in December 2019, and has resulted in the first pandemic sparked by a coronavirus (WHO, 2020). The most common symptoms of COVID-19 are fever, cough, and tiredness; other less common symptoms include nasal congestion, headache, loss of taste or smell, severe difficulty breathing/shortness of breath, and chest pain/pressure (WHO, 2020b). Moreover, adverse mental health impact has been reported in patients with SARS-CoV-2 (Moroianu et al., 2021), especially in healthcare workers, such as nurses and physician trainees (García-Fernández et al., 2022). To date (March 26, 2022), 193,241,723 cases and 1,918,389 deaths were reported in Europe (WHO, 2022a); of those, 14,153,098 cases and 158,436 deaths were recorded in Italy (WHO, 2022b).

COVID-19 can be transmitted through close contact, respiratory droplets and by touching a surface contaminated with the virus (Italian Ministry of Health, 2020). On February 2020, several COVID-19 cases were detected in the northern of Italy and, despite containment strategies, the virus continued to spread out all-over Italy, with several consequences on mental health (Commodari et al., 2021; Frisone et al., 2020; Gori et al., 2021): a recent study underlined that the first lockdown contributed to emotional distress and regressive mechanisms in Italian children in the contest of higher parental discomfort, fear of the infection and avoidant communication (Ferraro et al., 2021). In this regard, it was showed that a key-role was played by mental distress: since psychologically distressed individuals could perceive less fear of getting infected, they could be exposed to at-risk behaviors that could increase the risk of contracting the COVID-19 (Veronese et al., 2021). Moreover, people who do not show any symptom can transmit the virus; therefore, healthcare professionals are at high risk of exposure (Koh, 2020; Semple & Cherrie, 2020).

The sudden and unexpected massive afflux of patients became a serious problem for healthcare professionals (Remuzzi & Remuzzi, 2020), who maximized their efforts in order to provide assistance to all the patients by increasing their working hours, and saw many colleagues being infected with or dying of COVID-19.

Burnout can be defined as a prolonged, maladaptive response to chronic emotional and interpersonal stressors on the job, which is characterized by three dimensions: emotional exhaustion, cynicism or depersonalization, and inefficacy or reduced personal accomplishment

(Maslach et al., 2001). Recently, in a person-centered approach-based analysis, Leiter and Maslach (2016) identified five latent burnout profiles: Burnout (high on all three dimensions) and Engagement (low on all three dimensions) represents the two endpoint profiles on the continuum, while Overextended (high on emotional exhaustion only), Disengaged (high on depersonalization only), and Ineffective (high on inefficacy only) profiles are the three intermediate ones.

Lack of organizational support, high work-related stress, high time pressure and workload are well-known factors associated with burnout among frontline primary healthcare providers (Dugani et al., 2018). A wide range of employee groups can experience burnout, such as teachers (Alfuqaha & Alsharah, 2018), athletes (Giusti et al., 2020), police officers (Peterson et al., 2019), and driver-rescuers (Ferraro et al., 2020); however, exposure to COVID-19 patients can be an important risk factor for the onset of burnout among healthcare professionals (Morgantini et al., 2020).

Indeed, a recent study conducted during the COVID-19 pandemic highlighted that Italian healthcare professionals directly involved in the care of those patients reported work-related psychological pressure and frequent somatic symptoms, and in that sample it was found a significantly higher percentage of workers with higher levels of emotional exhaustion than the one found in other Italian samples during the SARS pandemic (Barello et al., 2020). Moreover, several studies analyzed long-term psychological effects on healthcare professionals after the 2003 SARS outbreak, showing that individuals reported significantly high levels of burnout, psychological distress (Mauder et al., 2006), and post-traumatic stress symptoms (Mauder et al., 2006; Wu et al., 2009).

In this proposal, a recent systematic review and qualitative meta-synthesis based on 46 studies showed that healthcare workers, as in previous pandemics or epidemics, were deeply concerned about their own and/or others' physical safety, especially because of inadequate personal protective equipment, insufficient resources, and inconsistent information. Moreover, healthcare professionals were exposed to high workloads and long shifts, and their social relationships could be experienced concomitantly as sources of support as well as sources of stress (Billings et al., 2021).

Several studies underlined that during pandemic healthcare professionals experienced sleep problems, moderate and severe stress (Jahrami et al., 2021), and changes in their routine and habits (Mota et al., 2021); furthermore, frontline nurses who reported not having attended COVID-19-related training reported increased fears of COVID-19, which was associated with

decreased job satisfaction, increased psychological distress and increased organizational and professional turnover intentions (Labrague & de Los Santos, 2021). However, an interesting study underlined that, despite the overall low levels of mental wellbeing in healthcare professionals, use of any formal support was quite low, whereas 96% of the sample reported using at least one informal source of support (Ménard et al., 2022).

### **1.1 Aims of the study**

Given these premises, the aim of the present study was to investigate the psychological impact of COVID-19 pandemic on Italian frontline healthcare professionals by identifying latent burnout profiles comparing them to those who worked in a hospital unit COVID-19 free. Specifically, it was hypothesized to observe a significantly higher presence of burnout syndrome and other symptoms of psychological stress in 4 healthcare professionals who were exposed to patients with 95 COVID-19 compared to those who were not exposed to. Moreover, starting from these hypotheses, the role of managing patients tested positive for COVID-19, the increase of perceived stress levels, sleep problems, the importance of team spirit, the adequacy of training, and considering to ask for psychological support was explored, in order to predict latent burnout profiles, taking into account age and gender. Finally, in order to further understand the relationships between these variables, we had hypothesized a specific indirect effect of perceived stress levels on the relationship between the management of COVID-19 patients and latent burnout profiles.

## **2. Materials and Methods**

### **2.1 Procedure and Participants**

An online survey was developed and hosted online using Google Forms. The survey was posted from June to July 2020 on the most popular Facebook groups about healthcare professions, with a short description about the aim of the study and a link to the online questionnaire. Participants were recruited if older than 20 years old, working as healthcare professionals in Italy and able to give their informed consent to participate. Participants provided electronic informed consent prior to the survey and were free to quit it at any time.

The study was presented as an investigation of work-related stress experienced by healthcare professionals during the COVID-19 emergency, and individuals were asked to answer self-report questionnaires anonymously after accepted the online informed consent. All participants were assigned a random number in the survey by the server, and they didn't have to fill out the name. This study complied with all the ethical guidelines and standards for online surveys with

human participants, in accordance with the local legislation. All procedures performed were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Declaration of Helsinki and its later amendments. This study was approved by the ethical review board of the Polyclinic “P. Giaccone”, Palermo, Italy (Verb N° 06/2020).

## **2.2 Measures**

### **2.2.1 Socio-demographic variables and COVID-19 emergency experience questionnaire**

An ad hoc socio-demographic questionnaire was administered in order to get information about age, sex, nationality, occupation, the current hospital unit they were employed and length of employment in that unit.

Participants were asked: if during the pandemic they worked with patients tested positive for COVID-19; if they considered to ask for psychological support after COVID-19 emergency and, if so, if they received any information about the existence of any counselling service; furthermore, they were asked if they considered about taking time off work after the emergency. Individuals who affirmed that they worked with patients with COVID-19 were also asked how much that experience increased their worries.

Moreover, all the participants were asked to answer to the following questions on a 4-point Likert scale (from 0 = “very little” to 3 = “a lot”): “Did you feel more stressed than usual at work?”; “How much did the COVID-19 pandemic change your everyday habits?”; “Did you experience any sleep problems during the emergency?”; “How much important is team spirit in order to deal with the emergency?”; “Do you think that your team has been adequately trained to deal with the emergency?”.

### **2.2.2 Maslach Burnout Inventory - Human Services Survey (MBI-HSS)**

The Italian version of the Maslach Burnout Inventory - Human Services Survey (MBI-HSS) (Sirigatti & Stefanile, 1988) was used in order to assess burnout. The MBI-HSS is a 22-item self-report questionnaire with a 7-point frequency rating scale (from 0 = “never” to 6 = “every day”) which assesses three dimensions: emotional exhaustion, cynicism, and professional efficacy.

According to Leiter and Maslach (2016), the individuals were classified by their exact latent burnout profile. Specifically, an “Engagement” profile – the most positive experience - is characterized by high scores at efficacy and low scores at emotional exhaustion and cynicism, while “Burnout” profile – the most negative one - is found when scores at emotional exhaustion and cynicism are high, and scores at efficacy are low. The “Disengaged” profile, which is closer

to the Burnout profile, is present when high scores are found in cynicism only and moderate scores are found in the other subscales. The “Over-extension” and “Inefficacy” profiles were characterized by high scores in emotional exhaustion and low efficacy only, respectively. Finally, participants presenting high or moderate scores on emotional exhaustion and cynicism, with medium or low inefficacy, were considered as moderate burnout.

### **2.3 Statistical Analyses**

A chi-squared test was used to evaluate significant differences between healthcare professionals who worked with COVID-19 patients and ones who were not exposed to those patients in relation to all categorical variables taken into account. Moreover, a correlation analysis was performed using the Pearson correlation coefficient, to evaluate the presence of a possible linear relationship between stress levels and latent burnout profiles. A multiple regression analysis was conducted in order to examine how management of patients tested positive for COVID-19, the increase of perceived stress levels, sleep problems, importance of team spirit, adequacy of training, and considering to ask for psychological support varied in relation to latent burnout profiles while controlling for age, gender, and any potential interaction effects between these variables. Last, the PROCESS 3.5 macro for Statistical Package for the Social Sciences (SPSS) (Hayes, 2013) was employed to explore the mediation indirect effects. In the mediation analysis, gender and age were treated as covariates in the model, to work with COVID-19 patients was selected as the independent variable, latent burnout profiles as the outcome variable, and perceived stress levels were treated as mediator. A 5,000 bootstrap samples were used.

All statistical analyses were performed in the Statistical Package for the Social Sciences for Windows 22.0 and assumed an alpha risk of 5%.

## **3. Results**

### **3.1 Descriptive analysis**

A sample of 597 volunteers participated in this study; 8 of them were excluded since they did not complete the survey. Thus, a final sample of 589 individuals was obtained. Table 1 shows the socio-demographic and work-related characteristics of the participants.

Most of the participants (67.06%) worked with COVID-19 patients, whereas 32.93% of participants reported that they were not exposed to.

**Table 1.** Socio-demographic and work-related characteristics of participants.

Socio-demographic characteristics	N (%)	M (SD)
Age	-	39.92 (10.59)
Gender		
Male	120 (20.37%)	-
Female	469 (79.63%)	
Nationality		
Italian	577 (98.29%)	
Romanian	4 (0.68%)	
Iranian	1 (0.17%)	-
Swiss	1 (0.17%)	
Peruvian	1 (0.17%)	
Albanian	1 (0.17%)	
Italian-Albanian	1 (0.17%)	
Occupation		
Nurse	526 (89.60%)	
Rescuer	15 (2.55%)	
Physician	12 (2.04%)	
Patient care assistant	9 (1.53%)	
Psychologist	8 (1.36%)	-
Obstetrician	8 (1.36%)	
Physiotherapist	3 (0.51%)	
Pharmacist	2 (0.34%)	
Healthcare assistant	2 (0.34%)	
Radiologic technician	1 (0.17%)	
Podiatrist	1 (0.17%)	
Length of employment		
- 5 years	239 (40.78%)	
5 - 10 years	106 (18.08%)	-
10 years +	241 (41.12%)	
Workplace		
Emergency room	98 (18.28%)	
Medicine unit	79 (14.73%)	
Surgery unit	72 (13.43%)	
Intensive care unit	58 (10.82%)	
Resident care facility	33 (6.15%)	

<b>Local health authority</b>	23 (4.28%)	
<b>Hospice care and nursing home</b>	22 (4.10%)	
<b>Infectious diseases unit</b>	21 (3.91%)	-
<b>Oncology unit</b>	12 (2.23%)	
<b>Obstetrics and gynecology unit</b>	12 (2.23%)	
<b>Private clinic and integrated home care service</b>	12 (2.23%)	
<b>COVID-19 unit</b>	10 (1.86%)	
<b>Nephrology unit</b>	10 (1.86%)	
<b>Urology unit</b>	9 (1.67%)	
<b>Pediatric unit</b>	8 (1.49%)	
<b>Geriatric unit</b>	7 (1.30%)	
<b>Neurological unit</b>	7 (1.30%)	
<b>Rehabilitation unit</b>	7 (1.30%)	
<b>Cardiology unit</b>	7 (1.30%)	
<b>Self-employed</b>	6 (1.11%)	
<b>Radiology unit</b>	5 (0.93%)	
<b>Psychiatry unit</b>	3 (0.55%)	
<b>Bone marrow transplant unit</b>	3 (0.55%)	
<b>Ophthalmology unit</b>	3 (0.55%)	
<b>Pharmacy</b>	2 (0.37%)	
<b>Prison</b>	2 (0.37%)	
<b>Rheumatology unit</b>	1 (0.18%)	
<b>Pneumology unit</b>	1 (0.18%)	
<b>Otolaryngology unit</b>	1 (0.18%)	
<b>Diabetology unit</b>	1 (0.18%)	
<b>Dermatology unit</b>		

### 3.2 Latent burnout profiles and psychological impact of COVID-19 pandemic

A higher presence of Burnout profile in healthcare professionals directly involved in the care of patients with COVID-19 emerged, while an opposite result was found regarding the Ineffective profile and the Engagement profile  $\chi^2(5) = 26.7, p < .000$ . No statistically significant differences were found among Overextended, Disengaged, and Moderate burnout profile. Furthermore, higher stress levels were reported by healthcare professionals who worked with COVID-19 patients  $\chi^2(3) = 18.9, p < .000$ . Moreover, according to our hypothesis, data analysis revealed that latent burnout profiles were positively correlated with perceived stress levels both in



professionals who managed COVID-19 cases  $r = .220, p < .000$  and in the group who was not exposed to  $r = .304, p < .000$ .

A significant difference between groups emerged regarding severe sleep problems  $\chi^2 (3) = 16.8, p = .001$ . Specifically, individuals who cared for patients with COVID-19 reported more sleep problems compared to the other group. A statistically significant difference was observed in relation to the importance of team spirit  $\chi^2 (3) = 14.9, p = .002$ . Indeed, both groups reported the importance of working together as a team, but it was more relevant for healthcare providers who had to work on the front line of the COVID-19 emergency.

Moreover, professionals who treated COVID-19 patients were more likely to consider to ask for psychological support after the COVID-19 emergency ( $\chi^2 (1) = 21.6, p < .000$ ). In this regard, workers who managed COVID-19 patients were more likely to receive information about the possibility for consulting a counselling service  $\chi^2 (1) = 11.5, p = .001$ .

Furthermore, the two groups differed in relation to the increase of worries associated to the possibility of asking for psychological support  $\chi^2 (4) = 16.6, p = .002$ , and the increase of worries associated to sleep problems  $\chi^2 (12) = 53.7, p < .001$ , respectively. Indeed, individuals who reported an increasing of their worries were more likely to ask for psychological support at the end of the emergency and to complain about extremely severe sleep problems.

Last, a statistically significant difference emerged in relation to the increase of worries associated to perceived stress levels  $\chi^2 (12) = 193.4, p < .000$ . As expected, professionals who reported a massive increasing of their worries also experienced higher severe stress levels compared to their colleagues who were not in contact with COVID-19 cases or were less worried.

No significant differences were found between groups in relation to the change of habits during COVID-19 emergency  $\chi^2 (3) = 5.1, p = .162$ , perception of the adequacy of training received  $\chi^2 (3) = 3.3, p = .346$ , and considering about taking time off work  $\chi^2 (1) = 2.1, p = .143$ .

### **3.3 Predictors and mediator of latent burnout profiles**

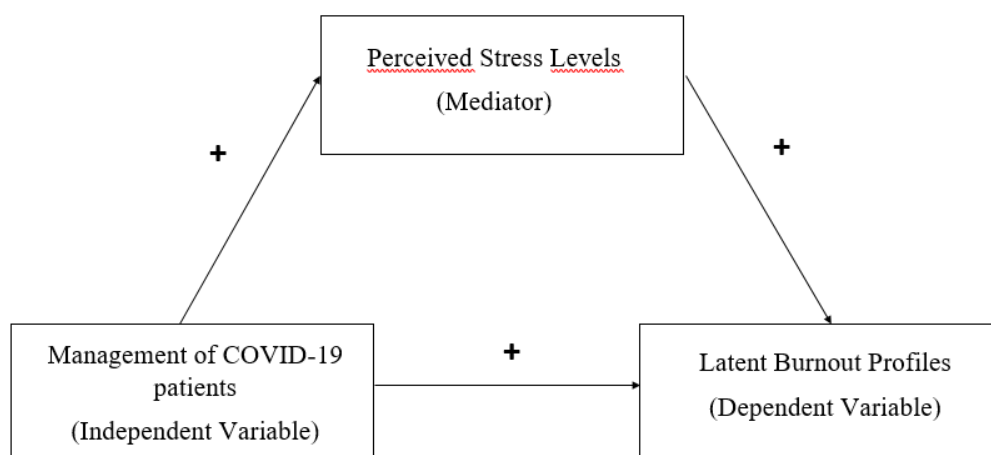
A multiple regression analysis was conducted in order to predict latent burnout profiles based on working with patients tested positive for COVID-19, the increase of perceived stress levels, sleep problems, importance of team spirit, adequacy of training, and considering to ask for psychological support while controlling for age and gender. Multicollinearity was assessed using the variance inflation factor (VIF). No issues of multicollinearity emerged in the model as VIF for all variables is  $< 10$  (Belsley, 1991).

The overall model was significant  $F(8, 558) = 12.257, p < .000$ , and explained 13.7% of the variance, as indexed by the  $R^2$  value. Specifically, it was showed that age [ $b = -.091, t(558) = -2.307, p = .021$ ], to manage COVID-19 patients [ $b = .124, t(558) = 3.016, p = .003$ ], perceived stress levels [ $b = .175, t(558) = 3.877, p < .000$ ], adequacy of training [ $b = -.160, t(558) = -4.012, p < .000$ ], and considering to ask for psychological support [ $b = .108, t(558) = 2.501, p = .013$ ] significantly predicted latent burnout profiles.

Moreover, SPSS PROCESS macro, using “Model 4”, the mediated regression model, was selected in order to explore the role of perceived stress levels as a mediator, while controlling for age and gender.

Our results indicated that the management of COVID-19 patients is indirectly related to latent burnout profiles through its relationship with perceived stress levels [ $b = .435, t(568) = 3.097, p = .002$ ]. A 95% bias-corrected confidence interval based on 5,000 bootstrap samples indicated that the indirect effect ( $b = .137$ ) was entirely above zero (.062 to .236).

As can be seen in Figure 1, professionals who managed COVID-19 cases reported higher stress levels than professionals who did not [ $b = .325, t(568) = 4.108, p < .000$ ], and higher perceived stress levels were subsequently related to the most negative latent burnout profiles [ $b = .424, t(568) = 5.786, p < .000$ ]. Regression of management of COVID-19 patients on latent burnout profiles, ignoring the mediator, was also significant [ $b = .572, t(568) = 4.026, p < .000$ ].



**Figure 1.** Perceived stress levels mediate the relationship between burnout profiles and management of covid-19 patients

#### 4. Discussion

This study aimed to investigate the psychological impact of COVID-19 pandemic at the end of the peak in a sample of front-line healthcare professionals who worked in Italy during the pandemic.

According to our hypotheses, it was found that a significant higher presence of burnout in healthcare workers directly involved in the care of patients with COVID-19. Furthermore, Engagement and Ineffective profiles were observed in those who were not exposed to patients with COVID-19. Our results are in line with those of a recent study conducted on a sample of 2156 individuals during the current COVID-19 pandemic: it was found that the hopelessness and state anxiety levels of healthcare professionals were higher than non-healthcare ones, and that nurses were more psychologically affected than other healthcare professionals (Hacimusalar et al., 2020). In this regard, it is possible that healthcare professionals who did not work with patients tested positive for COVID-19 were not exposed to a massive amount of extreme situations as much as the other group: it was showed that job stressors such as making life prioritizing decisions due to supply shortages and feeling pushed beyond training were associated with burnout during the current pandemic (Morgantini et al., 2020). Moreover, an Italian study highlighted that both organizational, such as workload and job satisfaction, and personal factors, such as mental health, are associated with work engagement in healthcare professionals (Fiabane et al., 2013).

Furthermore, healthcare professionals who were exposed to COVID-19 patients reported higher severe stress levels compared to their colleagues who worked in a hospital COVID-19 free unit, and high stress levels were associated with an increase of worries. According to a recent narrative review, the COVID-19 pandemic generated a climate of wariness and uncertainty among health professionals, due to intrinsic characteristics of the illness, poor knowledge of the disease, and deaths among those professionals. Furthermore, both organizational factors such as depletion of personal protection equipment and the shortage of intensive care unit beds, and individual factors including feelings of being inadequately supported and concerns about oneself and family members' health could increase stress levels in healthcare professionals (El-Hage et al., 2020).

Our data showed that to manage COVID-19 cases was also associated with the occurrence of severe sleep problems, which in turn were associated with an increase of worries. In this regard, there is a strong relationship between stress and sleep (Martire et al., 2019). Furthermore,

according to the American Academy of Sleep Medicine, sleep loss is often overlooked as a contributing factor to physician burnout (Kancherla et al., 2020).

In contrast with Menard et al. (2022), another relevant result was that professionals who worked directly with COVID-19 patients considered to ask for psychological support and they have got information about the presence of counselling services in the hospital where they work. This result is quite encouraging, since it represents an effective coping strategy in order to manage negative feelings and preventing adverse consequences both for mental and physical health. Several studies showed burnout improvements after intervention in health professional populations (e.g., Wei et al., 2017; West et al., 2016), especially during COVID-19 pandemic (e.g., Hooper et al., 2021). Also, it was observed that this workers group is reluctant to disclose about mental health and psychological difficulties such as burnout, and not understanding which support structures are available was identified as an obstacle for asking for psychological support (Clough et al., 2019; Cohen et al., 2016). Conversely, our data showed that healthcare workers directly involved in managing COVID-19 patients sought information on counselling services and this could be an index of awareness of the need for psychological support.

Our results revealed that age, to assist patients positive for COVID-19, increase of perceived stress levels, adequacy of training, and considering to ask for psychological support significantly predicted latent burnout profiles. Young healthcare professionals are particularly susceptible to develop burnout symptoms, probably because of the different mastery of job demands (Marchand et al., 2018). It is well known that nurses' perception about the adequacy of training is associated with all three dimensions of burnout (Mcmillan et al., 2016); receiving a better training at the start of their own career and to be informed about the possibility of asking for psychological support on the workplace could be helpful in order to reduce the risk of burnout and improve workplace wellbeing. Moreover, our results are in line with a recent Italian study on healthcare professionals that found age and being in contact with COVID-19 patients as predictors of burnout dimensions (Giusti et al., 2020).

As expected, our data showed that the relationship between working with COVID-19 patients and latent burnout profiles is mediated by perceived stress levels. This result is in line with those of Kannampallil and colleagues (2020), who showed that trainees who were exposed to COVID-19 patients reported significantly higher stress levels and were more likely to be burned out, and with previous research that underlined that stress (Dugani et al., 2018) and exposure to COVID-19 patients can represent a risk factor for the onset of burnout among healthcare professionals (Morgantini et al., 2020).

This study has some limitations. First, our sample was mainly constituted by nurses and females, so our results could not be generalized to all healthcare professionals. Moreover, the survey did not evaluate some variables which could represent a potential risk or protective factor against burnout, such as social support, number of work hours, availability of adequate personal protective equipment, and the presence of psychiatric disorders, such as anxiety and depression symptoms.

Future longitudinal research could investigate latent burnout profiles in a larger and more heterogeneous sample, in order to promote tailored interventions. Moreover, physiological health outcomes could be evaluated in order to get an integrated assessment. Finally, clinically relevant fears could be assessed through specific questionnaires, such as the Multidimensional Assessment of COVID-19-Related Fears (MAC-RF), in order to easily identify individuals at increased risk of current psychopathology during the COVID-19 pandemic (Schimmenti et al., 2020).

The main strength of this study is to focus, for the first time, in latent burnout profiles of healthcare professionals after the peak of the COVID-19 pandemic in Italy, one of the most severely affected countries by this newly identified coronavirus. It is relevant for governments to invest into the wellness of this healthcare workers, in order to avoid shortage due to burnout and to guarantee optimal levels of care to all patients. Indeed, it would be important to provide psychological support to professionals *during* other eventual pandemic peaks in the future, in order to allow them to manage as well as possible future emergency situations. Furthermore, it would be useful to guarantee to these professionals a psychological support for promoting mental health and reducing the risk of a burnout syndrome.

**Abbreviations:**

COVID-19: Coronavirus disease 2019

SARS: Severe Acute Respiratory Syndrome

MBI-HSS: Maslach Burnout Inventory - Human Services Survey

WHO: World Health Organization

**Conflict of Interest**

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

**Author Contributions**

G. M: Conceptualization, Investigation, Methodology, Writing – original draft, Writing – review & editing, Formal analysis, Resources. C. L. C: Conceptualization, Investigation, Methodology, Writing – original draft, Writing – review & editing, Formal analysis, Resources. A. G: Investigation, Methodology, Writing – original draft, Writing – review & editing, Visualization, Formal analysis, Resources. C. M: Investigation, Formal analysis, Resources. L. F: Writing – review & editing, Resources. A. S: Writing – review & editing, Resources. C. S: Writing – review & editing, Resources. F. S: Writing – review & editing, Resources. G. T: Writing – review & editing, Resources. F. T: Writing – review & editing, Resources. D. L. B: Conceptualization, Project administration, Supervision, Writing – original draft, Writing – review & editing.

**Funding**

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

**8. Ethical approval**

All procedures performed involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Declaration of Helsinki and its later amendments.

## References

1. Alfuqaha, O., & Alsharah, H. (2018). Burnout among nurses and teachers in Jordan: A comparative study. *Archives of Psychiatry and Psychotherapy*, 20(2), 55-65. <https://doi.org/10.12740/APP/80168>
2. Barello, S., Palamenghi, L., & Graffigna, G. (2020). Burnout and somatic symptoms among frontline healthcare professionals at the peak of the Italian COVID-19 pandemic. *Psychiatry Research*, 290, 113129. <https://doi.org/10.1016/j.psychres.2020.113129>
3. Belsley, D. A. (1991). *Conditioning diagnostics: Collinearity and weak data in regression*. New York: Wiley.
4. Billings, J., Ching, B. C. F., Gkofa, V., Greene, T., & Bloomfield, M. (2021). Experiences of frontline healthcare workers and their views about support during COVID-19 and previous pandemics: A systematic review and qualitative meta-synthesis. *BMC Health Services Research*, 21(1), 1-17. <https://doi.org/10.1186/s12913-021-06917-z>
5. Clough, B. A., March, S., Leane, S., & Ireland, M. J. (2019). What prevents doctors from seeking help for stress and burnout? A mixed-methods investigation among metropolitan and regional-based Australian doctors. *Journal of Clinical Psychology*, 75, 418-432. <https://doi.org/10.1002/jclp.22707>
6. Cohen, D., Winstanley, S. J., & Greene, G. (2016). Understanding doctors' attitudes towards self-disclosure of mental ill health. *Occupational Medicine*, 66, 383-389. <https://doi.org/10.1093/occmed/kqw024>
7. Commodari, E., La Rosa, V. L., Carnemolla, G., Parisi, J. (2021). The psychological impact of the lockdown on Italian university students during the first wave of COVID-19 pandemic: psychological experiences, health risk perceptions, distance learning, and future perspectives. *Mediterranean Journal of Clinical Psychology*, 9(2). <https://doi.org/10.13129/2282-1619/mjcp-3009>
8. Dugani, S., Afari, H., Hirschhorn, L. R., Ratcliffe, H., Veillard, J., Martin, G., Lagomarsino, G., Basu, L., & Bitton, A. (2018). Prevalence and factors associated with burnout among frontline primary health care providers in low- and middle-income countries: A systematic review. *Gates Open Research*, 2(4). <https://doi.org/10.12688/gatesopenres.12779.3>
9. El-Hage, W., Hingray, C., Lemogne, C., Yrondi, A., Brunault, P., Bienvenu, T., Etain, B., Paquet, C., Gohier, B., Bennabi, D., Birmes, P., Sauvaget, A., Fakra, E., Prieto, N., Bulteau, S., Vidailhet, P., Camus, V., Leboyer, M., Krebs, M. O., & Auquier, B. (2020). Health professionals facing the coronavirus disease 2019 (COVID-19) pandemic: What are the mental health risks?. *Encephale*, 46(3S), S73-S80. <https://doi.org/10.1016/j.encep.2020.04.008>
10. Fiabane, E., Giorgi, I., Sguazzin, C., & Argentero, P. (2013). Work engagement and occupational stress in nurses and other healthcare workers: the role of organisational and personal factors. *Journal of Clinical Nursing*, 22(17-18), 2614-2624. <https://doi.org/10.1111/jocn.12084>

11. Ferraro, L., La Cascia, C., Daino, M., Tripoli, G., Maniaci, G., Sartorio, C 366., Seminero, F., Lo Baido, R., La Barbera, D. (2021). Children and families' mental health during the first COVID-19 lockdown in Italy. *Mediterranean Journal of Clinical Psychology*, 9(2). <https://doi.org/10.13129/2282-1619/mjcp-2984>
- Ferraro, L., La Cascia, C., De Santis, A., Sideli, L., Maniaci, G., Orlando, I. M., Chifari, A., Maniaci, L., & La Barbera, D. (2020). A cross-sectional survey on burnout prevalence and profile in the Sicilian population of ambulance driver-rescuers. *Prehospital and Disaster Medicine*, 35(2), 133–140. <https://doi.org/10.1017/S1049023X20000059>
12. Frisone, F., Alibrandi, A., Settineri, S. (2020). Problem gambling during Covid-19. *Mediterranean Journal of Clinical Psychology*, 8(3). <https://doi.org/10.6092/2282-1619/mjcp-2457>
13. García-Fernández, L., Romero-Ferreiro, V., López-Roldán, P. D., Padilla, S., Calero-Sierra, I., Monzó- García, M., Pérez-Martín, J., & Rodríguez-Jimenez, R. (2022). Mental health impact of COVID-19 pandemic on Spanish healthcare workers. *Psychological Medicine*, 52(1), 195-197. <https://doi.org/10.1017/S0033291720002019>
14. Giusti, E. M., Pedroli, E., D'Aniello, G. E., Stramba Badiale, C., Pietrabissa, G., Manna, C., Stramba Badiale, M., Riva, G., Castelnuovo, G., & Molinari, E. (2020). The psychological impact of the COVID-19 outbreak on health professionals: A cross-sectional study. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.01684>
15. Giusti, N. E., Carder, S. L., Vopat, L., Baker, J., Tarakemeh, A., Vopat, B., & Mulcahey, M. K. (2020). Comparing burnout in sport-specializing versus sport-sampling adolescent athletes: A systematic review and meta-analysis. *Orthopaedic Journal of Sports Medicine*, 8(3). <https://doi.org/10.1177/2325967120907579>
16. Gori, A., Topino, E., Craparo, G., Lauro Grotto, R., Caretti, V. (2021). An empirical model for understanding the threat responses at the time of COVID-19. *Mediterranean Journal of Clinical Psychology*, 9(1). <https://doi.org/10.6092/2282-1619/mjcp-2916>
17. Hacimusalar, Y., Kahve, A. C., Yasar, A. B., & Aydin, M. S. (2020). Anxiety and hopelessness levels in COVID-19 pandemic: A comparative study of healthcare professionals and other community sample in Turkey *Journal of Psychiatric Research*, 129, 181-188. <https://doi.org/10.1016/j.jpsychires.2020.07.024>
18. Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York: The Guilford Press.
19. Hooper, J. J., Saulsman, L., Hall, T., & Waters, F. (2021). Addressing the psychological 394 impact of COVID-19 on healthcare workers: learning from a systematic review of early interventions for frontline responders. *BMJ Open*, 11(5), e044134. <https://doi.org/10.1136/bmjopen-2020-044134>
20. Italian Ministry of Health (2020). *FAQ - Covid-19, questions and answers*. Retrieved June 15, 2020 from <http://www.salute.gov.it/portale/malattieInfettive/dettaglioFaqMalattieInfettive.jsp?lingua=italiano&id=230>



21. Jahrami, H., BaHammam, A. S., AlGahtani, H., Ebrahim, A., Faris, M., AlEid, K., Saif, Z., Haji, E., Dhahi, A., Marzooq, H., Hubail, S., & Hasan, Z. (2021). The examination of sleep quality for frontline healthcare workers during the outbreak of COVID-19. *Sleep and Breathing*, 25(1), 503-511. <https://doi.org/10.1007/s11325-020-02135-9>
22. Kancherla, B. S., Upender, R., Collen, J. F., Rishi, M. A., Sullivan, S. S., Ahmed, O., Berneking, M., Flynn-Evans, E. E., Peters, B. R., Abbasi-Feinberg, F., Aurora, R. N., Carden, K. A., Kirsch, D. B., Kristo, D. A., Malhotra, R. K., Martin, J. L., Olson, E. J., Ramar, K., Rosen, C. L., Rowley, J. A., Shelgikar, A. V., & Gurubhagavatula, I. (2020). Sleep, fatigue and burnout among physicians: An American Academy of Sleep Medicine position statement. *Journal of Clinical Sleep Medicine*, 16(5), 803-805. <https://doi.org/10.5664/jcsm.8408>
23. Kannampallil, T. G., Goss, C. W., Evanoff, B. A., Strickland, J. R., McAlister, R. P., & Duncan, J. (2020). Exposure to COVID-19 patients increases physician trainee stress and burnout. *PLoS One*, 15, e0237301. <https://doi.org/10.1371/journal.pone.0237301>
24. Koh, D. (2020). Occupational risks for COVID-19 infection. *Occupational Medicine*, 70(1), 3-5. <https://doi.org/10.1093/occmed/kqaa036>
25. Labrague, L. J., & de Los Santos, J. A. A. (2021). Fear of Covid-19, psychological distress, work satisfaction and turnover intention among frontline nurses. *Journal of Nursing Management*, 29(3), 395-403. <https://doi.org/10.1111/jonm.13168>
26. Leiter, M. P., & Maslach, C. (2016). Latent burnout profiles: A new approach to understanding the burnout experience. *Burnout Research*, 3(4), 89-100. <https://doi.org/10.1016/j.burn.2016.09.001>
27. Marchand, A., Blanc, M. E., & Beaugregard, N. (2018). Do age and gender contribute to workers' burnout symptoms? *Occupational Medicine*, 68(6), 405-411. <https://doi.org/10.1093/occmed/kqy088>
28. Martire, V. L., Caruso, D., Palagini, L., Zoccoli, G., & Bastianini, S. (2019). Stress 422 & sleep: A relationship lasting a lifetime. *Neuroscience & Biobehavioral Reviews*, 117, 65-77. <https://doi.org/10.1016/j.neubiorev.2019.08.024>
29. Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology*, 52, 397-422.
30. Maunder, R. G., Lancee, W. J., Balderson, K. E., Bennett, J. P., Borgundvaag, B., Evans, S., Fernandes, C. M., Goldbloom, D. S., Gupta, M., Hunter, J. J., McGillis Hall, L., Nagle, L. M., Pain, C., Peczeniuk, S. S., Raymond, G., Read, N., Rourke, S. B., Steinberg, R. J., Stewart, T. E., VanDeVelde-Coke, S., Veldhorst, G. G., & Wasylenki, D. A. (2006). Long-term psychological and occupational effects of providing hospital healthcare during SARS outbreak. *Emerging Infectious Diseases*, 12(12), 1924-1932. <https://doi.org/10.3201/eid1212.060584>

31. Mcmillan, K., Butow, P., Turner, J., Yates, P., White, K., Lambert, S., Stephens, M., & Laws, C. (2016). Burnout and the provision of psychosocial care amongst Australian cancer nurses. *European Journal of Oncology Nursing*, 22, 37-45. <https://doi.org/10.1016/j.ejon.2016.02.007>
32. Ménard, A. D., Soucie, K., Freeman, L., & Ralph, J. L. (2022). “My problems aren't severe enough to seek help”: Stress levels and use of mental health supports by Canadian hospital employees during the COVID-19 pandemic. *Health Policy*, 126, 106-111. <https://doi.org/10.1016/j.healthpol.2022.01.002>
33. Mo, Y., Deng, L., Zhang, L., Lang, Q., Liao, C., Wang, N., Qin, M., & Huang, H. (2020). Work stress among Chinese nurses to support Wuhan in fighting against COVID-19 epidemic. *Journal of Nursing Management*, 28(5), 1002-1009. <https://doi.org/10.1111/jonm.13014>
34. Morgantini, L. A., Naha, U., Wang, H., Francavilla, S., Acar, O., Flores, J. M., Crivellaro, S., Moreira, D., Abern, M., Eklund, M., Vigneswaran, H. T., & Weineet, S. M. (2020). Factors contributing to healthcare professional burnout during the COVID-19 pandemic: A rapid turnaround global survey. *MedRxiv: The Preprint Server for Health Sciences* [Preprint]. Available at <https://doi.org/10.1101/2020.05.17.20101915> (Accessed July, 25, 2020).
35. Moroianu, L.A., Moroianu, M., Toma, A., Barbu, R., Ardeleanu, V., Nitoi, L.C. (2021). Psychopathology in patients diagnosed with SARS COV 2: A brief report. *Mediterranean Journal of Clinical Psychology*, 9(1). <https://doi.org/10.6092/2282-1619/mjcp-2982>
36. Mota, I. A., Oliveira Sobrinho, G. D. D., Morais, I. P. S., & Dantas, T. F. (449 2021). Impact of COVID-19 on eating habits, physical activity and sleep in Brazilian healthcare professionals. *Arquivos de Neuro-Psiquiatria*, 79, 429-436. <https://doi.org/10.1590/0004-282X-ANP-2020-0482>
37. Peterson, S. A., Wolkow, A. P., Lockley, S. W., O'Brien, C. S., Qadri, S., Sullivan, J. P., Czeisler, C. A., Rajaratnam, S., & Barger, L. K. (2019). Associations between shift work characteristics, shift work schedules, sleep and burnout in North American police officers: A cross-sectional study. *BMJ Open*, 9(11), e030302. <https://doi.org/10.1136/bmjopen-2019-030302>
38. Reith, T. P. (2018). Burnout in United States healthcare professionals: A narrative review. *Cureus*, 10(12), e3681. <https://doi.org/10.7759/cureus.3681>
39. Remuzzi, A., & Remuzzi, G. (2020). COVID-19 and Italy: What next? *The Lancet*, 395(10231), 1225-1228. [https://doi.org/10.1016/S0140-6736\(20\)30627-9](https://doi.org/10.1016/S0140-6736(20)30627-9)
40. Schimmenti, A., Starcevic, V., Giardino, A., Khazaal Y., & Billieux, J. (2020). Multidimensional Assessment of COVID-19-Related Fears (MAC-RF): A theory-based instrument for the assessment of clinically relevant fears during pandemics. *Frontiers in Psychiatry*, 11. <https://doi.org/10.3389/fpsy.2020.00748>
41. Semple, S., & Cherrie, J. W. (2020). COVID-19: Protecting worker health. *Annals of Work Exposures and Health*, 64(5), 461-464. <https://doi.org/10.1093/annweh/wxaa033>

42. Shanafelt, T. D., Boone, S., Tan, L., Dyrbye, L. N., Sotile, W., Satele, D., Colin, P. W., Sloan, J., & Oreskovich, M. R. (2012). Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Archives of Internal Medicine*, *172*(18), 1377-1388.  
<https://doi.org/10.1001/archinternmed.2012.3199>
43. Sirigatti, S., & Stefanile, C. (1988). Per una scala di misurazione del burnout. *Bollettino di Psicologia Applicata*, *187*, 29-32.
44. Veronese, G., Cavazzoni, F., Fiore, F., Pancake, R. (2021). Fear of COVID-19 mediates the relation between mental distress and at-risk health behaviours in Italian adults. *Mediterranean Journal of Clinical Psychology*, *9*(3). <https://doi.org/10.13129/2282-1619/mjcp-3145>
45. Wei, R., Ji, H., Li, J., & Zhang, L. (2017). Active intervention can decrease burnout in ED nurses. *Journal of Emergency Nursing*, *43*(2), 145-149. <https://doi.org/10.1016/j.jen.2016.07.011>
46. West, C. P., Dyrbye, L. N., Erwin, P. J., & Shanafelt, T. D. (2016). Interventions 476 to prevent and reduce physician burnout: A systematic review and meta-analysis. *The Lancet*, *388*(10057), 2272-2281. [https://doi.org/10.1016/S0140-6736\(16\)31279-X](https://doi.org/10.1016/S0140-6736(16)31279-X)
47. World Health Organization (WHO) (2020, 11 March). *WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020 [Press release]*. Retrieved July 25, 2020 from <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media482briefing-on-covid-19---11-march-2020>
48. World Health Organization (WHO) (2020b, 17 April). *Q&A on coronaviruses (COVID-19)*. Retrieved July 25, 2020 from <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-andanswers-hub/q-a-detail/q-a-coronaviruses>
49. World Health Organization (WHO) (2022a, 22 March). *COVID-19 Weekly Epidemiological Update*. Retrieved March 26, 2022 from: <https://www.who.int/publications/m/item/weekly-epidemiological-update-oncovid-19---22-march-2022>
50. World Health Organization (WHO) (2022b, 26 March). *WHO Coronavirus (COVID-19) Dashboard*. Retrieved March 26, 2022 from <https://covid19.who.int/region/euro/country/it>
51. Wu, P., Fang, Y., Guan, Z., Fan, B., Kong, J., Yao, Z., Liu, X., Fuller, C. J., Susser, E., Lu, J., & Hoven, C. W. (2009). The psychological impact of the SARS epidemic on hospital employees in China: Exposure, risk perception, and altruistic acceptance of risk. *The Canadian Journal of Psychiatry*, *54*(5), 302-311. <https://doi.org/10.1177/070674370905400504>



©2022 by the Author(s); licensee Mediterranean Journal of Clinical Psychology, Messina, Italy. This article is an open access article, licensed under a Creative Commons Attribution 4.0 Unported License. Mediterranean Journal of Clinical Psychology, Vol. 10, No. 1 (2022).

International License (<https://creativecommons.org/licenses/by/4.0/>).

**DOI:** 10.13129/2282-1619/mjcp-3292