

Original Article

Prevalence of burnout syndrome among newly hired healthcare workers before and during the COVID-19 pandemic in Italy: A comparative cross-sectional study

Prevalenza della sindrome del burnout negli operatori sanitari in Italia prima e durante la pandemia da COVID-19 in Italia: uno studio trasversale di confronto

Ivana CACCIATORI¹, Ciro D'AURIA^{2*}, Asia BRUNERI³, Silvia ROZZA⁴

¹Simple Departmental Operational Unit of Clinical Psychology, Ospedale Maggiore di Lodi, Lodi, Italia. E-mail: ivana.cacciatori@asst-lodi.it

² Simple Departmental Operational Unit of Clinical Psychology, Ospedale Maggiore di Lodi, Lodi, Italia. E-mail: ci.d'auria.93@hotmail.com

³ Simple Departmental Operational Unit of Clinical Psychology, Ospedale Maggiore di Lodi, Lodi, Italia. E-mail: asia.bruneri@libero.it

⁴ Simple Departmental Operational Unit of Clinical Psychology, Ospedale Maggiore di Lodi, Lodi, Italia. E-mail: silvia.rozza91@gmail.com

* Author for the correspondence

Abstract

Introduction: Aim of this study is to analyze the impact of COVID-19 pandemic on burnout levels of newly hired healthcare workers (HCWs) employed in Italy during the COVID-19 emergency.

Methods: A comparative cross-sectional study was conducted on two different convenience samples of newly hired HCWs employed with different positions (physicians, nurses, other categories) at a public hospital in Lodi, Lombardy. Data was collected before the COVID-19 pandemic and after the onset of the pandemic (from February to October 2020). Burnout levels were measured with the Maslach Burnout Inventory-Human Services Survey (MBI-HSS). Burnout syndrome was considered as the sum of high Emotional Exhaustion (EE) and Depersonalization (DP) and low Personal Accomplishment (PA). Chi square and ANOVA test were carried out for comparisons. P value was set at 0.05.

Results: Prevalence of BOS in newly hired HCWs was higher in the "COVID-19" group than in the "before COVID-19" group (n = 34, 30.3% vs n = 3, 2.5%). Differences in BOS frequency and all single sub-dimensions (high EE, high DP, low PA) of BOS between two groups were statistically significant.

Discussion: Newly hired HCWs employed during the COVID-19 emergency in Italy are at high risk of BOS, confirming the risk of mental distress, BOS alongside other mental disorders already described in the literature, in frontline HCWs employed during this emergency. Occupational health surveillance and workplace health promotions with teams of psychologists may promote higher levels of mental well-being in frontline newly hired HCWs during the COVID-19 emergency.

Riassunto

Introduzione: L'obiettivo di questo studio è di analizzare l'impatto della pandemia da COVID-19 sui livelli di burnout sugli operatori sanitari (OS) neoassunti occupati in Italia durante l'emergenza COVID-19.

Metodi: È stato condotto uno studio trasversale di confronto su due diversi campioni di OS neoassunti occupati in diverse posizioni (medici, infermieri, altre categorie) nell'ospedale pubblico di Lodi, in Lombardia. I dati sono stati raccolti prima della pandemia da COVID-19 e dopo l'esordio della pandemia (da febbraio ad ottobre 2020). I livelli di burnout sono stati misurati con il Maslach Burnout Inventory-Human Services Survey (MBI-HSS). La sindrome da burnout è stata considerata come la somma dell'alto Esaurimento Emotivo (EE) e della Depersonalizzazione (DP) e della bassa Realizzazione Personale (RP). Per i confronti, sono stati eseguiti i test del Chi-quadrato e dell'ANOVA. Il valore di significatività statistica "p" è stato impostato a 0.05.

Risultati: La prevalenza della sindrome da burnout negli OS neoassunti è stata più alta nel gruppo "COVID-19" rispetto al gruppo "prima del COVID-19" (n = 34, 30.3% vs n = 3, 2.5%). Le differenze nella frequenza del burnout e in tutte le singole sottodimensioni (alto EE, alta DP, bassa RP) della sindrome tra i due gruppi sono risultate statisticamente significative.

Discussione: Gli OS neoassunti occupati durante l'emergenza COVID-19 in Italia sono ad alto rischio di burnout, confermando il rischio di burnout, insieme ad altri disturbi mentali già descritti in letteratura, negli OS neoassunti occupati in prima linea durante questa emergenza. La sorveglianza sanitaria e le attività di promozione della salute sul posto di lavoro con team di psicologi potrebbero promuovere livelli più alti di benessere mentale negli OS neoassunti in prima linea durante l'emergenza COVID-19.

Parole chiave: COVID-19; sindrome da burnout; operatori sanitari; neoassunti; psicologia della salute occupazionale; SARS-CoV-2. **Key words:** COVID-19; burnout syndrome; healthcare workers; newly hired; occupational health psychology; SARS-CoV-2.

Cite this paper as: Cacciatori I, D'Auria C, Bruneri A, Rozza S. Prevalence of burnout syndrome among newly hired healthcare workers in Italy before and during the COVID-19 pandemic in Italy: A comparative cross-sectional study [Prevalenza della syndrome del burnout tra gli operatori sanitari neoassunti prima e durante la pandemia da COVID-19 in Italia: uno studio trasversale di confronto]. G Ital Psicol Med Lav. 2021;1(2):225-237.

Received: 10 September 2021; Accepted: 15 December 2021; Published: 15 December 2021

INTRODUCTION

Since December 2019, when the first cases of human infections from the new coronavirus (SARS-CoV-2) appeared [1], the emergent new disease termed as Coronavirus Disease 19 (COVID-19) rapidly spread all over the world [2]. In March 2020, the COVID-19 infection has been declared pandemic, due to the invasive epidemic spreading uncontrollably [2], which caused an unprecedented public health emergency in modern history. This pandemic has caused severe psychological disorders in some categories of the population like children, adolescents and older, as well as in infected people and some categories of workers like healthcare workers (HCWs). Many reviews showed high levels of anxiety, depression, stress, fear, sleep disorders, frustration, post-traumatic stress disorders (PTSD) and burnout syndrome (BOS), especially in front-line healthcare workers [3–6].

COVID-19 infection has been recognized in Italy as an occupational injury in HCWs and other front-line workers [7]. Indeed, HCWs are constantly exposed to long shift working, high demands of

care and workloads, as well as severe emotional burden [8–10]. At the beginning of the pandemic, in Italy and other countries, hospitals faced shortages of personal protective equipments (PPEs), and lack of established procedures and guidance [7, 11, 12]. Therefore, many HCWs felt confused and unprepared to treat properly patients infected with the new virus [13]. This situation of uncertainty, characterized by lack of support, alienation, fear of contagion, guilty, isolation and difficulty in managing the “unknown”, in combination with high workload, made health professionals more vulnerable and prone to loneliness and perceived stigma. This resulted in severe psychological and emotional consequences among HCWs, such as anxiety, depression, sleep disorders, post-traumatic stress disorders (PTSD) [14, 15] and burnout [6, 16].

Burnout syndrome is a state of physical, emotional and mental exhaustion, due to the exposure to stressful factors and emotionally demanding situations [17–19], which was explained by Maslach [20] in helping professions, as a reaction to the emotional distress determined by the constant and direct contact with other human beings, especially if they are suffering. BOS may have many adverse effects on workers, such as low job satisfaction and depression, as well as poor outcomes for the organizations, such as high turnover, sick leave, high injuries and accidents rates, low productivity, interpersonal conflicts, and has been associated with other psychosocial risk factors at work including workplace violence [21].

In general, HCWs are at high-risk of developing BOS due to emotional contact with their patients, aggressions by clients, long and solitary shifts and highly stressing work environments [22]. Nurses and physicians are at higher risk [23–26] compared to the rest of the hospital staff, due to their working conditions, highly challenging demands and responsibility that are entrusted to these professions [27]. Some studies showed intensive care units and emergency departments as highly stressful workplaces that may promote the onset of BOS [28–30].

As a consequence of BOS, HCWs may develop symptoms such as anxiety, irritability, moodiness, insomnia, depression, PTSD, suicidal thoughts and feelings of failure [31–33]. BOS consequences can include psychosomatic disorders, such as headache, high blood pressure, cardiopulmonary diseases, musculoskeletal and gastric disorders, stomach ulcers, insomnia and fatigue [18, 34]. Finally, BOS may lead to low performance at work, intention to leave, and poor care for the patient. BOS among physicians and nurses is much prevalent in both high-income [23–26, 35] and middle and low-income countries [36].

During pandemic or other critical situations, protective factors can help HCWs to face the emergency. The most functional coping strategies are clear guidelines, supervisor’s support, proper training, precautionary measures, social, familiar, spiritual, and religious support [37–41]. It was found that even personality traits may affect how HCWs cope with stressors [42]. BOS has been studied in young HCWs [43,44], and most studies on BOS have been conducted during the COVID-19 emergency, showing a positive association between COVID-19 related stress, the onset of BOS [45–47] and the protective role of resilience and organizational interventions, which may mitigate harmful BOS-related psychological effects [48, 49]. During the previous SARS emergency, optimism, resilience and altruism reduced psychological distress among HCWs [50, 51]. A previous study [49] from an Italian hospital, in Lombardy, which was the most hit Italian region during the first wave of COVID-19 in Italy [52], showed that resilience is a protective factor against burnout in HCWs, especially in new hires.

With these premises, the present study aimed to study the role of the COVID-19 pandemic in newly hires HCWs, by comparing their BOS levels before and during the first wave of the COVID-19 pandemic in Italy.

METHODS

Study design and setting

This comparative, cross-sectional, study was carried out in a local hospital of Lodi, a city near to Milano, Lombardy, Italy. Data was collected from April 2019 (before the onset of the pandemic) to October 2020 (during the first COVID-19 wave and the subsequent generalized lockdown in Italy).

Study participants

All healthcare professionals (physicians, nurses, paramedics) newly recruited from our hospital were subject to a psychological evaluation for the fitness to job, according to the occupational health surveillance program developed by the Occupational Health and Clinical Psychology Units of the Lodi ASST local hospital. Participants were evaluated 30-40 days after starting their job. They constituted two groups, those employed and evaluated during the 2019 year, from January to December, and those employed and surveyed after the onset of the COVID-19 pandemic (from April 9th, 2020, to October 30th, 2020). In Italy, the first wave occurred during February-April 2020, while the second wave began in October 2020 [53].

The "before COVID-19" group comprised 85 HCWs, while 112 diverse HCWs constituted the "COVID-19" group. Participants of the first group were visited by psychological instruments that were administered during clinical interviews by trained psychologists. Participants of the second group were surveyed by psychologists through online interviews, in compliance with safety regulations on COVID-19.

Study instruments

Socio-demographic characteristics

A self-report questionnaire was administered to collect the main socio-demographic characteristics, including gender, age, type of work and work department.

Maslach Burnout Inventory

The Italian version of the Maslach Burnout Inventory-Human Services Survey (MBI HSS) [20, 54] was used for evaluating BOS levels. Formulated in accordance with the WHO and ICD-11 definitions of BOS, the original questionnaire includes three sub-dimensions consisting of 22 items: the 9-items emotional exhaustion (EE) (feelings of emotional overextension by one's work), the 5-items depersonalization (DP) (unfeeling and impersonal response towards patients), and the 8-items personal accomplishment (PA) (feelings of competence and successful achievement in one's work). The three sub-scales demonstrate strong sample-specific reliability based on the 84 published studies thus far, and further validated for human service occupations, including medical professionals [20, 55]. According to Maslach definition, BOS is characterized by high EE and DP and low PA [56, 57]. In this study, prevalence of BOS was measured as a sum of high EE, high DP, and low PA [58]. Sub-dimensions levels were classified as "low/medium/high" as follows: EE (≤ 14 ; 15-23; ≥ 24), DP (≤ 3 ; 4-9; ≥ 9), PA (≥ 37 ; 30-36; ≤ 29). Cronbach's alpha of the subscales at baseline for the "before COVID-19" group was $\alpha = .90$ for EE, $\alpha = .79$ for DP, and $\alpha = .71$ for PA, indicating acceptable to good internal consistency. Cronbach's alpha at baseline for the "COVID-19" group was $\alpha = .92$ for EE, $\alpha = .76$ for DP, and $\alpha = .72$ for PA, indicating acceptable to good internal consistency.

Data analysis

All data was analyzed using SPSS version 26 (IBM, 2017). Descriptive statistics were computed to report the demographics in the groups. Differences between before and after COVID-19 groups were evaluated with χ^2 test (for categorical variables) and ANOVA test (for continuous variables). Significant values were set up at $p < 0.05$.

Ethical aspects

This study was conducted in accordance with ethical principles of the Declaration of Helsinki and Good Clinical Practice guidelines. Our research received approval from the authorized institutional review board. All participants (or legally authorized representatives) provided informed consent.

RESULTS

Descriptive statistics

In the “before-19” group, the percentage of female participants was 70.6% (n = 60) and the mean age of all participants was 35 ± 8.9 years (range: 24-61 years). In the “COVID-19” group of HCWs, the percentage of female participants was similar (70.2%, n = 73), as well as the mean age of participants (34 ± 10.1 years, range: 22-61 years). The most represented categories were the nurses (n= 40; 47.1%) and the HCWs employed at the medical department (n= 20, 23.5%) in the “before COVID-19” group, as well as the nurses (n = 65, 58%) and HCWs employed at the medical department (n = 33, 29,5%) in the “COVID-19” group. Prevalence of BOS in new hires HCWs of the “COVID-19” group was higher than in new hires HCWs employed in the “before COVID-19” group (n = 34, 30.3% vs n = 3, 2.5%). Descriptive statistics of the participants and prevalence of BOS are presented in Table 1.

Table 1. Prevalence of BOS by type of work and department in the two groups (n = 197).

	“Before” COVID-19 group (n = 85)	COVID-19 group (n = 112)	“Before” COVID-19 group (n = 85)	COVID-19 group (n = 112)
	Frequency n; %	Frequency n; %	BOS prevalence	BOS prevalence
Type of work				
Physicians	28 (32.9%)	9 (7.1%)	2 (66.7%)	3 (8.8%)
Psychologist	5 (5.9%)	-	-	-
Physiotherapist	3 (3.5%)	2 (1.8%)	-	-
Podiatrist	1 (1.2%)	-	-	1 (2.9%)
Speech therapist	1 (1.2%)	-	-	-
Sociomedical operator	5 (5.9%)	32 (25%)	-	12 (35.3%)
Nurse	40 (47.1%)	68 (68%)	1 (33.3%)	18 (52.9%)
Midwife	2 (2.4%)	-	-	-
Rehabilitation technician	-	1 (0.9%)	-	-
Total	85	112	3	34
Type of department				
Surgical department	11 (12.9%)	22 (19.6%)	-	4 (11.8%)
Low intensity department	12 (14.1%)	16 (14.3%)	1 (33.3%)	6 (17.6%)

Radiology department	1 (1.2%)	8 (7.1%)	-	1 (2.9%)
Emergency department	17 (20%)	10 (8.9%)	1 (33.3%)	4 (11.8%)
Department of Maternal, newborn and child health	10 (11.8%)	4 (3.6%)	-	2 (5.9%)
Department of Medicine	20 (23.5%)	33 (39.5%)	1 (33.3%)	13 (38.2%)
Mental health department	6 (7.1%)	11 (9.8%)	-	2 (5.9%)
Department of Oncology	4 (4.7%)	3 (2.7%)	-	2 (5.9%)
Health department	1 (1.2%)	3 (2.7%)	-	-
Operating theatre medical	3 (3.5%)	2 (1.8%)	-	-
Total	85	112	3 (2.5%)	34* (30.3%)

Notes: * $p < 0.05$

Differences between “before” and “COVID-19” group

The chi square test revealed a significant difference in BOS levels, as well as in BOS sub-dimensions (high EE and DP and low PA) between the “before COVID-19 group” and the “COVID-19 group”, where the latter showed higher BOS percentages among HCWs. However, there were no significant differences in mean values of EE, DP and PA between two groups. The “before COVID” group (n = 85) scored 12.36 ± 6.77 on EE subscale (low level of emotional exhaustion), 7.39 ± 4.21 on DP sub-scale (medium level of depersonalization), and 33.69 ± 5.5 on PA (medium level of personal accomplishment). The 112 subjects from the “COVID-19” groups reported 7.89 ± 7.57 on EE sub-scale (low level of emotional exhaustion), 3.05 ± 3.74 on DP sub-scale (low level of depersonalization), and 36.05 ± 7.49 on PA subscale (medium level of personal accomplishment).

DISCUSSION

HCWs are susceptible to job burnout, with the highest levels of job burnout reported among HCWs working in the emergency and Intensive Care Unit environment where they are exposed to an overwhelming amount of job-related stress [59]. Hospitals are facing staffing shortages made worse by the COVID-19 pandemic. Indeed, many HCWs are burned out and are deciding to retire or quit. For this reason, hospitals are spending money to hire and retain healthcare workers during this emergency [60]. Combatting the shortages of HCWs could decrease work-related stress, especially in times of pandemic [61]. In this study, we carried out a cross-sectional, comparative analysis between two unpaired samples of newly hired HCWs, respectively before the onset of COVID-19 and during the first wave of COVID-19 infections in Italy, with the aim to understand the role of the emotional impact due to COVID-19 emergency on BOS levels among newly hired HCWs. In 2020, the city of Lodi, where severe lockdown measures were put in action, was the first “red zone” in Italy. For this reason, we expected higher levels of BOS during the COVID-19 pandemic in HCWs working in this territory. Our findings confirmed this hypothesis, showing a higher prevalence of HCWs affected by BOS during the COVID-19 pandemic, as well as significant differences in BOS levels and single sub-dimensions of BOS (high EE, high DP and low PA), which were higher in the “COVID-19” group in comparison with the “before COVID-19” group. On the contrary, the mean scores of all BOS subdimensions showed similar scores in both samples (low levels of EE and DP and medium

levels of PA), showing no statistically difference between the two groups. Our findings seem to confirm the presence of a higher risk, during the COVID-19 pandemic, that frontline HCWs are facing, as they are exposed to many stressful working conditions, such as increased workload and reduced resting schedule, which predispose them to high levels of emotional stress [62, 63]. As shown by some systematic reviews, BOS is inevitable among frontline HCWs, especially nurses who are closer to patients than doctors because they work on the ward where patients are managed, and they relate directly with caregivers or family members of patients [5, 6]. In the systematic review by Danet & Danet [64], all HCWs reported high (32%) and medium (36%) levels of emotional exhaustion and depersonalization, with higher burnout levels among frontline personnel who were younger and with greater workload.

With regard to age, previous research found a significant negative correlation between age and both emotional exhaustion and depersonalization as measured by the Maslach Burnout Inventory [65], even though evidence from the literature on this topic is inconsistent, suggesting a lack of association between age and burnout [66–70].

Our findings are in agreement with work by Mazzella, Ebstein and colleagues [71] showing low levels of BOS in newly hired HCWs. In another study before the pandemic (2018) carried out in China on 171 newly hired nurses from 58 hospitals, nurses' emotional exhaustion was positively related so surface acting, whereas deep acting was negatively related to emotional exhaustion [72]. However, to the best of our knowledge this is one of the first studies examining the impact of BOS among newly hired HCWs employed in hospital during the COVID-19 pandemic.

Our study is not without limitations. The small convenience sample and the cross-sectional nature of our study limit to infer on the causal relationship between BOS and being newly hired in hospital in the context of the pandemic, as there are many potential factors that may confound this association. Furthermore, this study has been carried out in the context of an occupational health program, which is needed for protecting the physical and mental health of HCWs and requested according to Italia health and safety programs [73].

Our study, therefore, suggests the importance of occupational health programs for protecting the mental health of HCWs, preventing them from the onset of BOS and other psychological disorders [74]. This is important to provide higher quality of care to the patients, especially in times of pandemic. Furthermore, workplace promotion activities based on meditation, spiritual resources, training to cope with high stressful events may promote higher resilience levels in this category of workers and prevent the onset of BOS and other mental disorders. Workers with more intrinsic and extrinsic motivations showed lower levels of job burnout. Employee motivation is shown through energy directed towards work attitudes to achieve the goal of organization. The sense of responsibility and high self-esteem may increase the resilience and prevent from the onset of BOS [75].

According to the literature [75–78] resilience may play a protective role, but several factors, such as coping strategies, personality, personal motivation, work engagement levels, spiritual and emotional resources could contribute to this result and should be investigated in future studies [79–81].

Author Contributions: Conceptualization, I.C.; methodology, C.D.; formal analysis, C.D.; investigation, I.C, A.B.; writing—original draft preparation, C.D; writing—review and editing, S.R. All authors have read and agreed to the published version of the manuscript.

Funding: None

Acknowledgments: None.

Conflicts of Interest: None

References

1. Jin YH, Cai L, Cheng ZS, et al. A rapid advice guideline for the diagnosis and treatment of 2019 novel coronavirus (2019-nCoV) infected pneumonia (standard version). *Mil Med Res*. 2020;7(1):4. <https://doi.org/10.1186/s40779-020-0233-6>.
2. World Health Organization. Coronavirus Disease 2019 (COVID-19) Situation Report – 116 (2020). <https://www.who.int/docs/defaultsource/coronaviruse/situation-reports/20200515-covid-19-sitrep-116.pdf> and <https://www.who.int/emergencies/diseases/novel-coronavirus-2019> (accessed 10/12/2021).
3. Pappa S, Ntella V, Giannakas T, et al. Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis. *Brain Behav Immun*. 2020 Aug;88:901–907. doi: 10.1016/j.bbi.2020.05.026. Epub 2020 May 8. Erratum in: *Brain Behav Immun*. 2021 Feb;92:247.
4. Luo M, Guo L, Yu M, et al. The psychological and mental impact of coronavirus disease 2019 (COVID-19) on medical staff and general public - A systematic review and meta-analysis. *Psychiatry Res*. 2020 Sep;291:113190. doi: 10.1016/j.psychres.2020.113190. Epub 2020 Jun 7.
5. Chirico F, Ferrari G, Nucera G, et al. Prevalence of anxiety, depression, burnout syndrome, and mental health disorders among healthcare workers during the COVID-19 pandemic: A rapid umbrella review of systematic reviews. *J Health Soc Sci*. 2021;6(2):209–220. doi: 10.19204/2021/prv17.
6. Magnavita N, Chirico F, Garbarino S, et al. SARS/MERS/SARS-CoV-2 Outbreaks and Burnout Syndrome among Healthcare Workers. An umbrella Systematic Review. *Int J Environ Res Public Health*. 2021;18(8):4361. doi: 10.3390/ijerph18084361.
7. Chirico F, Magnavita N. Covid-19 infection in Italy: An occupational injury. *S Afr Med J*. 2020 May 8;110(6):12944. doi: 10.7196/SAMJ.2020.v110i6.14855.
8. Chirico F, Nucera G. Tribute to healthcare operators threatened by COVID-19 pandemic. *J Health Soc Sci*. 2020;5(2):165–168. Doi: 10.19204/2020/trbt1.
9. Huang JZ, Han MF, Luo TD, et al. Mental health survey of 230 medical staff in a tertiary infectious disease hospital for COVID-19. *Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi*. 2020;38:192–195. <https://doi.org/10.3760/cma.j.cn121094-20200219-00063>.
10. Ornell F, Schuch JB, Sordi AO, et al. “Pandemic fear” and COVID-19: mental health burden and strategies. *Braz J Psychiat*. 2020;42:232–235. <https://doi.org/10.1590/1516-4446-2020-0008>.
11. Chirico F, Nucera G, Sacco A, et al. Proper respirators use is crucial for protecting both emergency first aid responder and casualty from COVID-19 and airborne-transmitted infections. *Adv Respir Med*. 2021;89(1):99–100. doi: 10.5603/ARM.a2021.0028
12. Xiang YT, Yang Y, Li W, et al. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *Lancet*. 2020;7(3):228–229. [https://doi.org/10.1016/S2215-0366\(20\)30046-8](https://doi.org/10.1016/S2215-0366(20)30046-8).
13. Huang H, Hur W-M, Shin Y. Emotional exhaustion among the South Korean workforce before and after COVID-19. *Psychol Psychother*. 2020. <https://doi.org/10.1111/papt.12309>.

14. Ran L, Chen X, Wang Y, et al. Risk Factors of Healthcare Workers with Corona Virus Disease 2019: A Retrospective Cohort Study in a Designated Hospital of Wuhan in China. *Clin Infect Dis*. 2020;71(16):2218–2221. <https://doi.org/10.1093/cid/ciaa287>.
15. Zhang C, Yang L, Liu S, et al. Survey of Insomnia and Related Social Psychological Factors Among Medical Staff Involved in the 2019 Novel Coronavirus Disease Outbreak. *Front Psychiatry*. 2020;11:306. <https://doi.org/10.3389/fpsy.2020.00306>.
16. Galanis P, Vraka I, Fragkou D, et al. Nurses' burnout and associated risk factors during the COVID-19 pandemic: A systematic review and meta-analysis. *J Adv Nurs*. 2021 Aug;77(8):3286–3302. doi: 10.1111/jan.14839. Epub 2021 Mar 25.
17. Maslach C, Leiter MP. Early predictors of job burnout and engagement. *J Appl Psychol*. 2008;93:498–512. <https://doi.org/10.5271/sjweh.948>.
18. Maslach C. What have we learned about burnout and health? *Psychol Health*. 2001;16(5):607–611. <https://doi.org/10.1080/08870440108405530>.
19. Chirico F, Magnavita N. Burnout Syndrome and Meta-Analyses: Need for Evidence-Based Research in Occupational Health. Comments on Prevalence of Burnout in Medical and Surgical Residents: A Meta-Analysis. *Int J Environ. Res Public Health*. 2019, 16, doi:10.3390/ijerph16091479. *Int J Environ Res Public Health*. 2020;17(3):741. Published 2020 Jan 23. doi:10.3390/ijerph17030741.
20. Maslach C. Understanding burnout: definitional issues in analyzing a complex phenomenon. In *Job Stress and Burnout: Research, Theory and Intervention Perspectives*. Paine W.S., ed. Beverly Hills. Sage Focus Editions; 1982.
21. West CP, Dyrbye LN, Erwin PJ, et al. Interventions to prevent and reduce physician burnout: a systematic review and meta-analysis. *Lancet*. 2016 Nov 5;388(10057):2272–2281. doi: 10.1016/S0140-6736(16)31279-X. Epub 2016 Sep 28.
22. Kristensen TS, Hannerz H, Høgh A, et al. The Copenhagen Psychosocial Questionnaire: a tool for the assessment and improvement of the psychosocial work environment. *Scand J Work Environ Health*. 2005;31:438–449. <https://doi.org/10.5271/sjweh.948>.
23. Aiken LH, Sermeus W, Van den Heede K, et al. Patient safety, satisfaction, and quality of hospital care: cross sectional surveys of nurses and patients in 12 countries in Europe and the United States. *BMJ*. 2012;344(2):1717. doi: 10.1136/bmj.e1717.
24. Arigoni F, Bovier PA, Mermillod B, et al. Prevalence of burnout among Swiss cancer clinicians, paediatricians and general practitioners: who are most at risk? *Support Care Cancer*. 2009;17(1):75–81. <https://doi.org/10.1007/s00520-008-0465-6>.
25. Bakker AB, Killmer CH, Siegrist J, et al. Effort–reward imbalance and burnout among nurses. *J Adv Nurs*. 2000;31(4):884–891. <https://doi.org/10.1046/j.1365-2648.2000.01361.x>.
26. Goehring C, Gallacchi MB, Künzi B, et al. Psychosocial and professional characteristics of burnout in Swiss primary care practitioners: a cross-sectional survey. *Swiss Med Wkly*. 2005;135(7-8):101–108.
27. Hämmig O, Brauchli R, Bauer GF. Effort-reward and work-life imbalance, general stress and burnout among employees of a large public hospital in Switzerland. *Swiss Med Wkly*. 2012;142:w13577.
28. Epp K. Burnout in critical care nurses: A literature review. *Dynamics*. 2012;23(4):25–31.
29. Moss M, Good VS, Gozal D, et al. A critical care societies collaborative statement: Burnout syndrome in critical care health-care professionals. *Am J Resp Crit Care*. 2016;194(1):106–113. <https://doi.org/10.1097/CCM.0000000000001885>.

30. Zhang X, Klassen RM, Wang Y. Academic burnout and motivation of Chinese secondary students. *Int J Human Soc Sci.* 2013;3:134–138. <https://doi.org/10.7763/IJSSH.2013.V3.212>.
31. McVicar A. Workplace stress in nursing: a literature review. *Journal of Advanced Nursing.* 2003;44(6):633–642. <https://doi.org/10.1046/j.0309-2402.2003.02853.x>.
32. Reinhard SC, Feinberg LF, Choula R, et al. Valuing the Invaluable: 2015 Update: Undeniable Progress, but Big Gaps Remain [Internet]. AARP Public Policy Institute. 2015. Washington DC. <http://www.aarp.org/content/dam/aarp/ppi/2015/valuing-the-invaluable-2015-update-new.pdf> (accessed 10/09/2021).
33. Shanafelt TD, Hasan O, Dyrbye LN, et al. Changes in Burnout and Satisfaction With Work-Life Balance in Physicians and the General US Working Population Between 2011 and 2014. *Mayo Clin Proc.* 2015;90(12):1600–1613. <https://doi.org/10.1016/j.mayocp.2015.08.023>.
34. Mauranges A. Symptômes et caractéristiques du burn out [Symptoms and characteristics of burnout]. *Soins.* 2018 Nov;63(830):28–32. French. doi: 10.1016/j.soins.2018.09.006.
35. Bennett S, Plint A, Clifford TJ. Burnout, psychological morbidity, job satisfaction, and stress: a survey of Canadian hospital-based child protection professionals. *Arch Dis Child.* 2005;90(11):1112–1116. <https://doi.org/10.1136/adc.2003.048462>.
36. Elbarazi I, Loney T, Yousef S, et al. Prevalence of and factors associated with burnout among healthcare professionals in Arab countries: A systematic review. *BMC Health Serv Res.* 2017;17:1–10. <https://doi.org/10.1186/s12913-017-2319-8>.
37. Chan AOM, Huak CY. Psychological impact of the 2003 severe acute respiratory syndrome outbreak on health care workers in a medium size regional general hospital in Singapore. *Occup Med.* 2004;54:190–196. <https://doi.org/10.1093/occmed/kqh027>.
38. Cheng SKW, Wong CW. Psychological intervention with sufferers from severe acute respiratory syndrome (SARS): lessons learnt from empirical findings. *Clin Psychol Psychiat.* 2005;12: 80–86. <https://doi.org/10.1002/cpp.429>.
39. Maunder RG, Lancee WJ, Balderson KE, et al. Long-term psychological and occupational effects of providing hospital healthcare during SARS outbreak. *Emerg Infect Dis.* 2006;12:1924–1932. <https://doi.org/10.3201/eid1212.060584>.
40. Chirico F, Sharma M, Zaffina S, et al. Spirituality and Prayer on Teacher Stress and Burnout in an Italian Cohort: A Pilot, Before-After Controlled Study. *Front Psychol.* 2020;10:2933. Published 2020 Jan 21. doi:10.3389/fpsyg.2019.02933.
41. Chirico F. Religious Belief and Mental Health in Lay and Consecrated Italian Teachers. *J Relig Health.* 2017 Jun;56(3):839–851. doi: 10.1007/s10943-016-0242-7.
42. Santosh KR, James J. The effect of resilience on burnout among the blue collared employees in metal factories. *Int Muldiscip Res.* 2013;3:48–55.
43. Chen J, Li J, Cao B, et al. Mediating effects of self-efficacy, coping, burnout, and social support between job stress and mental health among young Chinese nurses. *J Adv Nurs.* 2020 Jan;76(1):163–173. doi: 10.1111/jan.14208. Epub 2019 Oct 13.
44. Kim JH, Kim AR, Kim MG, et al. Burnout Syndrome and Work-Related Stress in Physical and Occupational Therapists Working in Different Types of Hospitals: Which Group Is the Most Vulnerable? *Int J Environ Res Public Health.* 2020 Jul 11;17(14):5001. doi: 10.3390/ijerph17145001.

45. Bradley M, Chahar P. Burnout of healthcare providers during COVID-19. *Clev Clin J Med*. 2020; 1–3. <https://doi.org/10.3949/ccjm.87a.ccc051>.
46. Morgantini LA, Naha U, Wang H, et al. Factors contributing to healthcare professional burnout during the COVID-19 pandemic: A Rapid Turnaround Global Survey. *MedRxiv*. 2020;1–17. <https://doi.org/10.1101/2020.05.17.20101915>.
47. Sung CW, Chen CH, Fan CY, et al. Burnout in medical staffs during a coronavirus disease (COVID-19) pandemic. *SSRN Electronic Journal*. 2020. <https://doi.org/10.2139/ssrn.3594567>.
48. Hao S, Hong W, Xu H, et al. Relationship between resilience, stress and burnout among civil servants in Beijing, China: Mediating and moderating effect analysis. *Pers Individ Differ*. 2015;83:65–71. <https://doi.org/10.1016/j.paid.2015.03.048>.
49. Cacciatori I, Grossi C, D'Auria C, et al. La capacità di resilienza come un fattore di protezione per il burnout tra gli operatori sanitari: uno studio cross-sectional condotto sui neo-assunti dell'ASST di Lodi [Resilience skills as a protective factor against burnout for health professionals: a cross-sectional study on new hires from the hospital of Lodi]. *G Ital Med Lav Ergon*. 2021 Jun;43(2):131–136.
50. Bai Y, Lin CC, Lin CY, et al. Survey of stress reactions among health care workers involved with the SARS outbreak. *Psychiat Serv*. 2004;55(9):1055–1057. <https://doi.org/10.1176/appi.ps.55.9.1055>.
51. Lee AM, Wong JG, McAlonan GM, et al. Stress and psychological distress among SARS survivors 1 year after the outbreak. *Can J Psychiatry*. 2007 Apr;52(4):233–240. doi: 10.1177/070674370705200405.
52. Chirico F, Nucera G, Szarpak L. COVID-19 mortality in Italy: The first wave was more severe and deadly, but only in Lombardy region. *J Infect*. 2021. doi:10-1016/j.jinf.2021.05.006.
53. Chirico F, Sacco A, Nucera G, et al. Lockdown measures and COVID-19 related deaths during the first and second COVID-19 waves in Italy: A descriptive study. *J Health Soc Sci*. 2021;6(3):379–390. doi: 10.19204/2021/lckd1.
54. Sirigatti S, Stefanile C, Menoni E, et al. Caratteristiche Metrologiche Di Una Scala Di Misurazione Del Burnout. *BPA*. 1988;187-188:71–81. <http://hdl.handle.net/2158/335285>
55. Raudenská J, Steinerová V, Javůrková A, et al. Occupational burnout syndrome and post-traumatic stress among healthcare professionals during the novel coronavirus disease 2019 (COVID-19) pandemic. *Best Pract Res Clin Anaesthesiol*. 2020;34(3):553–560. doi: 10.1016/j.bpa.2020.07.008. Epub 2020 Jul 18.
56. Maslach C, Jackson SE. The measurement of experienced burnout. *J Occup Behav*. 1981;2(2):99–113.
57. Maslach C. A Multidimensional theory of burnout. In: Cooper CL, editor. *Theories of Organizational Stress* Oxford University Press Inc.; 1999.
58. Rotenstein LS, Torre M, Ramos MA, et al. Prevalence of Burnout Among Physicians: A Systematic Review. *JAMA*. 2018 Sep 18;320(11):1131–1150. doi: 10.1001/jama.2018.12777.
59. Elshaer NSM, Moustafa MSA, Aiad MW, et al. Job stress and burnout syndrome among critical care healthcare workers. *Alexandria J Med*. 2018;54:273–277. doi: 10.1016/j.ajme.2017.06.004.
60. Lee Y. 11 October 2021. Hospitals are spending more money to hire and retain healthcare workers during the pandemic. This is bad for their margins. www.marketwatch.com/story/hospitals-are-spending-more-money-to-hire-and-retain-health-care-workers-during-the-pandemic-this-is-bad-for-their-margins-11633713620 (accessed 10/12/2021).
61. Chirico F. Combatting the shortage of physicians to alleviate work-related strain. *J Health Soc Sci*. 2017 Nov;2(3):239–242. doi: 10.19204/2017/cmbt11.

62. Amanullah S, Ramesh Shankar R. The Impact of COVID-19 on Physician Burnout Globally: A Review. *Healthcare (Basel)*. 2020 Oct 22;8(4):421. doi: 10.3390/healthcare8040421.
63. Soto-Rubio A, Giménez-Espert MDC, Prado-Gascó V. Effect of Emotional Intelligence and Psychosocial Risks on Burnout, Job Satisfaction, and Nurses' Health during the COVID-19 Pandemic. *Int J Environ Res Public Health*. 2020 Oct 30;17(21):7998. doi: 10.3390/ijerph17217998.
64. Danet Danet A. Psychological impact of COVID-19 pandemic in Western frontline healthcare professionals. A systematic review. *Med Clin (Barc)*. 2021 May 7;156(9):449–458. English, Spanish. doi: 10.1016/j.medcli.2020.11.009. Epub 2021 Jan 1.
65. Liu H, Zou HY, Wang HJ, Xu X, Liao JQ. Do emotional labour strategies influence emotional exhaustion and professional identity or vice versa? Evidence from new nurses. *J Adv Nurs*. 2020 Feb;76(2):577–587. doi: 10.1111/jan.14266. Epub 2019 Dec 4.
66. Maslach C, Schaufeli W, Leiter M. Job burnout. *Annu Rev Psychol*, 2001;52:397–422.
67. Schaufeli W.B. and Enzmann D. The burnout companion to study and practice: a critical analysis. London: Taylor and Francis; 1998
68. Lindblom KM, Linton SJ, Fedeli C, et al. Burnout in the working population: relations to psychosocial work factors. *Int J Behav Med*. 2006;13:51–59.
69. Kalimo R. The challenge of changing work and stress for human resources. The case of Finland. *J Tokyo Med Univ*. 2000;58:349–356.
70. Ahola K, Honkonen T, Isometsä E, et al. Burnout in the general population. Results from the Finnish Health 2000 Study. *Soc Psychiatry Psychiatr Epidemiol*. 2006;41:11–17.
71. Mazzella Ebstein AM, Sanzero Eller L, Tan KS, et al. The relationships between coping, occupational stress, and emotional intelligence in newly hired oncology nurses. *Psycho-Oncol*. 2019;28:278–283. <https://doi.org/10.1002/pon.4937>.
72. Liu H, Zou HY, Wang HJ, et al. Do emotional labour strategies influence emotional exhaustion and professional identity or vice versa? Evidence from new nurses. *J Adv Nurs*. 2020 Feb;76(2):577–587. doi: 10.1111/jan.14266. Epub 2019 Dec 4.
73. Chirico F, Magnavita N. The Crucial Role of Occupational Health Surveillance for Health-care Workers During the COVID-19 Pandemic. *Workplace Health Saf*. 2021;69(1):5–6. <https://doi.org/10.1177/2165079920950161>
74. Chirico F, Nucera G, Magnavita N. Protecting the mental health of healthcare workers during the COVID-19 emergency. *BJ Psych Int*. 2021;18(1):E1. <https://doi.org/10.1192/bji.2020.39>.
75. Kutluturkan S, Sozeri E, Uysal N, et al. Resilience and burnout status among nurses working in oncology. *Ann Gen Psychiatr*. 2016;15:33. <https://doi.org/10.1186/s12991-016-0121-3>.
76. Luceño-Moreno L, Talavera-Velasco B, García-Albuerne Y, et al. Symptoms of Posttraumatic Stress, Anxiety, Depression, Levels of Resilience and Burnout in Spanish Health Personnel during the COVID-19 Pandemic. *Int J Environ Res*. 2020;17:5514. <https://doi.org/10.3390/ijerph17155514>.
77. Luthar SS, Cicchetti D. The Construct of Resilience: Implications for Interventions and Social Policies. *Dev Psychopathol*. 2000;12:857–885. <https://doi.org/10.1017/S0954579400004156>.
78. Chirico F. Workplace Health Promotion as a good solution to the negative impact of the financial crisis on healthcare systems. *J Health Soc Sci*. 2018 Nov;3(3):211–214. Doi:10.19204/2018/wrkp1.

79. Arrogante O, Aparicio-Zaldivar E. Burnout and health among critical care professionals: The mediational role of resilience. *Intens Crit Care Nur.* 2017;42:110115. <https://doi.org/610.1016/j.iccn.2017.04.010>.
80. Chirico F, Ferrari G. Role of the workplace in implementing mental health interventions for high-risk groups among the working age population after the COVID-19 pandemic. *J Health Soc Sci.* 2021;6(2):145–150. <https://doi.org/10.19204/2021/rlft1>.
81. Chirico F. Spirituality to cope with COVID-19 pandemic, climate change and future global challenges. *J Health Soc Sci.* 2021;6(2):151–158. <https://doi.org/10.19204/2021/sprt2>.



© 2021 by the authors. This is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).