

Perils and Challenges for Healthcare Personnel with Underlying Conditions Working in Covid-19 Settings



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Abstract

Since December 2019, the coronavirus disease-2019 (COVID-19) pandemic has affected several nations worldwide with millions of confirmed cases and thousands of deaths. Health-care workers (HCWs) constitute the most important part in the battle against this disease. However, their close contact with patients with confirmed or suspected COVID-19 increases the risk of virus transmission and, subsequently, the risk of infection. This could be a significant blow in the function of each healthcare facility, limiting the available human resources and the level of the provided care. Nevertheless, special attention should be paid to HCWs who are at a higher age (>50 years of age) or face an underlying pathological (e.g., cancer, diabetes, and cardiovascular diseases) or psychiatric (e.g., anxiety and depression) condition, as there is mounting evidence regarding the increased risk of a severe COVID-19 condition in such individuals. Therefore, in this study, we focused on the currently available literature regarding the perils and challenges of HCWs with underlying conditions working in health-care facilities during the COVID-19 pandemic. Moreover, we aimed to suggest prevention measures and ways to treat the disease to reduce the risk of severe COVID-19 infection in such individuals. To this end, we queried PubMed and Google Scholar for novel works published up to September 2020.

Keywords: COVID-19; Health-care workers; Pandemic; Workforce; Psychological disorders

Abbreviation: COVID-19: Coronavirus Disease-2019; HCWs: Health-Care Workers; SARS-CoV-2: Severe Acute Respiratory Syndrome Coronavirus 2; IPC: Infection prevention and control; PPE: Personal Protective Equipment; PCR: Polymerase Chain Reaction

Introduction

Originating in Wuhan, China from unexplained causes, the novel coronavirus disease-2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has shown gigantic increase in the incidence and mortality rates worldwide [1]. Its outbreak led the World Health Organization to declare it as a pandemic on March 11, 2020 [2]. Indeed, the wide spread of the pandemic is depicted in the approximately 31 million confirmed cases and 1 million deaths worldwide to date, constituting the biggest crisis of the global community since World War II. The COVID-19 symptoms in the early stages include pneumonia, fever, myalgia, fatigue, diarrhea, and loss of smell [3]. Undoubtedly, the COVID-19 spread has affected the societies and the health systems of each affected country, and the healthcare systems could not be an exception. Indeed, the hospitals have

become the frontline in the battle against this disease and places where the risk of viral transmission is rapidly increasing [4].

Health care workers (HCWs) (i.e., paid, and unpaid persons serving in health care settings) are the spearhead in the effort to treat the infected patients and, therefore, they are exposed to hazards that put them at risk of infection [5]. It is clear that those with underlying pathological and psychological issues are at the spotlight and the protection of their health is of the utmost importance and a critical imperative [6-8]. Accumulating evidence shows that pre-existing conditions (such as cardiovascular diseases, obesity, and diabetes) as well as older age, among those with COVID-19, are related to a higher risk of hospitalization, admission to an intensive care unit, and death [9]. Moreover, from another point of view, the transmission of the virus to the

personnel and their subsequent self-isolation could limit the available human resources and the level of the provided care and, therefore, should be avoided [10].

Infection prevention and control (IPC) measures have been proposed and applied in each facility managing patients infected with COVID-19 [11]. Moreover, national and international recommendations regarding the management of patients with COVID-19 by the HCWs have been reported and are publicly available [12,13]. Nevertheless, their application is complicated, as the health-care systems and facilities have various structures and workforce composition [14]. In this work, we aimed to review the current and relevant articles in the literature to reveal the risks and challenges for HCW, and especially those with underlying conditions, who are fighting at the forefront against the COVID-19 pandemic.

Clinical workforce infection by SARS-CoV-2

Many studies have shown the increased risk of SARS-CoV-2 in HCWs, especially those working in the ICUs and the COVID-19 wards [7, 15-17]. Interestingly, a study performed in Wuhan, China reported that 29% of patients with COVID-19 were HCWs [18]. Especially, those aged >50 years and those with underlying diseases (e.g., cancer, diabetes, hypertension, and psychological disorders) are at a higher risk of death [19]. Indeed, the latter is reflected in the approximately 7,000 deaths and 540,000 infections of HCWs worldwide [20,21]. Interestingly, a recent study that collected data from confirmed COVID-19 cases in the UK and the USA stated that frontline HCWs had at least a threefold increased risk of COVID-19 infection compared with the general community, even after accounting for other risk factors [7].

Moreover, HCWs who have returned to their work after retirement to assist their co-workers in the frontline, present the highest mortality rates [22]. It is clear that the risk of infection varies according to their exposure and the adoption of their adherence to the recommended IPC measures, including the optimal personal protective equipment (PPE) use, which can dramatically reduce the infection rates and the subsequent mortality risks [23,24]. For example, reuse of PPE or inadequate PPE has been associated with a subsequent increased risk of COVID-19 [7]. Moreover, HCWs could be in high contact with patients who are asymptomatic, but still contagious, and presented in the health care facilities for other reasons [25].

Similarly, special attention should be paid in cases where the HCWs are present with their co-workers during processes where PPE is not usually used, such as meetings, lunch breaks, and grand rounds [25]. Finally, the highest risk of transmission is observed outside of the hospitals where the chances of distraction and relaxation of compliance with the protection measures are increased. Especially, interactions with friends and family members and improper use of face masks in crowded places (i.e.,

public transports, malls, or markets) can double or triple the risk of infection [26]. The aforementioned were confirmed by a study conducted in the Netherlands, which found that most infections of HCWs were acquired in the community [27].

Risks of infected HCWs

Undoubtedly, the first step regarding the protection of the infected by SARS-CoV-2 HCWs should be their monitoring and evaluation of their condition. As aforementioned, the risk categories are based on the presence of underlying diseases and their severity [11]. Indeed, our growing understanding of COVID-19 illustrates that the virus poses a particular threat to workers with underlying health conditions. Among these underlying conditions are cancer, chronic kidney disease, obesity, diabetes, heart failure, coronary artery diseases, and chronic obstructive pulmonary disease [28].

HCWs who have direct contact with patients not only have an increased likelihood of virus exposure, but also those with underlying conditions are at particular risk of developing adverse COVID-19 outcomes [29]. Interestingly, a recent work performed in the United States indicated that underlying conditions were reported in 71% of individuals admitted to hospital with COVID-19 and in 94% (173/184) of deaths [30]. Going to work, therefore, could mean increased likelihood of being exposed to a virus that disproportionately targets those with underlying medical conditions [23]. The lack of the appropriate PPE use has been cited as a common cause of death, while the management of older physicians has been proposed [31].

Mental health issues faced by the HCWs

Particular emphasis should be given in the mental condition of HCWs. HCWs are not immune to the psychological consequences of COVID-19. Specifically, the excessive workload/work hours, inadequate PPE, stress caused by the infected patients who are anxious regarding their health status and feeling of inadequate support could collectively lead to increased and not manageable psychological burden [32,33]. In addition, the sudden reversal of their role from HCWs to patients could lead to frustration, helplessness, adjustment issues, stigma, and fear of discrimination [34]. The aforementioned were confirmed by literature findings, as mood symptoms have been reported in HCWs during the COVID-19 pandemic [35].

Moreover, cases of individuals with underlying depression, which could be triggered in stressful and demanding situations (such as those faced by the HCWs) should also be carefully considered [32].

Especially, a study conducted in Nepal reported that approximately 38% of the HCWs on COVID-19 duty have anxiety and/or depression, [36] while the corresponding ratio in China has been reported to be 50.4%. [37]. Interestingly, the

authors have attributed the aforementioned increased ratios to factors such as deprivation of protective gear and resultant fear of becoming infected. Additionally, women and nurses were found disproportionately more affected from mental health consequences compared to men and physicians, respectively [38]. Moreover, mental morbidity in HCWs has been related to PPE inadequacy and, therefore, increased risk of exposure to infection [37,39,40]. Therefore, health authorities could establish multidisciplinary psychological health teams at regional as well as national levels for taking care of mental health problems and supplying psychological assistance to HCWs during the era of COVID-19 [32]. Technology could be a useful tool in this manner through the use of applications by the HCWs to communicate with specialized assistants [41].

Management of HCWs with underlying conditions in the era of COVID-19

The frequent monitoring of HCWs has been proposed as the first step for the management of HCWs who work in COVID-19 referral hospitals [11]. Especially, the Peking Union Medical College Hospital (Beijing, China) has suggested that all HCWs should undergo rapid and frequent nasopharyngeal and oropharyngeal polymerase chain reaction (PCR) tests. PCR tests of HCWs should be used to ensure that isolation of symptomatic staff is limited to individuals [42]. Further, these tests would allow the monitoring of the disease in a facility and early performance of the ideal therapeutic approach for confirmed positive cases and could also minimize the transmission of the virus [11]. Therefore, earlier recognition and intervention could lead to lower mortality rates [43].

Ideally, HCWs with an underlying condition should be restricted from work and remain quarantined with active monitoring for COVID-19 symptoms for 14 days after the date of last exposure or after undergoing two negative PCR tests [44]. Their return to work should be scheduled after two negative PCR tests [45]. Premature redeployment of quarantined or isolated health-care workers will possibly be required only in outstanding cases (i.e., for highly specialized individuals) [11].

Moreover, the education of staff regarding COVID-19 management and appropriate PPE use is of great importance. The risk is higher when there is lack of awareness regarding specific safety details. Actually, although the staff is used to wearing N95 masks, they sometimes do not fit well, thus, reducing their effectiveness. Therefore, the medical staff should be sufficiently trained in wearing the PPE and powered air-purifying respirators, which may also reduce resource consumption [46]. Further, an anteroom or a taped off area should be used by the staff to wear the PPE and organize the materials and medication needed for each case [47].

In addition, such individuals with a chronic underlying disease, especially those being at a higher risk, should be encouraged to

practice social distancing of at least 6 feet apart from others and avoid shaking hands or making hugs, not only inside the health-care facilities where the care for the observance of the measures is greater, but also in their private life [28]. Moreover, the hands should be washed for at least 20s, especially before eating or serving, and dried with single-use hand towels or paper towels [28].

Conclusion

HCWs constitute a population with a marked burden from COVID-19 pandemic. It is a common assumption that this population group is the backbone of any health system that guarantees the safety and health maintenance of the citizens. However, as HCWs exhibit a high prevalence of SARS-CoV-2 infection, with a significant proportion of the infected HCW being asymptomatic carriers, special attention should be given to those with underlying conditions. Therefore, specific recommendations for monitoring and managing such individuals should be available.

However, special notice should also be given to their personal responsibility. There is no doubt that the vast majority of physicians worldwide have shown tremendous devotion to ensure that their patients are adequately cared for under very difficult circumstances. Every day, these selfless warriors are giving their best in the battle against COVID-19, while cutting themselves off from their families and friends, even neglecting their own health. Although their sacrifices for the safety of humanity are priceless and deserve our respect, there is no room for new casualties. Therefore, most importantly, HCWs with an underlying disease, having the knowledge and the scientific background, should prioritize their clinical and psychological wellbeing and consider the risks and their ability to enter the workspace during this pandemic.

References

1. Velavan TP, Meyer CG (2020) The COVID-19 epidemic. *Trop Med Int Health* 25(3): 278-280.
2. Al-Balas M, Al-Balas HI, Al-Balas H (2020) Surgery during the COVID-19 pandemic: a comprehensive overview and perioperative care. *Am J Surg* 219(6): 903-906.
3. Ebrahimi M, Saki A, Rahim F (2020) Laboratory findings, signs and symptoms, clinical outcomes of Patients with COVID-19 Infection: an updated systematic review and meta-analysis. *medRxiv*.
4. Klompas M (2020) Coronavirus disease 2019 (COVID-19): protecting hospitals from the invisible. *Ann Intern Med* 172(9): 619-620.
5. Karampelias V, Spanidis Y, Kehagias I (2020) Surgical practice and operative surgical strategies during the COVID-19 pandemic: A commentary. *Ann Med Surg* 55: 47-48.
6. (2020) Characteristics of Health Care Personnel with COVID-19 - United States, February 12-April 9, 2020. *MMWR Morb Mortal Wkly Rep* 69(15): 477-481.
7. Nguyen LH, Drew DA, Graham MS, Amit DJ, Chuan-GG, et al. (2020) Risk of COVID-19 among front-line health-care workers and the general community: a prospective cohort study. *Lancet Public Heal* 5(9): E475-E483.

8. Workers HC, Conditions UM. (2020) Information for Health Care Workers with Underlying Medical Conditions.
9. Williamson EJ, Walker AJ, Bhaskaran K, Seb B, Chris B, et al. (2020) Factors associated with COVID-19-related death using OpenSAFELY. *Nature* 584(7821): 430-436.
10. Roth S, Clausen L, Mueller S (2020) COVID-19. Scenarios of a Superfluous Crisis.
11. Bielicki JA, Duval X, Gobat N, Herman G, Marion K, et al. (2020) Monitoring approaches for health-care workers during the COVID-19 pandemic. *Lancet Infect Dis* 20(10): e261-e267.
12. (2020) Coronavirus disease 2019 (COVID-19) pandemic: increased transmission in the EU/EEA and the UK – seventh update. European Center for Disease Prevention and Control.
13. (2020) Health worker exposure risk assessment and management in the context of COVID-19 virus. Organization WH. *Guia Provisional* 2(1): 1-6.
14. Pavolini E, Kuhlmann E. (2016) Health workforce development in the European Union: A matrix for comparing trajectories of change in the professions. *Health Policy* 120(6): 654-664.
15. Maxwell DN, Perl TM, Cutrell JB (2020) "The Art of War" in the Era of Coronavirus Disease 2019 (COVID-19). *Clin Infect Dis* 71(16): 2215-2217.
16. Cheng VC-C, Wong S-C, Yuen K-Y (2020) Estimating Coronavirus Disease 2019 Infection Risk in Health Care Workers. *JAMA Netw Open* 3(5): e209687.
17. Ali S, Noreen S, Farooq I, Bugshan A, Vohra F (2020) Risk Assessment of Healthcare Workers at the Frontline against COVID-19. *Pak J Med Sci* 36(COVID19-S4): S99-S103.
18. Wang D, Hu B, Hu C, Fangfang Zhu, Xing Liu, et al. (2020) Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China. *JAMA* 323(11): 1061-1069.
19. Wu Z, Mc Googan JM (2020) Characteristics of and Important Lessons from the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases from the Chinese Center for Disease Control and Prevention. *JAMA* 323(13): 1239-1242.
20. (2020) Global: Amnesty analysis reveals over 7,000 health workers have died from COVID-19. Amnesty International.
21. Organization PAH. COVID-19 has infected some 570,000 health workers and killed 2,500 in the Americas, PAHO Director says - PAHO_ WHO _ Pan American Health Organization.
22. Zhan M, Qin Y, Xue X, Zhu S (2020) Death from Covid-19 of 23 Health Care Workers in China. *N Engl J Med* 382(23): 2267-2268.
23. Verbeek JH, Rajamaki B, Ijaz S, Riitta S, Elaine T, et al. (2020) Personal protective equipment for preventing highly infectious diseases due to exposure to contaminated body fluids in healthcare staff. *Cochrane database Syst Rev* 4(4): CD011621.
24. Schwartz J, King C-C, Yen M-Y (2020) Protecting Healthcare Workers During the Coronavirus Disease 2019 (COVID-19) Outbreak: Lessons from Taiwan's Severe Acute Respiratory Syndrome Response. *Clin Infect Dis* 71(15): 858-860.
25. Belingheri M, Paladino ME, Riva MA (2020) Beyond the assistance: additional exposure situations to COVID-19 for healthcare workers. *J Hosp Infect* 105(2): 353.
26. Reusken CB, Buiting A, Bleeker-RC, Bram D, Mariëtte H, et al. (2020) Rapid assessment of regional SARS-CoV-2 community transmission through a convenience sample of healthcare workers, the Netherlands, March 2020. *Euro Surveill* 25(12): 2000334.
27. Sikkema RS, Pas SD, David FN, Áine OT, Jaco V, et al. (2020) COVID-19 in health-care workers in three hospitals in the south of the Netherlands: a cross-sectional study. *Lancet Infect Dis* 20(11): P1273-1280.
28. (2020) Certain Medical Conditions and Risk for Severe COVID-19 Illness. Centers for Diseases Control. National Center for Immunization and Respiratory Diseases (NCIRD).
29. Gibson DM, Greene J (2020) Risk for Severe COVID-19 Illness Among Health Care Workers Who Work Directly with Patients. *J Gen Intern Med* 35(9): 2804-2806.
30. Clark A, Jit M, Warren-GC, Bruce G, Harry HXW, et al. (2020) Global, regional, and national estimates of the population at increased risk of severe COVID-19 due to underlying health conditions in 2020: a modelling study. *The Lancet Global Health* 8(8): E1003-E1017.
31. Ing EB, Xu QA, Salimi A, Torun N. (2020) Physician deaths from corona virus (COVID-19) disease. *Occup Med (Lond)* 70(5): 370-374.
32. Spoorthy MS, Pratapa SK, Mahant S (2020) Mental health problems faced by healthcare workers due to the COVID-19 pandemic–A review. *Asian J Psychiatr* 51: 102119.
33. Cai H, Tu B, Ma J, Limin C, Lei Fu, et al. (2020) Psychological Impact and Coping Strategies of Frontline Medical Staff in Hunan Between January and March 2020 During the Outbreak of Coronavirus Disease 2019 (COVID-19) in Hubei, China. *Med Sci Monit* 26: e924171.
34. Rana W, Mukhtar S, Mukhtar S (2020) Mental health of medical workers in Pakistan during the pandemic COVID-19 outbreak. *Asian J Psychiatr* 51: 102080.
35. Pappa S, Ntella V, Giannakas T, Giannakoulis VG, Papoutsis E, et al. (2020) Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis. *Brain Behav Immun* 88: 901-907.
36. Gupta AK, Mehra A, Niraula A, Khagendra K, Saroj PD, et al. (2020) Prevalence of anxiety and depression among the healthcare workers in Nepal during the COVID-19 pandemic. *Asian J Psychiatr* 54: 102260.
37. Lai J, Ma S, Wang Y, Zhongxiang C, Jianbo Ht al. (2020) Factors Associated with Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. *JAMA Netw open* 3(3): e203976.
38. Nirmita Panchal, Rabah Kamal, Kendal Orgera, Cynthia C, Rachel G, et al. (2020) The Implications of COVID-19 for Mental Health and Substance Use | KFF. Kaiser Fam Found.
39. Wu PE, Styra R, Gold WL (2020) Mitigating the psychological effects of COVID-19 on health care workers. *Can Med Assoc J* (17): E459-E460.
40. Du J, Dong L, Wang T, Chenxin Y, Rao F, et al. (2020) Psychological symptoms among frontline healthcare workers during COVID-19 outbreak in Wuhan. *Gen Hosp Psychiatry* 67: 144-145.
41. Xiang Y-T, Yang Y, Li W, Ling Z, Qinge Z, (2020) et al. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *The Lancet Psychiatry* 7(3): 228-229.
42. Black JRM, Bailey C, Przewrocka J, Dijkstra KK, Swanton C (2020) COVID-19: the case for health-care worker screening to prevent hospital transmission. *Lancet* 395(10234): 1418-1420.
43. Sun Q, Qiu H, Huang M, Yang Y (2020) Lower mortality of COVID-19 by early recognition and intervention: experience from Jiangsu Province. *Ann Intensive Care* 10(1): 33.

44. RKI - Coronavirus SARS-CoV-2 - Optionen zum Management von Kontaktpersonen unter medizinischem Personal bei Personalmangel. Robert Koch Institut.
45. Physicians RC of. COVID-19 Keeping our Workforce Safe Healthcare staff adjustments with underlying health conditions: implications.
46. Brindle M, Gawande A (2020) Managing COVID-19 in Surgical Systems. *Ann Surg* 272(1): e1-e2.
47. Chew M-H, Koh FH, Ng KH (2020) A call to arms: a perspective of safe general surgery in Singapore during the COVID-19 pandemic. *Singapore Med J* 61(7): 378-380.



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