Unforeseen challenges to global health system, in particular context to COVID-19 pandemic and health care personnel

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**ABSTRACT**

Coronavirus disease 2019 (COVID-19) is an infectious disease which has spread throughout the world in a matter of approximately three months only. The disease is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), and is the causative agent of a very fatal disease that has had global implications, in healthcare, medical resources and the financial economies. The SARS-CoV-2 has been suggested to have a zoonotic origin, based on the reports of the virus originating from the animal market in Wuhan, China. The disease is spread amongst humans via direct contact and respiratory droplets. The virus mainly infects the respiratory system and also involves other major organ systems. As this is a novel coronavirus, there has not been many studies regarding the virus’s infectivity and treatment. However, since its emergence, efforts have been made to differentiate it from other diseases having a similar presentation, for treatment and for production of a vaccine. In this manuscript, we aim to highlight the important traits of the novel coronavirus, the disease COVID-19 and its presentation. The particular focus is on the effects of COVID-19 on human health and its available therapeutic measure. At the time of this pandemic, the global health systems were not adequately sufficed to appropriately deal with it. Most importantly, and unfortunately, the health care personnel and their health is being largely overlooked during the COVID-19 pandemic. The manuscript is, therefore, an effort to draw the world’s attention towards the role of health care workers, the problems they are facing as the frontline soldiers in this unforeseen battlefield and their sustenance during this COVID-19 pandemic situation. The doctors, nurses and other paramedical staff is dealing the COVID-19 suspects and patients on daily basis with merely available precautionary measures across the globe, consequently putting their lives and wellbeing on risks for the sake of humanity. And, with the support of scientific literature and other reliable resources, we aimed with this viewpoint manuscript to highlight the COVID-19 related challenges to global health system, in particular context to health care personnel.

**Introduction**

Since the emergence of novel coronavirus disease from China in December 2019, the disease causing virus has spread over to 210 countries and territories around the world, infecting about 19,817,570 people worldwide and causing 729,748 deaths (World Health Organization [https://www.worldometers.info/coronavirus/]). The United States, currently, is the worst hit, with 5,150,060 people infected and more than 165,074 deaths. In Europe, Italy and Spain have had the greatest death toll due this virus, with 35,203 and 28,503 deaths respectively (World Health Organization, [https://www.worldometers.info/coronavirus/]). As a track record, a cluster of patients with pneumonia of undetermined etiology emerged in Wuhan, China in December 2019. The histories and information gathered from those early patients, traced this virus back (and even linked in some ways) to the animal market in Wuhan. These observations prompted the theory that the pneumonia cases of unknown cause might have an etiologic factor, potentially emerged from the said market (Rothan & Byrareddy, 2020). Later, it was reported that the person to person transmission occurs through direct contact and/or through respiratory droplets (Li et al., 2020b). This transmission mode of COVID-19 virus has led to the rapid spread of the disease to almost all parts of the globe. The World Health Organization has named the disease as Coronavirus Disease 2019 (COVID-19), whereas the International Committee on Taxonomy of Viruses has
named the novel virus as Severe Acute Respiratory Syndrome coronavirus 2 (SARS-CoV-2) on the 11th of February 2020 (Tang et al., 2020).

Primarily in Wuhan, a large number of COVID-19 infected people were, in some way, exposed to the wet animal market, hypothesizing that animals are the most likely origin of this novel coronavirus. Currently, the mammals and birds are the only known reservoirs of this virus. For instance, analysis of the novel coronavirus showed that 88% of the COVID-19 genome is shared with bat-derived severe acute respiratory syndrome (SARS) like coronavirus, and about 50% of the genome is matched with Middle East respiratory syndrome (MERS-CoV) (Rothan & Byrareddy, 2020). These analyses have demonstrated that mammals are the most likely link between humans and Coronavirus disease 2019 (COVID-19). These genomic studies also showed that COVID-19 is part of the genus beta-coronavirus, and may infect humans, bats and animals. Though, studies have shown the COVID-19 route as likely to be from bats to humans, spreading globally through human-to-human contact. These analyses have demonstrated that mammals are the most likely link between humans and Coronavirus disease 2019 (COVID-19). These genomic studies also showed that COVID-19 is part of the genus beta-coronavirus, and may infect humans, bats and animals. Though, studies have shown the COVID-19 route as likely to be from bats to humans, spreading globally through human-to-human contact. These analyses have demonstrated that mammals are the most likely link between humans and Coronavirus disease 2019 (COVID-19). These genomic studies also showed that COVID-19 is part of the genus beta-coronavirus, and may infect humans, bats and animals. Though, studies have shown the COVID-19 route as likely to be from bats to humans, spreading globally through human-to-human contact. These analyses have demonstrated that mammals are the most likely link between humans and Coronavirus disease 2019 (COVID-19). These genomic studies also showed that COVID-19 is part of the genus beta-coronavirus, and may infect humans, bats and animals. Though, studies have shown the COVID-19 route as likely to be from bats to humans, spreading globally through human-to-human contact.

As for signs of disease, COVID-19 is symptomatic as well as asymptomatic. COVID-19 has a similar structure to that of SARS-CoV which binds to human lung epithelial cells via angiotensin-converting enzyme 2 (ACE-2). Similarly, the COVID-19 is likely to bind to the same site i.e., ACE-2 (Li et al., 2020b). The virus duplicates in the host cells, and directly causes inflammation of the lungs, which causes the respiratory symptoms associated with COVID-19. And, during the lung inflammation, a large number of cytokines are released leading to the over activation of the body immune response (Li et al., 2020b). Patients with mild disease were reported to recover in about 7 days, while patients with severe COVID-19 progressed to respiratory failure due to acute respiratory distress syndrome, which may even lead to death, in some circumstances (Adhikari et al., 2020).

Symptoms of COVID-19 start after an incubation period of approximately 5.2 days (Rothan & Byrareddy, 2020). In about 15% of the patients, the disease progresses to a severe and sometimes fatal form of pneumonia. Severe COVID-19 can lead to respiratory distress, multi-organ failure and intravascular coagulopathy (Lippi and Henry, 2020). The main symptoms of COVID-19 fever, by now, are fatigue, headache, cough (either productive or non-productive or even both), dyspnea and gastrointestinal symptoms like diarrhea, nausea and vomiting (Tang et al., 2020). These clinical features may be presented as acute respiratory distress syndrome (ARDS), acute cardiac injury and increased incidence of ground-glass opacities on chest, which can ultimately lead to death, in some cases (Rothan & Byrareddy, 2020). Chest X-rays of some COVID-19 patients showed multiple patchy shadows in both lungs (Xu et al., 2020) while CT scans showed bilateral ground glass opacities as well (Rothan & Byrareddy, 2020).

Apart from targeting the lungs, COVID-19 produces a systemic illness which targets multiple organs and leads to multi-organ failure (Lippi, et al., 2020). During the period of acute stress and an overwhelming immune response to the coronavirus, the body releases increased amount of catecholamines which have a direct toxic effect on heart leading to vasospasm, arrhythmias and sudden cardiac death (Channappanavar & Perlman, 2017). The angiotensin 2 release caused by binding of virus to ACE-2 receptors results in high blood pressure, cardiomyocyte hypertrophy and increased heart load, leading to occurrence of coronary artery disease (Li et al., 2020a). In another study by Xu and team (2020), biopsy samples taken from a patient who died of COVID-19 on the 14th day of illness showed evidence of ARDS caused by the virus. Histological examination showed diffuse bilateral alveolar damage and fibrous exudates. The lungs showed hyaline membrane formation and shedding of pneumocytes. Interstitial infiltrates of lymphocytes was shown in both lungs, but there were no intra-nuclear or intra cytoplasmic inclusion bodies seen (Xu et al., 2020). The study also demonstrated mononuclear infiltrates in the heart and moderate microvascular steatosis in the liver tissues (Xu et al., 2020).

The above mentioned synthesis showed a range of studies which has recently overwhelmed the focus of medical research work on COVID-19 genomics, infection patterns and epidemiology. But the work on its cure and treatment, particularly the vaccine preparations, is in its infancy yet. While the global health systems were not adequately sufficed to deal such pandemic and most importantly the health care personnel and their health is being largely overlooked during COVID-19 pandemic. The frontline soldiers in this unforeseen battlefield are doctors, nurses and other paramedical staff which deal COVID-19 suspects and patients on daily basis with merely available precautionary measures across the globe, consequently putting their lives and wellbeing on risks for the sake of humanity. This manuscript is, therefore, focused to highlight (a) the medical infrastructure available to deal COVID-19 pandemic and...
(b) the current situation of health care workers while dealing this deadly viral disease.

Medical infrastructure to deal COVID-19 pandemic

Biomarkers for COVID-19

Biomarkers serve a large role in identifying disease, progress and pathology and also in disease treatment and management. Although COVID-19 is a novel coronavirus with a lack of established biomarkers, there have been studies in patients diagnosed with the disease to confirm specific levels of markers to help identify the disease and its severity. Thrombocytopenia is common in ill patients and in a recent study, the decreased platelet count was found associated with a threefold enhanced risk of severe COVID-19 (Lippi et al., 2020). This in turn, can lead to intravascular coagulopathy. As lung can be the site of platelet release, ARDS caused by the virus may result in deranged and fragmentation of these platelets. Lymphocyte count is also associated with severity in COVID-19. Survivors had significantly increased lymphocyte count than patients who died (Henry, 2020). Peripheral CD4 and CD8 counts were also decreased in COVID-19 patients. Lymphopenia was common in patients however their status was hyper-activated, with high concentrations of cytotoxic granules and perforins in CD8 cells (Xu et al., 2020). Higher inflammatory cytokines, such as IL-6, IL-7, IL-1RA, IL-9, IL-10 were observed in patients, with high levels of C-reactive protein (CRP), while erythrocyte sedimentation rate (ESR) and D-dimers were also found in almost all COVID-19 patients (Rothan & Byrareddy, 2020).

Moreover, dyspnea and oxygen saturation (SpO2) were used in another study as prognostic biomarkers. Patients reporting shortness of breath as initial symptom of COVID-19 were more likely to die than those who did not report such initial symptoms. As a continuous variable, it was found for each unit increase in SpO2, mortality risk was decreased by approximately 8%. Dyspnea and SpO2 were significantly associated with multivariable outcomes (Xie et al., 2020). But, none of these reports have yet claimed conclusive biomarkers to affirmatively ensure the medical identification of COVID-19 disease in tentative patients of corona viruses. Therefore, a lot is still needed to do in this direction to better assist the health care systems of the world against COVID-19 pandemic.

Diagnosis and management of COVID-19

Currently, the diagnosis of COVID-19 is dependent upon real time polymerase chain reaction (RT-PCR) assay of nasopharyngeal and throat swabs. While, human involvement and technical problems do exist for such diagnosis. For instance, the sampling done by a single trained nurse and multiple nurses exhibited an effect on the diagnosis results. For appropriate sample collection, highly trained or experienced nurse may improve the diagnostic sensitivity with throat swabs (Ye et al., 2020). While the lingual swab is convenient but can possibly produce the same artefact. However, the positive rate of throat swabs is higher than that of lingual swabs for the detection of COVID-19, when it was collected by a single experienced nurse (Ye et al., 2020). When multiple nurses took both lingual and throat samples, there was no significant advantage of one from the other. Actually, the diagnostic sensitivity of COVID-19 increased when samples were taken from both sites (Ye et al., 2020). And, such dual nature sensitive diagnosis requires more workforce, time and money which all cumulatively cause a big constrain to an efficient health care system.

For molecular diagnosis, the E, N and S genes of the SARS-CoV-2 virus are the detection targets frequently used by RT-PCR (van Kasteren et al., 2020). According to some reports, RT-PCR reported only 57% positives among specimens from fever clinics who had symptoms of the virus. A number of patients showed progressive multiple ground glass opacitates in the lungs but negative PCR results (Wang, 2020). Different manufacturers of the PCR kits for COVID-19 diagnosis are: Altona Diagnostics, BGI, CerTest Biotec, KH Medical, Primer Design, R-Biopharm AG, Seegene etc. A comparison between these commercial kits was also done by van Kasteren and his team. According to their results, all the kits had more than 96% PCR efficiency while the viral genome detection through these kits, yielded different results. Biopharm positively detected highest number of clinical samples i.e., 13/13. BGI, KH Medical and Seegene detected 12 out of 13 samples. CerTest Biotec 11/13, Altona Diagnostics and Primer Design detected 10/13 samples correctly (van Kasteren et al., 2020). On parallel, the S, N, E and M genes of the virus are the main antigenic targets of antibodies against this virus (Li et al., 2020a). And, different kits for the antigen detection test for SARS-CoV-2 virus are RapiGen, Liming Bio, Savant and Bioeasy. Bioeasy showed the highest accuracy for detecting antigen with 89.2% accuracy. As for the antibodies, IgM and IgG are produced within 5–7 days and 10–15 days of infection respectively (Li et al., 2020a). And, the manufacturers of antibody detection tests include Maglumi, Alltest, Clungene, VivaDiag, StrongStep, OrientGene, Dynamiker and MultiG. Specificity of these kits is more than 85%, while the total sensitivity ranges from 32% for the detection of a specific antibody to 84% (Li et al.,
2020a). A combination of both methods, RT-PCR and antibody tests increases the sensitivity of detecting infection to 98.6% (Wang, 2020). Combination of both methods is beneficial for screening and confirming COVID-19, in late stages of the disease as well, because the viral load fluctuates at different phases (Wang, 2020). Studies have also reported chest CT scan having sensitivity of 80–90% and specificity of 82–96% for detecting lung lesions in patients with COVID-19 (Majidi & Nikslo, 2020).

On the side of COVID-19 cure, at present, there are no specific anti-viral drugs or vaccines for the treatment or management of COVID-19. The main therapies with which patients are being treated are broad-spectrum anti-viral drugs like anti-retroviral drugs such as Nucleoside analogs and HIV protease inhibitors (Rothan & Byrareddy, 2020). Other anti-viral drugs being used are interferon, ganciclovir and oseltamivir. Prompt use of corticosteroids should, however, be considered for patients to prevent ARDS development, along with ventilation (Xu et al., 2020). A combination of two HIV protease inhibitors i.e., Lopinavir and Ritonavir has also been put under trial and a slightly lower number of deaths was found in patients provided with this regimen, but it does not affect viral shedding and thus no benefit was observed for clinical improvements (Baden & Rubin, 2020).

As the COVID-19 is majorly a respiratory disease, the development of ARDS and the consequent hypoxemia can lead to severe respiratory failure and ultimately the death. Therefore, it is essential that monitoring of vital signs specifically SpO2 should be rapidly done. At presentation, the oxygen supplementation is provided by either nasal cannula or mask in moderate to severe respiratory compromised disease scenarios. Non-invasive ventilation is not done in critical ARDS and COVID-19 associated pneumonia, because non-invasive ventilation, in no way, affects the course of the disease (Namendys-Silva, 2020). In patients with acute refractory respiratory failure, intubation and invasive ventilation, done in a timely manner, is superior to both high-level oxygen therapy and bi-level positive airway pressure ventilation (Meng et al., 2020). All these management strategies result in better oxygenation, opening of the collapsed alveoli due to ARDS and faster time for the lungs to heal. But currently, the isolation and quarantine of patients and COVID-19 positive individuals, and strict measures to minimize the personal contact, remains the only way to decrease the spread of COVID-19 (Baden & Rubin, 2020). While, noticeably, health care workers during diagnosis and management of COVID-19 are on constant risk to get infected and/or to be physically and psychologically compromised.

**Healthcare workers in COVID-19**

Health care personnel are the factual frontline soldiers across the whole globe against COVID-19 and/or any other similar situation. Though, patients’ take care is the professional duty of healthcare workers but their leisure and rest is also very important (Figure 1). The sudden coronavirus pandemic has stretched the medical resources all around the world to the brink. Many countries being hit hard by the disease are facing immense shortage of healthcare workers, ventilators, and basic necessities like masks, gloves and personal protection equipment. To tackle a disease of such proportion and such a nature

![Figure 1. Schematic depiction of the healthcare personnel wellbeing during the COVID-19 pandemic situation.](image-url)
requires a very large amount of assets and resources. The average hospital only has enough supplies for an average load of patients. The epidemic sweeping across countries was completely uncalled for and thus led to a global dearth of resources. To address COVID-19, the most important resource to be used against is the workforce of healthcare workers. Because till date, no specific treatment has been affirmed for COVID-19, the management of infected patients thus mainly depends on supportive care only. Therefore, continuous monitoring and treatment of unpredictable and exceptionally large number of patients infected with COVID-19 virus has led to the negative impacts on healthcare workers in and outside the hospital settings. In this regard, the problems being faced by the healthcare workers include increased working hours, burnout, fatigue, stress, psychological imbalance, emotional distress, substandard personal protection equipment (PPEs), increased infection risk, physical health issue and anxiety of the healthcare workers themselves and of their families as well. All these factors combine to compromise the efficacy of the hospital, its workforce and workflow. Thus, a large part of tackling the pandemic of COVID-19 and to reduce its spread even further depends on the well-being and sustenance of the workers which have taken the utmost responsibility of dealing with the disease on the front lines. The more effectively the healthcare workers are used, the better the world can fight against the pandemic like coronavirus (Fraher et al., 2020). The recommendations in following sections may, thus, contribute to uplift the capacity building of efficient health care systems worldwide.

**Increasing the workforce**

Increased working hours and multiple shifts to deal with a large number of COVID-19 patients has resulted in exhaustion and fatigue of the health care workers. This in turn may lead to compromised efficiency of care being provided to the patients. In this regard, one way to deal with this ever-increasing influx of patients is to add more healthcare workers to the arsenal (Figure 1). This will help in better management of patients as well as decreasing the workload of existing healthcare workers. But, the real dilemma is the challenge that how these numbers of medical personnel can be increased? For instance, the whole process of evaluating suspected COVID-19 patients, their admission in the hospital, management, treatment etc. depends upon a large group of people working in different departments. Hospitals have triage, health-care workers in the emergency department, nurses, ICU staff and doctors. Increasing numbers in different departments can thus be a way of increasing the workforce. In this regard, students (medical students and nursing students), nearing the end of their education or in their final year can be given a license, and be trained to deal with certain aspects of the patient management; keeping it as simple as history taking from patients or taking vitals etc. (Figure 1). Healthcare workers such as dentists, technicians, chiropractors can also be trained to conduct screenings, triage, follow up of patients and provide community education (Fraher et al., 2020). Moreover, volunteers from other similar discipline of life can also be called in to deal with certain (for instance administration) aspects of patient management which have reduced or almost no contact with patients, such as telemedicine, data gathering and follow up of patients (Figure 1).

As per available data, around 6.1% of COVID-19 patients have been classified as critical (respiratory failure, multiple organ dysfunction etc.) and 13.8% as severe (SpO2 < 92%, increase in lung infiltrates > 50%), while in Italy, 12% of all cases required ICU admission and care (Phua et al., 2020). Therefore, increasing the number of ICU staff is pivotal in the management and care of COVID-19 patients. Nurses and healthcare staff from other departments such as surgery, anesthesia and medicine should be trained for critical care. Seminars, lectures and classes should be conducted on intubation, extubation, ventilator settings and working, criteria of admission and supervision of all patients in the ICU. And, maximum number of nurses and healthcare workers should be ensured to attend such interactive learning. This exercise will in turn divide the workload of the already existing ICU staff and nurses, thus, leading to better working hours and overall efficiency.

**Decreasing infectivity among healthcare workers**

Health care workers are expected to be at an increased risk of infection because of their direct exposure to COVID-19 patients (Bhagavathula, Aldhaleei, Rahmani, Mahabadi, & Bandari, 2020). The International Council of Nurses (ICN) has gathered information that on average 7% of all confirmed COVID-19 patients are healthcare workers (ranging up to 18%) with more than 600 deaths in nursing staff as of June 2020. Such 7% of the total infected patients worldwide would bring the number to around 1,393,000 healthcare workers infected with COVID-19, based on estimates. The ICN showed further concerns that governments across the globe are turning a blind eye on this matter, unfortunately neither collecting the data in systematic way nor reporting such information to international forums which may cost even more lives (Catton, 2020). In United States, being one of the worst hit countries, a total of 124,813 healthcare workers have been affected, with deaths numbering at 600 amongst
healthcare workers according to the Center of Disease Control and Prevention (as of August 8, 2020).

According to data compiled by the Anadolu Agency, a total of 12,454 healthcare workers have been affected by COVID-19 in the Asia-Pacific region, while 171 have succumbed to the virus (https://www.aa.com.tr/en/asia-pacific/asia-pacific-health-workers-hit-hard-by-covid-19/1873247). The number of doctors, nurses and paramedical staff infected with the virus in Pakistan stands at 3,196 and 31 healthcare personnel including 20 doctors, 2 nurses, 8 allied staff and one medical student have lost their lives fighting the ongoing pandemic (https://www.aa.com.tr/en/asia-pacific/asia-pacific-health-workers-hit-hard-by-covid-19/1873247). Amnesty International (AI) has collated and analyzed a wide range of available data showing that over 3000 health workers are known to have died after contracting COVID-19 in 79 countries around the world. According to AI’s monitoring, the countries with the highest numbers of health worker deaths thus far include the USA (507), Russia (545), UK (540, including 262 social care workers), Brazil (351), Mexico (248), Italy (188), Egypt (111), Iran (91), Ecuador (82) and Spain (63). One of the worst hit countries, Italy, data analysis shows that 20% of all healthcare workers dealing with patients have tested positive for COVID-19 and infection amongst the nurses make up 9% of the total cases (Ali, Noreen, Farooq, Bugshan, & Vohra, 2020).

Early published literature in Spain, another badly hit country in Europe, indicated that around 9400 healthcare workers have been infected with the virus which is almost 15% of all the coronavirus cases in Spain (Ali et al., 2020). China has had around 3,300 medical personnel infected with 22 suffering from severe respiratory distress leading up to the death of these workers (Ali et al., 2020). In brief, all over the world, the people responsible for the care of the patients have been affected to an extent ranging from social workers, medical staff, nurses and doctors.

As the above statistics are very alarming, therefore, it is of utmost importance that healthcare workers should be protected from COVID-19 infection. Apart from maintaining their own health for work, healthcare workers act as a source, spreading the disease unknowingly to their families and friends. In this regard, first of all, basic necessities like gloves and masks should be made available in all hospitals. Personal protection equipment (PPE) should be provided to the healthcare workers who deal with suspicious and suspected patients of COVID-19 (Figure 1). These personnel include workers in the emergency department, triage, ICU, medical wards and isolation wards. No one without proper PPE should be in contact with a suspected patient. If in medical wards, there is no PPE, then healthcare workers should try to protect themselves in the best way they can. For instance, wearing double gloves and double masks can limit the transmission via direct contact and respiratory droplets’ spread by coughing and sneezing. Wearing lab coats and overalls over scrubs or clothes can reduce the contact of clothes with possible infectious sources. After use, washing of clothes and lab coats with spirit containing 71% ethanol can potentially reduce the possible infectivity (Kampf, Todt, Pfaender, & Steinmann, 2020). The gloves and masks should be discarded after use, since till date there is no FDA approved process for recycling of already used material and/or equipment. Sanitizers should also be provided in all wards of the healthcare centers and regular use of sanitizers should be made a norm, especially among the healthcare workers.

Moreover, the decreased exposure time to patients can also help in the low rates of infection among healthcare workers. As advocated above, increasing the number of health care workers will result in a division of labor. Ultimately, the time spent by one healthcare worker around patients which may or may not be suspected COVID-19 patients, will be reduced. Rotations and time tables should be followed, that will also decrease the time being exposed to the patients and will further decrease the exhaustion and fatigue amongst nurses who are providing non-stop care to critical patients. Tele-medicine could be incorporated into hospitals, which would aid in history taking, screening and evaluating seriousness of patients without having them to come to the hospital. Trainings should also be provided in tele-medicine sections of health care service while hospitals and clinics should start focusing and implementing the tele-medicine as a foremost and prime method to assess patients. This would benefit both the healthcare workers and patients. Tele-medicine has the added benefits of utilizing quarantined healthcare workers and retired healthcare workers (Moazzami, Razavi-Khorasani, Dooghaie Moghadam, Farokhi, & Rezaei, 2020). Protection of the staff and medical personnel should remain a primary concern and a high priority, during this COVID-19 pandemic.

Psychological well-being of healthcare workers

During the current COVID-19 pandemic, the psychological stress to healthcare workers has been increasing, as a result of surging number of patients, the growing workload, rising working hours and continuously climbing deaths tolls. This stress in medical healthcare workers can trigger psychological problems to them such as anxiety, fear, depression, post-
traumatic stress disorder (PTSD), ultimately imposing an overall effect on their well-being and decision making (Rana, Mukhtar, & Mukhtar, 2020). In a study done in Singapore, out of 500 healthcare workers, 14.5% were found positive for anxiety, 8.9% for depression, 6.6% for stress and 7.7% were screened positive for PTSD (Tan et al., 2020). Healthcare workers’ mood also depended on their patients’ conditions. A lot of healthcare workers, especially the nurses were reported to be grieved when a patient expired (Liu et al., 2020). The feeling of helplessness and of not doing enough when a patient expires, along with sadness and the realization that their patient expires without their loved ones being their side cause a major emotional distress among many nurses (Law, 2020). Such psychological symptoms were higher in nurses, women and other people caring for COVID-19 patients. Many mental health related problems amongst doctors and nurses stem out from the fact that they unknowingly can transmit the virus to their own families (Law, 2020). With such realization, the only way to curb transmission to family and friends is to socially isolate oneself. Consequently, the long term chronic social isolation can increase the risk of a variety of health problems such as heart disease, depression, dementia and even death, increasing mortality by up to 29% (Miller, 2020).

It is, therefore, imperative that the mental well-being of healthcare workers is scrutinized and prioritized. Significance of mental health should not, in any way, be undermined as it is currently very crucial for the general well-being and efficiency of healthcare workers and ultimately of their patients. As a control measure, then, all doctors and nurses attending the severely sick COVID-19 patients should be screened for depression, generalized anxiety disorder and fear. The healthcare workers who have been infected with COVID-19 or are in quarantine and isolation should also be screened in a similar way. Such screenings should be made compulsory for all healthcare workers and psychiatric consultants should be arranged to all those who screen positive for even few signs of any mental health disease. Workers who do show signs and symptoms of mental fatigue should be provided with free therapy (and even medications, if required) to cope with any cognitive difficulties.

Very importantly, everyone has a way to de-stress and taking care of oneself is paramount. Therefore, healthcare workers should also pursue the activities in their free time that help them to cope with the stress (Figure 1). The healthcare personnel should carry on their hobbies, being at home or even in hospitals. These can be as simple as reading, meditation or something like exercise. Coping with unhealthy mechanisms such as smoking and alcohol should, though, be avoided. The healthcare workers should also be encouraged to express themselves and to communicate with each other and to people close to them. Awareness should be spread regarding signs and symptoms of depressive fatigue, anxiety, PTSD to healthcare workers as well as to non-medical personnel engaged in administrative assignments to deal the COVID-19 pandemic situation. This can be achieved via presentations, lectures, workshops, advertisements and general seminars. Furthermore, the support groups should be set up and all facilities regarding mental well-being of healthcare workers should be made easily accessible. After all, a healthy mind leads to a healthy body, and in this case the healthy minds in healthcare systems may better deal with the currently imposed COVID-19 pandemic.

Concluding remarks

Public health, indeed, is the best defense- that is mainly possible with the wellbeing of healthcare workers across the globe. Therefore, the world should improve the healthcare systems and further emphasize on public health via investing on novel diagnostic and management tools. In this COVID-19 pandemic, while efforts are being made for a cure and vaccines, even more effort is required for the sustenance, welfare and safety of healthcare workers. These personnel have the most important role in managing the disease and therefore the prosperity of healthcare workers is the chief component during this fight against COVID-19. Increasing the workforce, maintaining their security, their mental and physical well-being, dividing working hours are just some steps that can be taken to ensure efficiency and productiveness. Healthcare providers and governing bodies should take this matter as seriously as the disease itself. Healthcare workers are on the front line against all kinds of challenges that the COVID-19 pandemic is putting forward, and they are the main force with which we can hope to control the disease.

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