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Post-COVID-19 Syndrome and new challenges posed by climate change require an interdisciplinary approach: The role of occupational health services

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In 2009, a \textit{Lancet} commission declaring climate change as the “biggest global health threat of the 21st century” [1, p.1693] recommended that the health consequences of climate change should give priority on the agenda of every academic journal, scientific and professional conference, and university curriculum. Even before the pandemic, however, there was scant evidence to suggest that occupational disciplines had risen to this challenge, even though occupation is a well-known social determinant of health, which may be amplified by social and economic inequity, low health literacy, environmental degradation and climate change [2,3].

The current COVID-19 pandemic, is generating many challenges at any levels in our societies. For this reason, a comprehensive strategy (“syndemic approach”) has been indicated to address the ongoing COVID-19 pandemic, as it may interact with global inequity, other non-communicable diseases and climate change. Increasing prevention and resilience skills in our healthcare systems and society have been suggested as measures to protect the most vulnerable populations [4].

Millions of people will survive the SARS-CoV-2 infection, and, as a consequence, the number of individuals suffering from COVID-19 sequelae will dramatically increase over time [5]. Symptoms associated with SARS-CoV-2 infection are heterogeneous and may affect different systems such as respiratory (general fatigue, cough, sore throat, rhinorrhea, dyspnea), musculoskeletal (myalgias, arthralgias), gastrointestinal (diarrhoea, abdominal pain, vomiting), psychological (post-traumatic stress disorder, anxiety, depression, burnout syndrome, mood disorders, insomnia and sleep problems), neurocognitive (brain fog, cognitive impairment, dizziness), neurological (headaches, ageusia, anosmia) and autonomic (chest pain, tachycardia, palpitations). Many survivors of severe COVID-19 continue to complain of cardiological symptoms for long periods, even after their discharge from hospital [5-13].
A meta-analysis showed that post-COVID-19 symptoms are present in more than 60% of patients infected by SARS-CoV-2. Fatigue and dyspnea were the most prevalent post-COVID-19 symptoms, particularly 60 and ≥90 days after the infection, but other post-COVID-19 symptoms also included cough (20-25%), anosmia (10-20%), ageusia (15-20%) or joint pain (15-20%) [14].

Based on relapsing/remitting nature of post-COVID symptoms, Fernández-de-Las-Peñas and colleagues have proposed the following integrative classification: potentially infection related-symptoms (up to 4-5 weeks), acute post-COVID symptoms (from week 5 to week 12), long post-COVID symptoms (from week 12 to week 24), and persistent post-COVID symptoms (lasting more than 24 weeks) [13].

The expected difference in the prevalence of post-COVID-19 symptoms between hospitalized and non-hospitalized patients has not been confirmed [14], and post-COVID-19 syndrome has been even described in patients with mild infection, younger than 65 years and with no preexisting comorbidities [11,13,15]. For this reason, people with long-COVID or “long-haulers” of working age are likely to increasingly present health problems and impaired work ability when returning to work after COVID-19 infection. Therefore, their fitness for work could be temporarily or permanently compromised, and some of them could be result in unfitness for their actual job.

In European Union countries, occupational health physicians of private and public sectors are appointed by employers to carry out evidence-based health surveillance programs to protect and prevent occupational risks, which should be normally organized within occupational health services (OHSs). Occupational health surveillance is mandatory when certain workplace hazards are present. It has the advantage of detecting adverse health effects resulting from occupational exposures as early as possible by avoiding the onset of occupational and work-related diseases, and the advantage to inform the effectiveness of preventive measures resulting from the risk assessment and management process [16–20].

Workplace health promotion (WHP) programs, on the contrary, are voluntary for employers and employees and constitute an important pillar of the holistic workplace health management strategy [21–23]. WHP has the purpose to promote higher levels of workers’ global wellbeing, according to the “Total Worker Health” concept [24–26].

However, due to their intrinsic characteristics, either occupational health or WHP programs could fail to protect the health of many workers affected by post-COVID 19 symptoms.

OHSs are multidisciplinary teams composed by occupational physicians and occupational therapists, psychologists, nurses, hygienists, ergonomists, and safety managers. Occupational or physical therapists should be included in OHSs set up to address post-COVID-19 disorders among workers, as specific rehabilitation programs could be developed on the basis of workers’ functional impairment.

Occupational therapists, indeed, may be particularly useful when workers return to work, because they perform functional capacity evaluations, and provide workplace mental health interventions to improve work performance and productivity. By collaborating with occupational physicians and psychologists, OHS and WHP programs could be joined to protect workers affected by COVID-19 syndrome and enhance the global well being of the workers.

Despite the growing clinical relevance of post-COVID-19 syndrome, there is minimal information available on the organizational response of health services to this condition. We believe that an interdisciplinary approach including primary care providers and occupational health and safety professionals, with the contribution of specialists in cardiology, neurology, psychiatry, or respiratory diseases may benefit companies and society

A strict cooperation between occupational and public health stakeholders in the framework of multidisciplinary OHSs, furthermore, should be developed during and even in the post-COVID-19 era [24–26]. OHSs may assist workers affected by COVID-19 infection or post-COVID-19 symptoms by integrating counselling, testing, health surveillance, and medical assistance at individual and group levels, according to a more comprehensive approach in line with the challenges that climate change poses to us, including global warming and extreme weather, and vectorborne diseases in
outdoor workers, and new emerging issues concerning migrant workers and the ageing of the workplace, as well as new technologies and psychosocial risk factors deriving from new working organizations (i.e., working from home) [27–30].

Healthcare systems across the world are struggling to meet people’s health needs, due to global COVID-19 crisis, shortage of physicians, budget constraints, and subsequently, high workload, turnover intention and burnout levels among healthcare workers [3]. For this reason, OHSs with multidisciplinary teams of experts collaborating with local healthcare systems (primary care providers, hospitals, and local health services) could address the needs of workers affected by post-COVID-19 symptoms and drive the best holistic strategies for responding to the new global health challenges posed not only by COVID-19, but also by new workplace hazards requiring a complex and overall approach for prevention, protection, and return to work of both healthy and disabled workers [31,32].

For instance, it was proposed that an integrated and multidisciplinary model with employee participation in prevention activities and occupational health nurses assuming leadership role in health and safety management of their organizations [33], may be effective to meet these needs. New interdisciplinary approaches would allow the government to address shortage of healthcare professionals and save money for health expenditure.

People with disabilities make up an estimated one billion, or 15 percent, of the world’s population. About 80 percent are of working age. However, many of them face barriers to education, access to health care and are more likely to be unemployed [34]. Disability management is an indispensable tool to support workers’ integration and retention. A disability management approach that employs a biopsychosocial approach should be combined with new technologies such as digitalization for skilling or re-skilling of workers; and OHSs may also use a patient-centered approach to bolster workers’ health and well-being.

OHS are, however, are still scarce and unevenly distributed across the world, as they may be affected by socio-economic inequities. COVID-19 has increased health inequities that have existed in our society for decades. Level of education, poverty, poor housing conditions, low household income, speaking in a language other than the national language in a country, and living in overcrowded households were found to be risk factors of COVID-19 incidence/infection, death, and confirmed diagnosis, and many essential workers are at high risk for COVID-19 infection as they have one or more of these risk factors [35].

COVID-19, economic crisis and new global health challenges caused by climate change could require new adjustments in healthcare systems of both high and medium-low income countries. COVID-19 crisis has affected all aspects of everyday life and work, and heavily impacted the global economy. However, the COVID-19 lesson could even indicate policymakers the right strategies to address the current global climate emergency, by tackling inequity, costs and solidarity through a global and coordinated strategy [36,37].

Responding to COVID-19 and future global challenges is not only necessary, but also timely [38]. Therefore, further research and guidelines from policymakers are warranted, even to reduce gaps and heterogeneity increasingly in assistance to workers affected by post COVID-19 syndrome.

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