Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
The potential role of nutrition in mitigating the psychological impact of COVID-19 in healthcare workers

Silvia Irene Maffoni a, Aliki Kalmpourtzidou b,*, Hellas Cena a,b

a Clinical Nutrition and Dietsetics Service, Unit of Internal Medicine and Endocrinology, ICS Maugeri IRCCS, Pavia, Italy
b Laboratory of Dietsetics and Clinical Nutrition, Department of Public Health, Experimental and Forensic Medicine, University of Pavia, Pavia, Italy

ARTICLE INFO

Keywords:
Nutrition
Healthcare workers
Covid-19
Keywords:
Stress
Nutrition
Healthcare workers
Covid-19

ABSTRACT

Healthcare professionals are exposed to several stress factors, especially during health emergency situations like Covid-19. Psychological distress in the COVID-19 era adversely affects both healthcare professionals' mental and physical health, decreasing performance and efficiency at work. Nevertheless, no sufficient emphasis has been placed so far on the role of nutrition against stress and anxiety among healthcare professionals. Consequently, worksite health promotion approaches and interventions are highly recommended, but also National Health Systems are praised to develop strategies and policies to satisfy nutritional requirements in health emergencies such as Covid-19 pandemic. In this brief paper, the important role of nutrition during periods of stress is highlighted, providing nutritional advice to enhance resilience in this risk group. In addition, practical lifestyle and diet tips for stress management among healthcare professionals exposed to Covid-19 are reported in this mini review.

The goal of this brief article is to highlight the important role of nutrition for mental health of COVID-19 frontline healthcare workers (HCW) and to provide nutritional advice for stress and mental burden prevention in this risk group (Table 1). Only in Italy, more than 10,000 HCW have been infected during the medical emergency between March 23 and April 9, 2020 [1]. Lifestyle and social intercourse of most HCW has changed in order to avoid the spread of infection, adopting social isolation.

The psychological impact of COVID-19 was analyzed firstly in China, and then considered in the rest of the world [1–3]. Most studies, reported a high prevalence of anxiety and depressive symptoms [1–6], and according to Barquehais et al. (2020), HCW with higher clinical responsibilities were at a higher risk for psychological distress, as well as those living in regions with higher rate of COVID-19 infection [1]. Consequently, their habitual lifestyle, including food consumption, eating behavior, water intake and stimulant substances consumption, such as caffeine underwent important changes due to stress factors at work, impacting nutritional status, immunity response, sleep and mental health [7,8]. In the general population, unhealthy food choices with consequent inadequate nutrient intake, water restriction, with consequent dehydration, as well as caffeine, energy drinks and alcohol consumption with consequent sleep disturbances, have been observed worldwide [9,10]. However to our knowledge only Zhang et al. (2020) reported an unbalanced diet specifically among COVID-19 HCW with high consumption of salt and oil in China [11].

On the other hand a very large body of evidence suggests that diet is as important to mental health as it is to physical health and nutrient-dense foods like the ones of the Mediterranean diet [12] may actually prevent mood disorders [13] as well as manage stress [14,15]. Villegas et al. (2009) reported an inverse association between Mediterranean diet and clinical depression [16]; hence a Mediterranean-style dietary pattern may preserve mental health from stress conditions, reinforcing HCW’s psychological response to COVID-19 emergency. Prolonged stress triggers inflammation and affects immune response [17]. Therefore, a high consumption of nutrients that positively impact inflammation, including monounsaturated fatty acids (MUFAs), mainly in olive oil [18], and ω-3 fatty acids, mainly in fish [19,20], provide both directly and indirectly beneficial effects to anxiety, psychological stress, mood disorders as well as improvement of related symptoms [15,21–23].

Additionally, evidence supports that intake of certain types of micronutrients, including vitamin B complex [24], folate [25], zinc [26,27], magnesium [27,28], selenium [27] positively influence mood status and mental health promoting stress prevention.

Greater consumption of specific food groups and limited intake of...
dehydration as a consequence of profuse sweating, due also to hospitals without added sugars, tea, salty broths and fruits and vegetable with high-water concentration. Avoidance of high coffee and energy drinks excessive consumption, not exceeding 400 mg of caffeine per day, equivalent to no more than 4–5 cups of coffee per day [45], substituting them with naturally caffeine-free beverages (infusions or fresh juices and smoothies) or decaffeinated drinks. Additionally, according to National Sleep Foundation recommendations, adults from 18 to 64 years old should sleep from 7 to 9 h per day [46].

Finally, healthy eating behavior should be facilitated by workplace environment. National Health Systems should consider workforce needs and demands and develop strategies and policies to satisfy also dietary needs in health emergencies such as Covid-19 pandemic. Worksite health promotion approaches and interventions have been recommended internationally by health organizations and researchers as an effective way to better manage mental health, stress and nutrition during health emergencies [47]. HCW should be given available time and space in the hospitals where they could eat their homemade meals, drink water and a canteen with healthy food choices. If not, there is the risk that HCW make fast and unhealthy food choices, fasting all day and/or binging once off from work to relieve stress by means of comfort foods such as fast food and snacks, energy-dense and nutrient poor foods. As a result, HCW may be unable to restore an adequate nutritional status, which is crucial to cope with continuous stress and maintain immune integrity.

### Funding

This research received no external funding.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### References

[1] M.D. Braquehais, S. Vargas-Cáceres, E. Gómez-Durán, G. Nieva, S. Valero, M. Casas, E. Broguerra, The impact of the COVID-19 pandemic on the mental health of healthcare professionals, QJM Int. J. Med. (2020), https://doi.org/10.1093/qjmed/hca207.

[2] X. Xiao, X. Zhu, S. Fu, Y. Hu, X. Li, J. Xiao, Psychological impact of healthcare workers in China during COVID-19 pneumonia epidemic: a multi-center cross-sectional survey investigation, J. Affect. Disord. 274 (2020) 405–410, https://doi.org/10.1016/j.jad.2020.05.081.

[3] M. Luo, L. Guo, M. Yu, H. Wang, 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. 291 (2020) 113190, https://doi.org/10.1016/j.psychres.2020.113190.

[4] E. Preti, V. Di Mattei, G. Perego, F. Ferrari, M. Mazzetti, P. Taranto, R. Di Pierro, F. Madeddu, R. Calati, The psychological impact of epidemic and pandemic outbreaks on healthcare workers: rapid review of the evidence, Curr. Psychiatry Rep. (2020) 22, https://doi.org/10.1007/s11920-020-01166-z.

[5] M.S. Spoorthy, Mental health problems faced by healthcare workers due to the COVID-19 pandemic - A review, Asian J. Psychiatr. 51 (2020) 102119, https://doi.org/10.1016/j.ajp.2020.102119.

[6] N. Talaei, M. Varamshah, H. Jamaati, A. Salimi, M. Attarchi, M. Kazempour Dizaji, M. Sadri, S. Hassan, B. Farzanez, F. Monjazebi, S.M. Seyyedmehd, Stress and burnout in health care workers during COVID-19 pandemic: validation of a questionnaire, Aust. J. Public Health 1 (2020), https://doi.org/10.1093/ajphw/jmz072.

[7] H. Jahrami, A.S. Bâllâhammad, M. AlGhaithi, A. Ebrahim, M.A.I. Faris, K. AlEid, Z. Saif, E. Haji, A. Dhabhi, H. Marzooq, S. Hubeil, Z. Hazan, The examination of sleep quality for frontline healthcare workers during the outbreak of COVID-19, Sleep Breath. 1 (2020), https://doi.org/10.1007/s11325-020-02155-9.

[8] L. Ferrari-Sarramib, M. Zuconi, F. Caseni, M. Salone, COVID-19 and sleep in medical staff: reflections, clinical evidences, and perspectives, Curr. Treat. Options Neurol. 22 (2020) 29, https://doi.org/10.1007/s11940-020-00642-4.

[9] L. Di Renzo, P. Gulatiere, P. Pirvai, L. Soldati, A. Attinà, G. Cinelli, G. Cinelli, C. Leggeri, G. Caparelli, L. Barrea, F. Scrobo, E. Esposito, A. De Lorenzo, Eating habits and lifestyle changes during COVID-19 lockdown: An Italian survey, J. Transl. Med. 18 (2020), https://doi.org/10.1186/s12967-020-02399-5.
