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The potential role of nutrition in mitigating the psychological impact of COVID-19 in healthcare workers

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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

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Table 1

Practical tips for diet, sleep and physical activity in stress management among frontline healthcare workers exposed to Covid-19.

Eating and lifestyle behaviours	Food for mental health
A Mediterranean-style diet (a diet rich of fruits, vegetables, wholegrain carbohydrates and cereals, dairy products, nuts, and extra virgin olive oil, a moderate consumption of eggs, poultry, red wine, fish and legumes and a low intake of saturated fat like butter, red meat and sweets)	Adequate water intake against dehydration (At least 2.5 l for man and 2 l for women, other sources of water: juices without added sugars, tea, salty broths and fruits and vegetable with high-water concentration)
Adequate sleep duration (7 to 9 h for adults from 18 to 64 years old)	Moderate caffeine consumption [45] (Avoidance of energy drinks, maximum 400 mg of caffeine per day for coffee and tea, 240 ml of tea could contain between 30 and 50 mg and 240 ml of coffee could contain between 80 and 100 mg of caffeine)
Moderate physical activity combining aerobic and muscle-strengthening activities and limitation of the time being sedentary [48]	Low alcohol consumption [49] (Preferably avoidance of alcohol consumption, up to 1 drink for women and 2 drinks for men per day)
No meals skipping	Food sources rich in MUFAs (eg. olive oil)
Homemade meals	Food sources rich in probiotics (eg. yogurt, kefir) Food sources rich in ω -3 fatty acids (eg. fatty fish) Food sources rich in micronutrients with beneficial effects on stress and mental health (eg. vitamin B complex, folate, zinc, magnesium, selenium)

unhealthy options are intrinsic to the eating habits of certain regional dietary patterns such as the Mediterranean one [29]. This is essentially a plant-based diet rich in all the nutrients reported above, aside from fibre and prebiotics, which produce favorable changes in the commensal gut microbiome and reduce host vulnerability to stress-induced disruptions [30]. Recently studies are focusing on the impact of prebiotics and probiotics on gut microbiota, stress reactivity and mood response [31]. Probiotics in particular showed good prospects in relieving stress and preventing stress-related health problems [32]. They are microorganisms that can be supplemented or contained in fortified foods as well as in fermented ones, including yogurt and kefir [33,34]. A meta-analysis by Chao et al. (2020), suggested that probiotics could even be an adjunct therapy for mood and anxiety disorders [35]. Noteworthy prolonged stress leads not only to functional nervous diseases, but also to organic conditions altering protective immune responses [36,37], increasing susceptibility to illness after exposure to infectious agents [38]. HCW during this pandemic emergency are the most exposed to stress susceptibility and should be provided with recommendations on adequate choices about food, eating behavior as well as hydration.

Aside from a healthy dietary pattern, rich in plant-based food as the Mediterranean diet, they should be advised on making healthy drink choices. According to the European Food Safety Authority (EFSA), adult men and women should consume at least 2.5 and 2 l of water, respectively [39]. In addition to the important role of hydration for physiological needs, adequate water intake seems to be important for mental health. Masento et al. (2014) suggested that water consumption may improve cognitive performance including visual attention, short term memory, reaction time and mood status [40]. Prolonged operations wearing personal protection equipment (PPE) accelerate fatigue and dehydration as a consequence of profuse sweating, due also to hospitals' high room temperature. Thus, in order for HCWs to meet the daily water recommendations they should consume water also in other forms: juices without added sugars, tea, salty broths and fruits and vegetable with high-water concentration. Avoidance of high coffee and energy drinks consumption is also suggested in order to eliminate the anxiogenic effect and eventual sleeping disorder. Caffeine increases cortisol secretion in

people undergoing mental stress [41], impairing neuroendocrine response, circadian rhythm and hence affecting cognitive functions and performance, body weight, diet quality and mood [42]. Furthermore the combination of stress and caffeine causes additive increases in Blood Pressure [43,44]. Therefore, HCW should be recommended to avoid 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.

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