



COVID-19 Pandemic Challenges for Nutrition Research

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The coronavirus disease 2019 (Covid-19) became a global health concern and dramatically affected many aspects of life on earth. The effects of COVID-19 and its preventive strategies during 2019-2020 have been studied in the fields of psychology, sociology, economy, and politics (1-4). Although the world health organization and regional health authorities responded promptly to the pandemic, but most of the recommendations especially in the prevention and treatment of the disease were based on animal studies and studies conducted on other coronavirus diseases or influenza (5). One example was the recommendation for vitamin D supplementation for prevention and treatment of COVID-19, which was suggested in a primary guideline in China (6). This recommendation was based on the findings of previous studies regarding the relationship between low serum vitamin d levels and severity and mortality of infectious respiratory diseases and preliminary observational studies that indicated low serum vitamin D among COVID-19 patients (7, 8). Findings of further observational studies also strengthened the role of vitamin D in prevention and treatment of the disease (9-11). Later on, other observational, cohort and randomized controlled trials (RCT) indicated that vitamin D has a role but this role might not be as miraculously as expected and vitamin D supplementation in COVID-19 patients might improve the condition but may not affect the disease outcome (12-14). The following nutritional recommendations suggested vitamins and minerals supplementation based on recommended dietary allowance mainly from natural sources not supplements and the treatment of vitamin deficiencies if detected in laboratory evaluations. Majority of the recent guidelines do not recommend high dose vitamin

D supplementation in COVID-19 patients as there is no sufficient evidence in this regard (15).

These findings indicate a gap of knowledge and the need for conducting studies that produce high level of evidence, including cohort studies, RCTs, and meta-analysis. Enormous number of systematic reviews and Meta analyses were conducted from 2020 and the problem in many of these reviews were conducting the study on non-COVID-19 studies as the other sources of high-level evidence were lacking. Therefore, it might be hypothesized that a vicious cycle was forming in terms of developing scientific evidence. Only 88 RCTs have been registered in the clinical trials website from the emergence of the disease till the time this editorial was prepared among which two were suspended due to adverse outcomes or changes in the blood profile of the recruited subjects, four were terminated due to adverse events, stopping public PCR testing, initiation of COVID-19 vaccination, or the unlikely beneficial findings based on previous studies (https://clinicaltrials.gov/ct2/results?term=vitamin+D&cond=COVID-19&age_v=&age=1&age=2&gndr=&type=Intr&rslt=&Search=Apply). This data indicates a high risk for publication bias, wrong hypotheses, and insufficient data regarding nutritional recommendations for prevention and treatment intervention of different levels of COVID-19 nearly three years after the emergence of the disease, which can be considered normal at the time of unprecedented events.

On the other hand, the large number of retracted papers in the pandemic might be an indicator of loosened peer review standards to disseminate knowledge and the courage of researchers in presenting their hypotheses and findings (16). However, the pandemic opened door for the

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integration of new science, data science, into medicine and health sciences and provide a good match for prompt situation assessment and decision making. Nevertheless, journal review process and peer review protocols should be updated to be effective in time of emerging health and epidemiologic events.

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