



ABSTRACT

## Nutrition for elderly individuals during the Covid-19 pandemic

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Received 25 May 2022  
Accepted 28 May 2022  
Published: 31 May 2022

Link to DOI:  
[10.25220/WNJ.V05.S3.0018](https://doi.org/10.25220/WNJ.V05.S3.0018)

**Citation:** Laksmi PW. Nutrition for elderly individuals during the Covid-19 pandemic. World Nutrition Journal. 2022 May 31, 5(S3): 28-29.



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**Website:** <http://www.worldnutrijournal.org/>

### Abstract : Nutrition Virtual Symposium 2021 - Speaker

Aging process, genetic factor, lifestyle, and disease(s) give contribution to the phenotype of robust, prefrail or frail elderly. The frailer the elderly, the more vulnerable they become to poor health outcomes. Aged patients are more likely to have adverse outcomes from Coronavirus disease-19 (COVID-19). Recovery from such disease also take a longer time compared to the younger age group.

In addition to immune senescence, inflammaging, and existing comorbidities, older people are susceptible to macro and micro-nutrient deficiencies which predispose them to infection, including COVID-19. Therefore, it is important to conduct nutritional screening and assessment as part of comprehensive geriatric assessment. Age-related changes, diseases, iatrogenic effects of medications/ medical procedures, psychological, and socio-economic factors contribute to the development of malnutrition in older patients. Furthermore, mnemonic of MEALS ON WHEELS may help identifying the cause of weight loss among elderly.

The association between nutritional status and immune function has been well established. Certain micronutrients have immunomodulatory effects, namely vitamin A, B6, folic acid, B12, C, D, and E as well as zinc, selenium, iron, and copper. It is proposed that COVID-19 susceptibility, its severity, adverse clinical outcomes, and the recovery period are affected by nutrition deficiency whereas supplementation has potential benefits as adjuvant therapy. Nevertheless, the direct evidence of micronutrients supplementation to prevent severe COVID-19 or fasten the recovery was limited.

The elderly is susceptible to vitamin D deficiency due to impaired ability of the aging skin to synthesize vitamin D, lack of outdoor activity which led to limited sun exposure, and low vitamin D intake/ poor dietary habits. Elderly with chronic liver and/ or kidney disease which impaired the metabolism of inactive vitamin D to form into 1,25(OH)<sub>2</sub> vitamin D, may also be affected.

Vitamin D is not only beneficial for musculoskeletal health, but also for modulation of innate and adaptive immunity. Vitamin D supplementation of 400–1000 IU/day for at least 12 months showed protective effect against respiratory infection by 11%.

However, the recommendation of vitamin D supplementation during pandemic does not necessarily for COVID-19 prevention, but for bone health during home isolation. Although the serum 25(OH) vitamin D was significantly lower in COVID-19 infected as compared to non-infected patients and the level of 25(OH) vitamin D serum may decrease by 40% within the first 24 hours of acute illness due to inflammation,

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decreased synthesis of vitamin D binding proteins and increased 25(OH) vitamin D renal excretion, the evidence of the association between vitamin D deficiency, vitamin D supplementation and COVID-19 infection with its adverse outcomes was still uncertain. Vitamin D deficient individuals and lower vitamin D concentration have significant association with COVID-19 infection, composite severity, and mortality, but not for pulmonary involvement, inflammation, hospitalization, length of hospital stay, and ICU admission.

Vitamin C enhances immune function through its effects as anti-inflammatory, antioxidant, and microvascular action. To date, there is lack of direct evidence to support high-dose or regular supplementation of vitamin C in well-nourished general population, in non-communicable diseases patients, and frail elderly for reducing the risk of respiratory infections. Moreover, although vitamin C deficiency is common in critically ill patients and high dose of intravenous vitamin C may reduce the inflammatory cytokine production, there were few data on the clinical outcomes of those patients.

Zinc deficiency in the elderly is also common. Zinc has immunomodulatory and anti-inflammatory actions as well as anti-viral properties. Whereas vitamin E and selenium improve immune response and have antioxidant effect. The evidence of their effects on COVID-19 were also limited.

However, every effort should be made to enhance immunity during COVID-19 pandemic. Therefore, it is essential to fulfill nutritional adequacy of macro- and micro-nutrients. Low intake, risk of malnutrition or malnourished elderly should be given nutritional supplementation including micronutrient supplementation as indicated. Nutritional support is also important for recovery period, weight loss associated acute systemic inflammation, and long COVID-19 syndrome. Though the evidence remains uncertain, micronutrients supplementations may serve as complementary therapy in the management of COVID-19 due to their potential benefits in improving immune responses and suppressing viral replication. Supplementation with higher dosage may be necessary and justify. Further high-quality clinical trials or observational studies on the effect of nutritional support in the COVID-19 prevention and management are essential and highly anticipated.

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**Keywords:** covid-19, elderly, nutrition

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