

TECHNICAL REPORT

NUTRITION RECOMMENDATIONS TO COMBAT COVID-19: A SCOPING REVIEW

PROJECT NO: NMRR-20-660-54525



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ISBN: 978-967-16048-4-7

Nutrition recommendations to combat COVID-19: A scoping review

Suggested citation:

Norsyamalina CAR, Jayvikramjit Singh MS, Munawara P, Syafinaz MS, Ahmad Ali Z, Ruhaya S. **Nutrition recommendations to combat COVID-19: A scoping review.**

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Published by Institute for Public Health, Ministry of Health, Malaysia

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ACKNOWLEDGEMENT

The authors would like to thank the Director General of Health Malaysia for his permission to publish this research technical report.

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ABSTRACT

The current pandemic situation of COVID-19 remains severe. There is no doubt that COVID-19 pandemic is affecting every aspect of our lives. Currently, the spread of inaccurate information or fake news on the internet to the public is causing the community to panic. Thus, this study aims to obtain available information on food and nutrition related to prevention and treatment of COVID-19 from various sources. A scoping review framework was used to chart the evidence on the nutrition recommendation in COVID-19 based on Preferred Method in Reporting Systematic Review and Meta-analysis extension for Scoping Reviews (PRISMA-ScR). This research technical report was categorized into three main groups: general dietary recommendations, supplementation with specific micronutrients and supplementation with mixture of micronutrients. A total of 60 articles met the inclusion criteria and were used in the review. This scoping review demonstrates that there is no miracle cure, food, or supplement that can cure or prevent COVID-19. Currently, there is no confirmed treatment or vaccine for the disease. Practicing healthy eating habits is the best nutrition recommendation during the pandemic. Hence, this review hopefully will provide evidence-based nutrition recommendations that are available on current COVID-19 treatment. We hope that the authority can inform the public and media to stop the spread of nutrition pseudoscience in the wake of the COVID-19 pandemic.

Keywords: *COVID-19, pandemic, nutrition recommendation, nutrition intervention, nutrition prevention*

1. INTRODUCTION

The current pandemic situation of COVID-19 remains severe. Currently, the World Health Organization (WHO) reported laboratory-confirmed COVID-19 cases and deaths worldwide stood at 722,202 and 33,976, respectively (1). It is important to note that these figures are likely to be underestimated since the data presented depicts laboratory-confirmed diagnoses only. At present, there are no specific antiviral drugs or vaccines against COVID-19 infection for a potential therapy for humans (2).

Most of the infected patients have developed mild symptoms such as dry cough, sore throat, and fever. Most of the cases have spontaneously resolved (3). However, some cases have developed various fatal complications including organ failure, septic shock, pulmonary edema, severe pneumonia, and Acute Respiratory Distress Syndrome that requires specialized management at intensive care units (ICU) (4). Lately, much has been discussed about the nutritional intervention for COVID-19. A lot has been discussed about the possible therapeutic effects of certain properties in food that are able to aid the treatment of COVID-19. Most of the studies and literature that are available are reviews, systematic reviews, observational studies, laboratory diagnosis, case studies, clinical trials, and general nutritional guidelines. Currently, there are no definite recommendations available in terms of medical, nutritional therapy guidelines for the treatment of COVID-19.

Public are sharing nutrition remedies that claimed to cure or prevent this virus without support from evidence-based studies. Malaysians, too, are not left out in the situation of promoting certain dishes, leaves and products that can prevent a person from being infected with COVID-19. Thus, the study aims to obtain available information on food and nutrition related to prevention and treatment of COVID-19 from various sources. We also analyze and discuss the approaches presented.

2. OBJECTIVES

2.1 To examine the source of discrepancy on medical nutrition therapy and dietary recommendation practiced by affected countries of COVID-19.

2.2 To obtain available information on food and nutrition related to prevention and treatment of COVID-19 from various sources.

3. MATERIAL AND METHODS

Scoping reviews are broad by nature and are used to delineate, to map the key concepts underpinning a field of research as well as to clarify working definitions, and the conceptual boundaries of a topic that encompass a range of interventions and outcome measures (5). This scoping review of empirical research and conceptual literature follows the framework of Arksey and O'Malley (6) which involves: (i) defining a research question, (ii) identifying and selecting relevant studies/publications, (iii) charting resulting data, (iv) interpreting, summarizing, and reporting the results. The review is published following the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) (7).

Step 1: Identifying the research question

The purpose of this review is to explore relevant evidence-based nutrition recommendations that are available on current COVID-19 treatment. It covers certain claims and fallacies on certain food, supplements, dishes, herbal remedies, and other forms of medicinal remedies that are suggested for COVID-19 treatment and prevention.

Step 2: Identifying relevant articles and selecting articles

A time frame for publications was set to focus on recent developments (from 1 January 2020 to 10 April 2020) and related to nutrition myth in COVID-19 from the countries with confirmed cases. We performed a search published scientific journals, unpublished work, grey literature as below:

- i. Electronic databases of Medline/ PubMed, Science Direct, Web of Sciences, and Scopus.
- ii. Relevant research websites such as the WHO, and Google Scholar.

- iii. Bibliographic search of reports, summaries, newsletters, and references from selected articles or bulletin from the WHO and Ministry of Health.
- iv. Other sources included information from experts in the relevant agencies, research fields from countries all over the world.

The search was conducted with MeSH terms, including Novel coronavirus, Novel coronavirus 2019, 2019 nCoV, COVID-19, Wuhan coronavirus, SARS-CoV-2, nutrition myth, nutrition therapy, nutrition intervention, nutrition remedies, dishes, leaves, product, food, diet, Traditional Chinese Medicine, immune system, and supplements.

Figure 1 outlines the search strategy. After deduplication, we screened the records to assess eligibility and analyze the full-text manuscripts. The final sample consists of 60 publications (Table 1 and Table 2). It is difficult to determine a journal because COVID-19 is a new global pandemic that has yet to confirm its discovery in nutrition. However, many online sources (unpublished) discuss the myths and misconceptions of nutrition.

We used combinations of the following subject headings: COVID-19, nutrition therapy/ recommendation/ intervention/ prevention, nutrition myths and nutrition fallacies. Consequently, the results of our search with MeSH should theoretically include all articles addressing these principles. After screening, the final sample resulting from this MeSH search (n = 29) included 31 articles that were already included in the first sample of this scoping review. A vast majority of the articles identified through the MeSH search focused on nutrition recommendations and the relevance of many articles was doubtful regarding the purpose of this scoping review. In every case, we observed that all the fields and subjects addressed by the publications identified through the Google search.

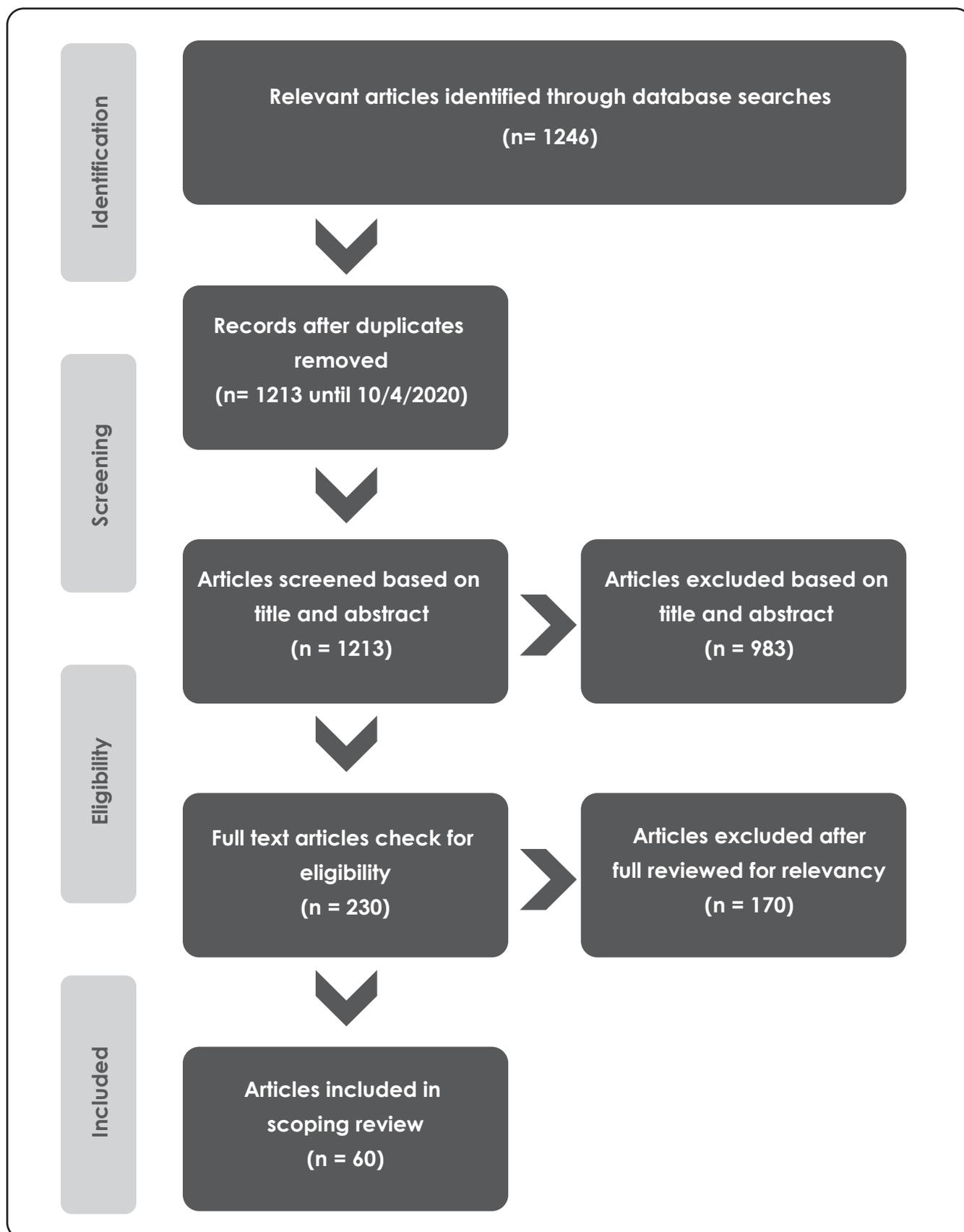


Figure 1. PRISMA-ScR flow diagram for the scoping review process selection of articles

To minimize the risk of omitting relevant sources of evidence, one researcher conducted a search of the grey literature through the internet using different combinations of search terms (8). Grey literature documents that not formally published in academic sources (e.g., peer-reviewed journals) and include information sources such as newspapers, websites, conference proceedings, and unpublished research (e.g., thesis) (8).

First, a filter was applied to limit the Google search to the region of Malaysia and the Malay and English language. Next, the first ten pages of each search's hits (representing 100 results) were reviewed, using the title and two to three lines of text underneath. This number of pages allowed the search to retrieve the most relevant hits while still being a feasible amount to review (8). Potentially relevant records were 'bookmarked' in the web browser and later transferred an Excel spreadsheet for further screening. For each search strategy, the search terms, number of results retrieved and screened, and date of the search (1 January 2020 to 10 April 2020) were recorded. The reference lists of all included sources of evidence were hand-searched by one reviewer to identify additional relevant sources.

Step 3: Charting resulting data

The articles were categorized into: (i) General dietary recommendations was a first step in charting the data, (ii) Supplementation with specific micronutrients (e.g. vitamin C, vitamin D and others vitamins), and (iii) Supplementation with mixture of micronutrients (e.g. use of TCM and specific herbs) that are said to cure and prevent COVID-19. The next stage involved screening all the publications for a second time to determine whether (or not) these issues were being addressed. We extracted the following data from each record: author(s), year of publication, type of publication, aims of study or subject of the article, study design, outcomes/conclusion, a summary of aspects addressed, and keywords

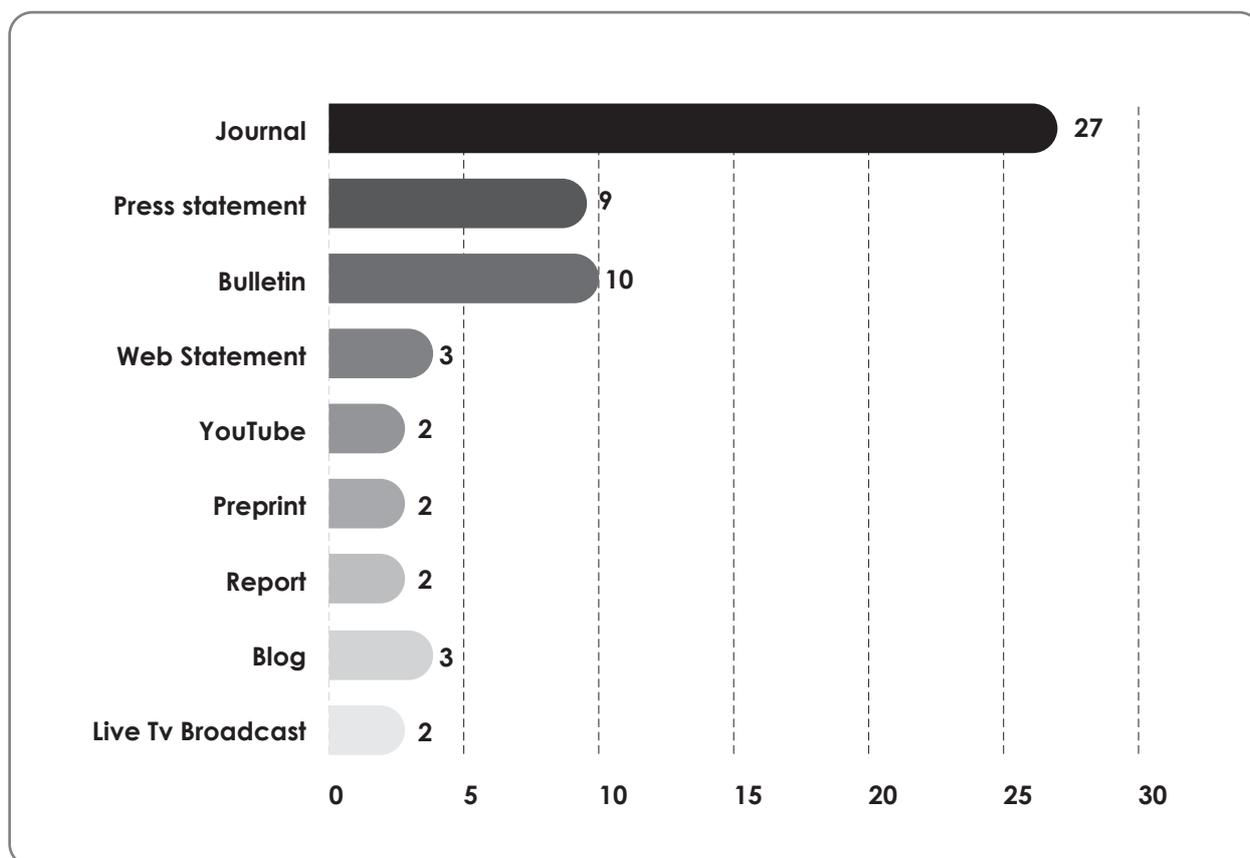


Figure 2. Types of data on nutrition recommendations and myths for COVID-19 (n = 60)

Step 4: Collating, summarizing, and reporting the result

Figure 2 summarize the types of data were discussed in each nutritional recommendation in COVID-19. Results for each issue are presented, developed, and commented in the following sub-sections.

4. RESULTS

4.1 Resource descriptions

The date of publication for included resources ranged from 1 January to 10 April, with 60 resources published during or available in 2020. For this scoping review, we have searched and analyzed available recommendations by other countries inflicted by COVID-19. Of the 60 resources varied from thirteen countries, 26.5% were designed in the United State (N = 16), 25.0% from China (N = 15), 10.0% from India (N = 6), 6.7% in Malaysia (N = 4), 6.7% from Canada (N = 4), 6.7% from the United Kingdom (N = 4), 3.3% in Switzerland (N = 2), 3.3% in Iran (N = 2), 3.3% in Italy (N = 2), 1.7% from Australia (N = 1), 1.7% in Finland (N = 1), 1.7% from Turkey (N = 1), 1.7% in South Africa (N = 1), and 1.7% from Indonesia (N = 1).

Table 1 summarizes the potential nutritional recommendations for COVID-19 infection. 60.7% of these studies were identified as review studies, 14.4% observational studies, 10.7% as laboratory diagnoses, 7.1% case studies, and 7.1% study on a clinical trial.

4.2 Evidence-based on nutrition recommendations

In this section, we provide a comprehensive review of the evidence-based on nutrition recommendation including supplementation with specific and mixture of micronutrient for interventions and prevention on COVID-19 infection that are available in our scoping review.

4.2.1 General dietary recommendations for interventions and prevention on COVID-19 infection

Eleven statements suggested eating healthy and nutritious food (9-19) during a pandemic can help our immune system to function correctly. Generally, people who eat a well-balanced diet tend to be healthier with more reliable immune systems and lower risk of chronic illnesses and infectious diseases (11). Limited access to fresh foods that occurred during quarantine or lockdown may lead to increased total energy intake and high processed foods consumption, which tends to be high in fats, sugars, and salt (12). Such changes in eating behavior related to stress-eating and quarantine situations could harm the immune system, overall physical and mental health, and the well-being of individuals, thus making more sustainable to viral infection (14).

Three studies generally emphasized consuming plenty of fruits and vegetables to boost immunity or to relieve symptoms of viral infection, which capable of fighting viruses (12-14). Instead of a good source of fiber for the gut, consuming plant-based foods helps improve bowel movement and increases intestinal "good" bacteria, which makes up to 85% of the body's immune system (12). Meanwhile, the diet that contains high animal foods deplete the body from good bacteria, promote inflammation and weaken the immune system and becomes prone to contagious (viral infection) and non-contagious diseases (cardiovascular diseases, diabetes, and cancer) (11). Nutrition Society of Malaysia (NSM) (13) and Australia Associated Press (AAP) (17) suggested increasing fluid intake as part of promoting a balanced gut microbiota and a positive bowel movement to practice healthy eating to fight COVID-19.

4.2.1.1 Medical nutrition therapy in the patient with COVID-19 disease

In total, we found three studies that included standard guidelines on Nutrition Therapy in the Patient with COVID-19 Disease Requiring ICU Care (20-22). American Society of Parenteral and Enteral Nutrition (ASPEN) has produced standardized guidance on Nutrition Therapy in the Patient with COVID-19 Disease Requiring ICU Care released on 30 March 2020. These guidelines emphasize nutrition assessment, nutrition delivery, route of nutrition delivery, nutrition recommendation, formula selection, and monitoring for the critically ill COVID-19 patients (20).

Nutrition Therapy Guidelines by Qinggang (21) are also of the guidelines that are widely used for supporting treatment for critically ill COVID-19 patients. These guidelines were produced before the ASPEN Guidelines. The recommendations are mainly focused on Nutrition Risk in Critically ill (NUTRIC) Assessment on critically ill patients. There was an interaction between mortality, nutritional intake, and the NUTRIC score. The higher NUTRIC scores are associated with increased nutrient intake, therefore reduce mortality and delaying further complications nor symptoms among critically ill COVID-19 patients.

Enteral Nutrition European Society for Clinical Nutrition and Metabolism (ESPEN) guidelines for COVID-19 proposed ten practical recommendations to provide concise guidance for the nutritional management of COVID-19. The practical advice is focused on the patients in the ICU setting or older age patients and patients with comorbidity, which are independently associated with malnutrition and its negative impact on patient survival (22).

4.2.2 Supplementation with specific micronutrients for interventions and prevention on COVID-19 infection

4.2.2.1 Vitamin C

Vitamin C in preventing and treating patients with Coronavirus has been mentioned and written widely across the world (23-25). A recent study by Taylor (23) recommended the dose for vitamin C in the consensus was 50 to 100 mg per kilogram of body weight per day. For severe and critically ill patients, up to 200 mg per kilogram of body weight per day is advised, injected intravenously. Supplementation of vitamin C either through diet or tablet was said lower in cost and a cheaper means in treating disease (24).

For treatment intervention against COVID-19, eight studies (20, 24, 26-31) suggested high or mega doses of Vitamin C has been used intravenously in critical care settings to treat patients with COVID-19. These megadose range from 70mg to more than 3000 mg/d. Patients who receive high doses of vitamin C did better compared to those receiving vitamin C in the normal doses (29). One clinical study by Cheng (32) among 50 moderates to severe COVID-19 patients in China compromised that vitamin C and other antioxidants are safe and essentials to mitigate COVID-19 associated with acute respiratory distress syndrome (ARDS). Thus, it is suggested for further and well-designed clinical studies to develop standard protocols in treating patients with COVID-19. Cheng (33) also has been actively talking about vitamin C as part of nutritional treatment in COVID-19 in his blog Cheng Integrative Health Centre Blog and other media social platforms. Two studies also reported further studies are needed to determine the mechanics and doses required for optimal vitamin C in treating COVID-19 (34-35).

Another clinical trial is a prospective randomized clinical trial of vitamin C infusion for the treatment of severe COVID-19 infected pneumonia by ZhiYong Peng of Zhongnan (36) Hospital starting February 2020 till September 2020. Hence with those findings will help to determine the efficacy and safety of vitamin C for viral pneumonia. A study by Gupta et al. (37) also claimed that vitamin C has some role in the prevention of pneumonia, but its effectiveness in COVID-19 needs more research. In brief, it is understood that none of these papers could provide concrete proof that vitamin C works against COVID-19. Further research is required to determine the exact dosage of vitamin C and the mechanism involved in treating COVID-19 using vitamin C.

4.2.2.2 Vitamin D

A total of five studies explored the effectiveness of vitamin D in fighting COVID-19 (26, 38-41). Vitamin D is also being claimed as an effective way of treating pneumonia, especially helpful in cold weather countries, as mentioned in an earlier western study (38). Vitamin D can be made in our skin, available in our diet, or derived from supplements. Humans received most of their vitamin D from sunshine exposure. Generally, people who are vitamin D deficient are those who have less exposure to sunlight (26). In his study, Andrew (41) suggested to maximize the body's anti-oxidative capacity and natural immunity in consuming vitamin D3. Starting with 5,000 IU/day for two weeks, then reduce to 2,000 International Units daily to prevent and minimize symptoms when a virus attacks the human body.

Four observational studies, and expert opinions, have expressed the importance of having adequate vitamin D in fighting COVID-19 (38-41). Former of U.S. Control Disease Centre (CDC) Chief Dr. Tom Frieden, on his opinion newsletter in Fox NewsChannel on a topic of 'Challenges U.S. faces as Covid-19 pandemic spread' did mention that coronavirus infection risk may be reduced by vitamin D (39). Grant et al. (38) in his paper also claim that a high dosage of vitamin D might be useful to treat patients with COVID-19. In brief, it is seen that further studies on vitamin D should be done in randomized controlled trials and large populations to support these claims.

4.2.2.3 Vitamins, micronutrients, and minerals

Five studies suggested specific vitamins and trace elements to treat COVID-19 such as vitamin A, B, and E and trace elements are said to aid in treatment for COVID-19 (26, 42-45). Vitamin B3 is claimed to have lung-protective aspects; therefore, it should be used when COVID-19 patients develop cough (44). These vitamins and trace elements are claimed to play a supporting role in enhancing the immune system against COVID-19 (43).

There are eight studies reported that other micronutrients and minerals such as magnesium, zinc, and selenium folic acid with furin and flavonoids have claims to improve viral infection (35, 41, 43, 45-49). Gombart et al. (45) stated that available evidence indicates that supplementation with multiple micronutrients with immune-supporting roles may modulate immune function and reduce the risk of infection. Courtenay (49) also stated that dietary supplements were critical for fighting the disease; however, further studies should be done in randomized controlled trials and large populations to support this claim.

Luke (46) in his article suggested three important point to maintain vitamin D3 such as need an excellent pre-biotic or probiotic, avoid white sugar and take zinc and selenium. Andrew (41) from Orthomolecular Medicine News Service also stated nutritional supplements are essential in fighting the COVID-19 disease. However, comprehensive hub of evidence-based and fact-checked nutrition information relating to the coronavirus pandemic essential needed to prove this claim. Meneguzzo et al. (48) also reported that citrus flavonoids help in the treatment of COVID-19. A study in Iran by Sheybani et al. (47) also found that folic acid with furin, as the safe drug should be useful in the prevention or management of COVID-19 associated respiratory disease. Nevertheless, since there are no randomized controlled clinical trials of any treatment against COVID-19, they are left to utilize therapeutic approaches based on past research.

4.2.3 Supplementation with mixture of micronutrients for interventions and prevention on COVID-19 infection

4.2.3.1 Traditional Chinese Medicines

Six studies proposed Traditional Chinese Medicine (TCM) should be used to treat COVID-19 patients (50-55). TCM is an ancient system of healing used in China for thousands of years. It is a form of health-related practice designed to prevent, treat, and/or manage illness and/or preserve the mental and physical well-being of individuals (53). A study by Ren et al. (50) stated TCM is used to treat COVID-19 patients to improve the cure rate, shorten the course of the disease, delay disease progression, and reduce the mortality rate. TCM works are not only to inhibit the virus, but might block the infection, regulate the immune response, cut off the inflammatory storm, and promote the repair of the body (50).

A case study involving four patients in China treatment with TCM showed improvement (51). Chan et al. (52) suggested that given the lack of strongly evidence-based regimens, the available data indicates that TCM could be considered as an adjunctive therapeutic option in the management of COVID-19. Chan et al. (52) suggested increasing the contribution and benefits of TCM with more research. Among these studies recommendation, TCM showed promising results, and we hope ongoing studies on TCM will give a convincing outcome to treat COVID-19 patients.

Table 1. Summaries of the included studies on the nutrition recommendations for COVID-19 (N = 46)

References	Country	Type of Publication	Purpose	Study Design	Main Results
Muscogiuri et al. (14)	Italy	Journal	To suggest nutritional recommendations during COVID-19 quarantine.	Review study	<ul style="list-style-type: none"> • It was keeping foods that are good sources of immunosupportive nutrients. • Planning times to eat, meals and portions. • Having a cut-off time for eating.
Gupta et al. (37)	India	Journal	To review on vitamin C for lung protection	Review study	<ul style="list-style-type: none"> • Vitamin C supplementation has some role in the prevention of pneumonia and its effect on COVID-19 needs evaluation.
Nutrition Society of Malaysia (13)	Malaysia	Web statement	To recommend healthy eating tips during COVID-19.	Not available	<ul style="list-style-type: none"> • Eat balanced meals. • Consume more vegetables and fruits. • Guard gut. • Adopt healthy cooking practices. • Keep physically active even during movement control order (MCO).
Luke (46)	India	Press statement	To boost immunity and prevent COVID-19.	Not available	<ul style="list-style-type: none"> • Take antiviral foods in the diet: <ul style="list-style-type: none"> - Garlic. - Ginger. - Star anise. - Coconut oil. - Resveratrol. - Vitamin C rich foods. • Take antiviral herbs in diet: <ul style="list-style-type: none"> - Oregano. - Tulsi. - Dried thyme. • Maintain vitamin D3 <ul style="list-style-type: none"> - Need an excellent pre-biotic or probiotic. - Avoid white sugar. - Take mineral (zinc and selenium).
Xu et al. (15)	China	Journal	To summarize and establish an effective treatment	Laboratory diagnosis	<ul style="list-style-type: none"> • Nutritional support and application of prebiotics or probiotics were suggested to regulate the balance of

References	Country	Type of Publication	Purpose	Study Design	Main Results
			strategy centered on "Four-Anti and Two-Balance" for clinical practice.		intestinal microbiota and reduce the risk of secondary infection due to bacterial translocation. The "Four-Anti and Two-Balance" strategy included: <ul style="list-style-type: none"> - antiviral. - anti-shock. - anti-hypoxemia. - anti-secondary infection. - maintaining of water. - micro ecological balance. - electrolyte balance. - acid-base balance.
WHO (9)	Switzerland	Web statement	To recommend nutrition advice during COVID-19 outbreak.	Not available	<ul style="list-style-type: none"> • Eat fresh and unprocessed foods daily. • Drink enough water daily. • Eat moderate amounts of fat and oil. • Eat less salt and sugar. • Avoid eating out.
UNICEF (10)	USA	Web statement	To recommend healthy eating tips during coronavirus disease.	Not available	<ul style="list-style-type: none"> • Keep up fruit and vegetable intake. • Swap in healthy dried or canned alternatives when fresh produce is not available. • Build up a stock of healthy snacks. • Limit highly processed foods. • Do cooking and eating fun and meaningful part of your family routine.
American Society for Nutrition Member Contributor (18)	USA	Bulletin	To recommend general eating guidelines and storage of food.	Not available	<ul style="list-style-type: none"> • Suggested a guideline recommendation for healthy eating and food storage.
Dietitians of Canada (16)	Canada	Bulletin	To recommend general guidelines for food preparation, hygiene, and storage.	Not available	<ul style="list-style-type: none"> • Suggested a guideline for food preparation, hygiene, and storage.

References	Country	Type of Publication	Purpose	Study Design	Main Results
Grant et al. (38)	Switzerland	Journal	To review studies on vitamin D in reducing the risk of COVID-19.	Review study	<ul style="list-style-type: none"> Observational studies and clinical trials reported vitamin D supplementation reduced the risk of influenza. Evidence supporting the role of vitamin D in reducing the risk of COVID-19 includes that the outbreak occurred in winter, a time when 25-hydroxyvitamin D [25(O.H.)D] concentrations are lowest; that the number of cases in the Southern Hemisphere near the end of summer is short. Randomized controlled trials and extensive population studies should be conducted to evaluate these recommendations.
Calder et al. (43)	United Kingdom	Journal	Optimal nutritional status well-functioning immune system- to protect against viral infections.	Review study	<ul style="list-style-type: none"> Supplementation with the micronutrients and omega-3 fatty acids is a safe, effective, and low-cost strategy to help support immune function. Vitamins (A, B6, B12, C, D, E) and folate, trace elements (zinc, iron, selenium, magnesium), and copper and Omega-3 fatty acids are essential in supporting the immune system.
Gombart et al. (45)	USA	Journal	To provide an overview of the known mechanisms of micronutrients.	Review study	<ul style="list-style-type: none"> Evidence indicates that supplementation with multiple micronutrients with immune-supporting roles may modulate immune function and reduce the risk of infection. Micronutrients with the most robust evidence for immune support are vitamin C, vitamin D, and zinc.
Andrew (24)	USA	Journal	To maximize the body's anti-oxidative capacity and natural immunity to prevent and minimize symptoms when a virus attacks the human body.	Review study	<ul style="list-style-type: none"> Vitamin C intake: 3,000 milligrams (or more) daily, in divided doses. Vitamin D3: 2,000 International Units daily. (Start with 5,000 IU/day for two weeks, then reduce to 2,000). Magnesium: 400 mg daily (in citrate, malate, chelate, or chloride form). Zinc: 20 mg daily. Selenium: 100 mcg (micrograms) daily.
Luo et al. (54)	China	Journal	To review on Chinese Medicine (CM) be sued for prevention of Corona Virus	Review study	<ul style="list-style-type: none"> The main principles of CM use were to "tonify qi" to protect from external pathogens, disperse wind and discharge heat, and resolves dampness.

References	Country	Type of Publication	Purpose	Study Design	Main Results
			Disease 2019.		<ul style="list-style-type: none"> Chinese herbal formula could be an alternative approach to prevent COVID-19 in a high-risk population. The use of CM as preventive measures for COVID-19. Most frequently used in China were: <ul style="list-style-type: none"> Radix astragalii (Huangqi) Radix glycyrrhiza (gancào) Radix saphoshnikoviae (Fanfeng) Rhizome atractylodis Macrocephalae (baizhu) Lonicerae Japonicae Flos (Jinyinhua) Fructose forsythia (Liangqiao) Brightly colored vegetables and fruits boost immunity better than most supplements. Eat plenty of fruits and vegetables (aim for ten servings per day). Include fermented vegetables or other probiotic-containing foods.
Institute for Functional Medicine (IFM) Medical Education Team (12)	USA	Report	To boost immune function and provide symptom relief during illness may help to shorten the duration of illness.	Not available	
Restrepo (11)	USA	Bulletin	<ol style="list-style-type: none"> To improve immune system plant-based foods. To increase and help the intestinal "good" bacteria, and the overall gut microbiome health. 	Not available	<ul style="list-style-type: none"> Eating organic whole plant foods with the right amounts of leafy greens and fiber-rich foods (legumes, whole grains, beans, vegetables) Avoiding animal products including (poultry, fish, pork, beef, and dairy) Adding a lactobacillus probiotic to the everyday routine.
Frieden (39)	USA	Bulletin	To review on vitamin D may be reduced by risk COVID-19 infection.	Review study	<ul style="list-style-type: none"> Vitamin D may reduce the coronavirus infection risk with these suggestions: <ul style="list-style-type: none"> Go outside for sunlight. Eat food naturally rich in vitamin D [e.g., egg yolk and fatty fish (salmon)]. Take vitamin D supplement Stay hydrated by drinking water is vital for overall health, but it does not prevent COVID-19 infection.
Australia Associated Press (AAP) FactCheck (17)	Australia	Press statement	To provide facts on COVID-19 drinking water, advise dry on evidence.	Not available	

References	Country	Type of Publication	Purpose	Study Design	Main Results
ZhiYong (36)	China	Journal	To study the clinical efficacy and safety of vitamin C for viral pneumonia through randomized controlled trials.	Clinical trial	<ul style="list-style-type: none"> Vitamin C infusion can help improve the prognosis of patients with SARI. It is necessary to study the clinical efficacy and safety of vitamin C for the clinical management of SARI through randomized controlled trials during the current epidemic of SARI.
Zhang and Liu (26)	China	Journal	To find alternative methods to control the spread of disease.	Review study	<ul style="list-style-type: none"> Nutritional interventions (Vitamin A, B, C, D, E, PUFA, Selenium, Zinc, Iron). It was proposed to verify the nutritional status of COVID-19 infected patients before the administration of general treatments. Immunize the current children's RNA-virus vaccines, including influenza vaccine for uninfected people and health care workers. Convalescent plasma should be given to COVID-19 patients if it is available. Implement all the potential interventions to control the emerging COVID-19 if the infection is uncontrollable. The nutritional status of the host, until recently, has not been considered as a contributing factor to the emergence of viral infectious diseases.
Qinggang (21)	China	Journal	To validation of the "NUTRIC" nutritional risk assessment tool in Chinese ICU patients diagnosed as COVID-19.	Observational study	<ul style="list-style-type: none"> There was an interaction between mortality, nutrient intake and the Nutrition Risk in Critically ill (NUTRIC) score suggesting that those with higher NUTRIC scores benefited the most from increasing nutritional intake
British Dietitian Association (22)	United Kingdom	Bulletin	To recommend guidelines for nutrition management for critically ill.	Not available	<ul style="list-style-type: none"> Suggested a guideline for nutrition management for critically ill.
Ren et al. (50)	China	Journal	To report effectiveness on TCM in treating the patient with COVID-19.	Case study	<ul style="list-style-type: none"> Early intervention of TCM is a crucial way to improve the cure rate, shorten the course of the disease, delay disease progression, and reduce the mortality rate.

References	Country	Type of Publication	Purpose	Study Design	Main Results
					<ul style="list-style-type: none"> TCM works to inhibit the virus, but might block the infection, regulate the immune response, cut off the inflammatory storm, and promote the repair of the body. The prevention and control measures of COVID-19 fully reflect the ideology of "preventive treatment of disease".
Wang et al. (51)	China	Journal	To report on TCM that can be used to inhibit COVID-19.	Case study	<ul style="list-style-type: none"> Two mild and two severe 2019nCoV pneumonia patients were given combined Chinese and Western medicine treatment, three of whom gained significant improvement in pneumonia associated symptoms. The remaining patient with severe pneumonia has shown signs of development by the cut-off date for data collection.
Chan et al. (52)	China	Journal	To review all currently available guidelines, medicines, cohort studies, case studies to consider TCM as an alternative for COVID-19 treatment.	Review study	<ul style="list-style-type: none"> Lack of strongly evidence-based regimens, the available data suggest that Chinese Medicine (CM) could be considered as an adjunctive therapeutic option in the management of COVID-19.
Yang et al. (53)	China	Journal	To evaluate the supportive care and nonspecific treatment (TCM) to enhance COVID-19 symptoms.	Laboratory diagnosis	<ul style="list-style-type: none"> The safety of TCM used in the treatment of emerging coronavirus infections should be carefully evaluated. It is particularly important to avoid toxicity or interfere with the efficacy of conventional therapy caused by herb-drug interaction.
Chang (55)	China	Journal	To provide an alternative in the form of TCM since no vaccine is available to treat COVID-19.	Laboratory diagnosis	<ul style="list-style-type: none"> Recommended increasing the contribution and benefits of TCM with more research.
Gage (29)	USA	Bulletin	To report on vitamin C significantly helps the body fight against COVID-19.	Not available	<ul style="list-style-type: none"> COVID-19 patients who received sixteen times vitamin C did significantly better than those who did not get vitamin C. Vitamin C helps the body fight against inflammatory overreaction the body can get from infection when it has the Coronavirus.

References	Country	Type of Publication	Purpose	Study Design	Main Results
Mongelli and Golding (30)	USA	Bulletin	To report on vitamin C massive doses in helping coronavirus patients.	Not available	<ul style="list-style-type: none"> Seriously sick coronavirus patients in New York State's hospitals are being given massive doses of vitamin C based on promising reports that it is helped people in hard-hit China.
Cheng (32)	China	Journal	To assess the treatment of 50 moderate to severe COVID-19 patients in China.	Clinical trial	<ul style="list-style-type: none"> High-dose intravenous vitamin C has been successfully used in the treatment of 50 moderate to severe COVID-19 patients in China. Vitamin C and other antioxidants are among currently available agents to mitigate COVID-19 associated acute respiratory distress syndrome (ARDS).
Cheng (33)	China	Blog	To observe the Home Treatment Plan for mild COVID-19 or common colds.	Observational study	<ul style="list-style-type: none"> Dr Cheng's Home Treatment Plan for mild COVID-19 or common colds: <ul style="list-style-type: none"> Vit C, 5,000 mg in cold water, drink at once. Vit C, 1,000 mg - 2,000 mg or more in cold water, by mouth, every waking hour until watery diarrhea. Vit D3, 5,000 IU -10,000 IU daily. Zinc 50 -100 mg daily. Omega-3 fats 3,000 mg - 4,000 mg daily. Magnesium citrate/glycinate 500 - 1,000 mg daily. Colostrum, 10,000 mg - 20,000 mg daily. Hydrogen peroxide 3%, nebulizing 10-15 min, 3-5 times daily. Low carb/ketogenic diet. Well-hydrated. Best under the supervision of a qualified integrative medicine or orthomolecular medicine practitioner.
Cheng (31)	China	Journal	To assess the treatment for mild and moderate types COVID-19.	Review study	<ul style="list-style-type: none"> Recommendation treatment for mild and moderate types of COVID-19 was heparin anticoagulation and high dose vitamin C.
Cheng (27)	China	Journal	To observe an early and high-dose Intravenous Vitamin C (IVC) in helping COVID-19 patients.	Observational study	<ul style="list-style-type: none"> Early and high-dose IVC is quite helpful in assisting COVID-19 patients.

References	Country	Type of Publication	Purpose	Study Design	Main Results
Basiri (42)	Iran	Journal	To observe on vitamin C, vitamin E, multivitamin and antioxidant drugs as a treatment and prevention for COVID-19.	Observational study	<ul style="list-style-type: none"> Using some injectable vitamins such as vitamin C and oral vitamin E and multivitamin and highly effective antioxidant drugs such as immune syrup under the supervision of doctors are useful as treatments and prevention of COVID-19 disease.
Editorial Review Board (35)	Canada	Journal	To review on effectiveness integrative Medicine, treat COVID-19.	Review study	<ul style="list-style-type: none"> Integrative Medicine is useful and practical. Supplemental vitamin C, both oral and IV, is an excellent and relatively inexpensive and straightforward treatment for both uninfected individuals at home and critically ill individuals in the hospital. Combined with an overall integrative approach to health management, vitamin C, vitamin D, zinc, and other essential vitamins and minerals can effectively prevent and treat COVID-19. However, the mechanisms and relative benefits of different doses, both oral/liposomal and IV, need further study.
Player et al. (34)	Canada	Journal	Discuss vitamin C that maybe can help to kill viruses and reduces the symptoms of COVID-19 infection.	Review study	<ul style="list-style-type: none"> Vitamin C has worked against every single virus, including influenza, pneumonia, and even poliomyelitis. Vitamin C supports to boost the immune system. Vitamin C helps to kill viruses and reduces the symptoms of COVID-19 infection.
Hemilä and Chalker (25)	Finland	Journal	To determine vitamin C treat SARS and Coronavirus.	Review study	<ul style="list-style-type: none"> Vitamin C may show nonspecific effects on severe viral respiratory tract infections. The possibility that vitamin C affects severe viral respiratory tract infections would seem to further study, especially considering the recent pandemic.
Taylor (23)	USA	Report	Shanghai Medical Association recommends high-dose vitamin C for the treatment of COVID-19.	Not available	<ul style="list-style-type: none"> The dose vitamin C recommended in the consensus is 50 to 100 mg per kilogram of body weight per day. For severe and critically ill patients, up to 200 mg per kilogram of body weight per day is advised, injected intravenously.
Erol (28)	Turkey	Journal	Discuss on intravenous	Not available	<ul style="list-style-type: none"> Intravenous (IV) high-dose vitamin C treatment has

References	Country	Type of Publication	Purpose	Study Design	Main Results
			high-dose vitamin C may be the treatment of choice in the early stages of COVID-19.		significant benefits in the treatment of sepsis and septic shock.
Sheybani et al. (47)	Iran	Preprint	Folic acid may help to prevent respiratory symptoms associated with COVID-19.	Not available	<ul style="list-style-type: none"> Folic acid with furin, as the safe drug should be useful in the prevention or management of COVID-19 associated respiratory disease.
Meneguzzo et al. (48)	Italy	Preprint	Citrus flavonoids may contribute to inhibit viral infection and replication.	Not available	<ul style="list-style-type: none"> Citrus flavonoids help in the treatment of COVID-19. But since there are no randomized controlled clinical trials of any treatment against COVID-19, they are left to utilize therapeutic approaches based on past research.
Robert (20)	USA	Journal	To recommend nutrition intervention in ICU settings.	Review study	<ul style="list-style-type: none"> Nutrition recommendations are evidence-based in ICU settings.
Shi et al. (44)	China	Journal	To report on vitamin B3 for lung protection.	Review study	<ul style="list-style-type: none"> Vitamin B3 for lung protection should be useful in the prevention or management of COVID-19. Requires future research to determine the effectiveness of vitamin B3 against COVID-19.
Andrew (41)	USA	Journal	Suggestion on nutritional treatment for COVID-19 from previous experience treatment during Flu pandemic 1919-1920, Swine Flu 1970's, Bird Flu, SARS.	Review study	<ul style="list-style-type: none"> Vitamin C best to build the immune system. Magnesium is very cheap and highly beneficial to treat a viral infection. Vitamin D3 was also effective in treating pneumonia. Zinc is a powerful antioxidant and effective in fighting infections for the body. Selenium is an essential and vital antioxidant. B Co and vitamin A, a convenient and economically multivitamin.
Adham (19)	Malaysia	Live TV Broadcast	Claimed that drinking warm water could prevent COVID-19 infections.	Not available	<ul style="list-style-type: none"> Maintaining hydration (drinking water content) with drinking water is vital for overall health; it does not prevent coronavirus infection. COVID-19 has spread to countries with both hot and humid climates, as well as cold and dry. This means that COVID-19 can survive in hot and humid

References	Country	Type of Publication	Purpose	Study Design	Main Results
Courtenay (48)	South Africa	Blog	Claimed that nutritional supplements were essential in fighting the COVID-19 disease.	Not available	<p>climates.</p> <ul style="list-style-type: none"> • Dietary supplements are critical for fighting the disease; however, further studies should be done in randomized controlled trials and large populations to support this claim. • They hypothesize vitamins and supplements that could reduce the risk and severity of COVID-19 because of their benefits, which seen in another viral or respiratory disease.

4.2.3.2 Herbs

Table 2 shows the eight types of herbs and other micronutrients swirling around on the internet claimed to cure or prevent COVID-19. Some herbs have several pharmacological activities such as antibacterial, antiviral, anti-inflammatory, anticancer, cardiovascular, and immunomodulatory properties that play a role in treating nausea, dysentery, heartburn, flatulence, diarrhea, loss of appetite, infections, cough, and bronchitis but there is no single herb that shows healing or can prevent COVID-19.

Table 2. Summaries of the included studies on the herbs and other micronutrients recommendation to prevent and cure COVID-19 infection (N = 8)

References	Type of food	Myth and Fallacies	Facts (quoted from articles)
Salome (56)	Turmeric	Turmeric can prevent a person from being infected with COVID-19.	Turmeric has been used against Alzheimer's disease, arthritis, diabetes, ulcer, cancer, hypertension, and high blood cholesterol. It has anti-inflammatory, anti-mutagenic, antibacterial, antifungal, anti-protozoal, antiviral, anti-fibrotic, and antivenom properties (57). Turmeric's effects on health are generally centered upon an orange-yellow colored, lipophilic polyphenol substance called "curcumin," which is acquired from the rhizomes of the herb (58).
TimePass Machi (59)	Garlic	There is a claim of a healing effect from COVID-19 infection after eating garlic.	Fresh garlic contains vitamins, minerals, and trace elements that are beneficial for human health. Garlic contains essential oil and has several pharmacological activities such as antibacterial, antiviral, anti-inflammatory, anticancer, cardiovascular, and immunomodulatory properties (60). Garlic has been used to treat colds, hay fever, coughs, asthma, abdominal discomforts, etc. Modern herbalists and doctors have been using garlic oil as an ear drop to heal the pain of ear infection (61). Garlic has some antimicrobial properties and claim of healing from COVID-19 infection; however, no evidence to support the claim (62).

References	Type of food	Myth and Fallacies	Facts (quoted from articles)
Morimoto (63)	Ginger	Ginger boosting the immune system against COVID-19.	Ginger boosting the immune system against viral. It has antioxidant, antibacterial, anti-inflammatory, antithrombotic, and antimicrobial properties. Ginger is used as a spice and medicine for treating nausea, dysentery, heartburn, flatulence, diarrhea, loss of appetite, infections, cough, and bronchitis (60).
Bruno (64)	Elderberry	Black elderberry offers a degree of protection against COVID-19.	The level of antibodies was higher in patients receiving the black elderberry extract versus those receiving the placebo, indicating an enhanced defense response in patients infected with the flu virus during an epidemic in Southern Israel. Black elderberries extract effectively treated and helped relieve symptoms of influenza when taken in doses of 175 mg four times daily (65).
Suraya (66)	Neem leaves	Neem leaves are said to cure COVID-19 patients by drinking boiled water soaked in these leaves. Claims of people being tested negative after drinking neem leave the water.	Neem leaves have been used by Indians and Malays due to their anti-inflammatory properties to cure measles, chickenpox, and many other diseases (67). No evidence retrieved on the effectiveness of neem-based products. Overconsumption of neem-based tea or drinks may cause new-onset of G6PD deficiency which can lead to haemolytic anaemia (68).
Chhetri (69)	Tea	Three chemical compounds which are methylxanthine, theobromine, and theophylline that can help cure the COVID-19 disease if a person has an average immune system.	Methylxanthines, theophyllines are used in the treatment of airways obstruction, which is caused by health conditions such as asthma, chronic bronchitis (70).

References	Type of food	Myth and Fallacies	Facts (quoted from articles)
AFP India (71)	Bitter gourd juice	Taking bitter gourd juice will cure COVID-19 within two hours of its consumption.	Bitter gourd is a green vegetable often used in traditional medicine across Asia. A report in India has recommended that the juice of bitter gourd, a vegetable commonly used in traditional medicine, is an effective treatment for the COVID-19 (72). It was ethical to offer unproven interventions with yet unknown efficacy and adverse effects as potential treatment or prevention, keeping in view no vaccine or antiviral were available.
Luke (46)	Star anise	Taking star anise with warm water and added it to teas like green tea or black tea to the built-up immune system against COVID-19.	Pharmacologically relevant attributes of star anise are its shikimic acid content, which is an ingredient in Tamiflu, a popular medication for the treatment of influenza (73).

4.2.3.3 Others food

Table 3 shows a comprehensive hub of evidence-based and fact-checked (quoted from articles) nutrition information on the six of others food likelihood being able to reduce risk to COVID-19.

Table 3. Summaries of the included studies on the other food recommendation to prevent and cure COVID-19 infection (N = 6)

References	Type of food	Myth and Fallacies	Facts (quoted from articles)
Azizah (74)	<i>Ikan senggang</i> (Malay dish; fish cooked in clear broth)	<i>Ikan senggang</i> dish might potentially stop COVID-19 because it contains microbe fighting ingredients such as galangal, turmeric, ginger, and garlic, which can kill microbes.	The galangal, turmeric, ginger, and garlic are a healthy food that can bring health benefits as part of a balanced diet; no evidence to support claims (62).
Yasinta and Rosiana (75)	Alkaline food (e.g. lemon, lime, orange, garlic, mango, pineapple)	Alkaline foods will cure COVID-19 infection. The pH value of the novel Coronavirus ranges between 5.5 and 8.5, and thus, one should consume alkaline food that is above the pH level of the virus to prevent its spread.	The human body's acid-base balance and stays between 7.35 and 7.45. If it becomes too acid or alkaline, that could be life-threatening, and it generally is an indication of a severe health problem, not the underlying cause (76). Viruses do not have pH values. The relation between alkaline foods and the novel Coronavirus is baseless (77).
Langer (78)	Colloidal silver	Colloidal silver is proven to cure COVID-19 disease.	Colloidal silver solutions did not show any antimicrobial effect in vitro on the microorganisms, claims of colloidal silver's antimicrobial potency are misleading, and there is no place for it as an antiseptic (79).
Turak (80)	Sesame oil	Sesame oil able to fend off the COVID-19 disease.	Sesame oil does not kill the Coronavirus. Some chemical disinfectants can ruin the new virus on surfaces, including bleach/chlorine-based disinfectants, those with

References	Type of food	Myth and Fallacies	Facts (quoted from articles)
Chilhavy (82)	Coconut oil	Coconut oil destroying viruses, including COVID-19.	75 per cent ethanol, peracetic acid, and chloroform. But those chemicals, it said, have "little or no" impact on the virus and can even cause harm if they encounter skin or a person's nose (81). Coconut oil consists mainly of medium-chain saturated fatty acids. The biological properties have been widely explored and investigated due to their antimicrobial potentials. The large concentration of medium-chain fatty acids, including lauric acid and its monoglyceride, monolaurin Virgin Coconut Oil (VCO) effective in their mode of actions against pathogenic microorganisms. VCO contains phytosterols that can provide anti-inflammatory, analgesic, and antipyretic effects. Lauric acid and caprylic acid is also present in it are essential for boosting the immune system against viral (83).
Animals Asia Foundation (84)	Bear bile	Bear bile, as an active ingredient, is being used as a treatment for cases of COVID-19.	Bear bile contains the bile acid ursodeoxycholic acid or UDCA. Synthetic UDCA has been produced and used across the world for decades to treat a variety of medical issues. Bear bile has been used to successfully treat respiratory conditions like pneumonia and similar illnesses to COVID-19 for several years with success. There is no evidence to support the claim (85).

5. DISCUSSION

This report is the first scoping review that aimed to synthesize the research-based analysis of available nutrition recommendations to combat COVID-19. By having a summary of the literature in this review, health professionals should be able to review current evidence and play their part to promote healthy eating among the population to prevent or reduce the severity of the disease.

5.1 General nutrition advice by various professional bodies and government agencies in strengthening immunity to combat COVID-19

Following the literature and practice searches, most of the dietitian association's societies around the world (13, 16, 18, 22) have emphasized on healthy eating habits and general guidelines on food preparation and storing. American, Canada, and Australia Dietetics Association (16, 18) has pointed out that there is no specific food that can cure and prevent COVID-19 infection. These guidelines also specified on good hygiene practices throughout quarantine and lockdown periods. These associations have made no specific claims or unique products about COVID-19. WHO (65) and UNICEF (10) have also come forward with general healthy eating guidelines during the lockdown and quarantine period. Food and Drugs Association (FDA) (70) has also made statements that COVID-19 is not foodborne.

Nutrition recommendations such as the American Society of Parenteral and Enteral Nutrition (ASPEN) (20) and European Society for Clinical Nutrition and Metabolism (ESPEN) (9) provided convincing evidence-based guidelines for critically ill patients. Malnutrition before and after diagnosed with COVID-19 remains the main focus of medical nutrition therapy when dealing with COVID-19 patients. Therefore, it is important to look after nutritional habits during this period, following a healthy and balanced dietary pattern that contains a high amount of minerals, antioxidants, and vitamins. Several studies reported that micronutrient-supplying fruits and vegetables can boost immune function. This happens because some of these micronutrients are antioxidants, such as vitamin E, vitamin C and beta-carotene. This pandemic has emphasized that good nutrition and a healthy life is the key to strengthening immunity. Keeping foods that are good sources of immuno-supportive nutrients, planning times for eating, meals, and portions nonetheless mostly having positive attitudes in mind, could be helpful in addressing the negative health effects of quarantine. Although eating a well-balanced diet can help to ensure the normal functioning of the immune system, no specific nutrient, food, or supplement is going to "boost" it beyond the average level. Therefore, prevention and minimizing the symptoms are more accessible than to treat during severe illness phases.

5.2 Importance of the micronutrient supplementations, TCM, specific herbs and others food to fight against viral infection with prominence on COVID-19

Based on our reviews, there were some convincing claims in vitamin C. High dose IVC, has been used in China to help improve lung function in people with COVID-19. However, it is essential to note that vitamin C is not yet a standard part of the treatment plan for COVID-19. More research is further warranted in these areas of interest. There is no evidence to support the use of oral vitamin C supplements for COVID-19. Hunt et al. (86) conducted a double-blind trial among elderly patients with severe respiratory infections (bronchitis and bronchopneumonia) showed that moderate vitamin C supplementation improves clinical progress, especially among severely ill patients on admission. Eventually, vitamin C could help cure bronchopneumonia, lung abscess, and purulent bronchitis by improving as well as restoring normal pulmonary function. This treatment needs due to the attention paid, and most definitely warrants further studies.

Vitamin C may show nonspecific effects on severe viral respiratory tract infections. It also helps to kill viruses and reduces the symptoms of infection (34). Vitamin C affects severe viral respiratory tract infections and significantly found able to lower the incidence of pneumonia. The possibility that vitamin C affects severe viral respiratory tract infections would seem to further study, especially in light of the recent pandemic. Vitamin C is considered to act as an antioxidant and helps supports immune functions and protects against infection (27). Vitamin C is an essential nutrient found in fruit and vegetables that may help shorten the duration and severity of colds (12).

Meanwhile, vitamin D also have been shown to enhance immunity but no specific evidence these nutritional measures can help protect against, or even lessen the effects of COVID-19 infection. Vitamin D modulates the immune system and plays a significant role in protecting and lowers the severity of respiratory lung infections especially among children (predisposes respiratory infections) (41). Vitamin D also being claimed as an effective way of treating pneumonia, especially helpful in cold weather countries (38). Epidemiological studies, including several meta-analyses, have shown that people with low vitamin D levels have a higher risk of acute respiratory tract infection and community-acquired pneumonia (41). Vitamin E, vitamin D, and zinc enhance immunity, and require more research to be implemented in a clinical setting because there is no evidence that supplements help prevent COVID-19 as stated in most studies. However, there is no specific evidence that these nutritional measures could help protect against or even lessen the effects of COVID-19 infection. Consuming supplements can sometimes be hazardous as the ingredients the products can cause more harm than good (87). High doses are likely just excreted through your urine. Exceeding the recommended dosage for specific vitamins and minerals can be detrimental to a person's health. Drug-nutrient interaction can be fatal if a person consuming it has underlying comorbidities (88). Therefore, we recommend that all vitamins and trace elements should be taken in recommended allowances.

Micronutrients and minerals such as magnesium, zinc, and selenium that being suggested to improve viral infection (41). Magnesium plays an essential role in vitamin D metabolism, which helps convert vitamin D to its active form (89). Zinc is part of a central role in the immune system; zinc influences the immune system and alters host resistance to infection (90), and zinc-deficient persons experience increased susceptibility to a variety of pathogens. Selenium inhibits viral replication (91). Nevertheless, the Ministry of Health Malaysia (92) denies the validity of some health tips such as taking certain vitamins and foods, alkaline foods and hot drinks and sunbathing below sun to defeat the COVID-19 virus. Eating according to the Malaysian Dietary Guidelines as recommended by the Ministry of Health Malaysia ensures the intake of adequate amounts of energy, protein, micronutrients, and other food components is the key to developing good immune system.

WHO (93), has backtracked on using TCM to treat COVID-19. The safety of TCM used in the treatment of emerging coronavirus infections should be carefully evaluated. It is particularly important to avoid toxicity or interfere with the efficacy of conventional therapy caused by herb-drug interaction (53). Given lacking large-scale studies and clinical trials on the effectiveness of Traditional Chinese Medicine, we strongly suggest that more research is needed on the usage of Traditional Chinese Medicine for COVID-19 treatment. Among other recommendations, Traditional Chinese Medicine showed promising results, and we hope ongoing studies on Traditional Chinese Medicine will give a convincing outcome to treat COVID-19 patients (50-53).

Drinking hot water can kill the virus is another misunderstanding. Drinking water is essential to maintain the balance of body fluid that optimize body function. Two published articles stated that throughout this COVID-19 pandemic drinking more water has been proposed as part of avoiding the virus infections (19, 62). There was a claim by Japanese doctors who are treating the COVID-19 cases that regular sips of water can prevent the virus from entering the respiratory system. However, those have been reported as a false report by Discover Australia Associated Press (AAP) (17) as look as it was not documented in their prevention measure against COVID-19 guidelines by the Japanese Ministry of Health, Labour, and Welfare. Nevertheless, hydration is vital in general health, and more fluid intake is essential during infection. The novel coronavirus can be killed in the water at 56 degrees Celsius or higher after 30 minutes. Still, the human body cannot lift its temperature to 56 degrees Celsius (81). Xu et al. (15) in their key messages and general guidelines for nutrition management of COVID-19 recommended fluid intake based on COVID-19 symptoms that come with the progress of the infections.

There is also a misconception that there are several types of foods that can cure or treat COVID-19 patients. Among them is "Ikan Singgang dish may have ingredients to fight COVID-19". "Ikan Singgang" might potentially stop COVID-19 because it contains microbe fighting ingredients. That ingredients such as galangal, turmeric, ginger, and garlic which can be found in the dish can destroy microbes and it has been proven by previous research. Although galangal, turmeric, ginger and garlic are a healthy food that can bring health benefits as part of a balanced diet, there is no evidence from the current outbreak that eating it has protected people from the new coronavirus (93). With many people sharing unsourced 'advice' about miracle supplements and foods that prevent infection, this report produced a comprehensive focal point of evidence-based and fact-checked nutrition information relating to the coronavirus pandemic.

The available nutrition recommendations that were listed and searched in all the search engines were thoroughly studied for evidence-based literature support. Unfortunately, none could provide concrete and precise evidence to support nutritional values, properties, or cure to help treat COVID-19. This information is updating it all the time and are keen to get it into the hands of as many people as possible. It is vital that we stop spreading this misinformation. The best way to protect yourself is simple healthy habits like sleeping enough, exercising, eating well, and finding good ways to reduce stress.

6. CONCLUSION

This technical report produced a comprehensive focal point of evidence based on nutrition recommendations to combat COVID-19. In this scoping review, we highlight the essential facts in this field from our perspectives. There is much information on food and nutrition to reduce risk to COVID-19 and help patient in recovery. However, the evidence for much of these advices and the health care professional need to be cautious in recommending to the public. It is highly unlikely that a single food nutrient is able to boost immunity or to prevent COVID-19. With the COVID-19 pandemic, the best strategy is to practice healthy eating based on the principles of balance, moderation, and variety. It is especially important to understand that no supplement, diet, or other lifestyle modification other than practice social distancing, proper hygiene practices and wearing a mask can protect you from getting the virus of COVID-19.

7. REFERENCES

1. World Health Organization. WHO Health Emergency Dashboard [Internet]; 2020 [cited 2020 Apr 10]. Available from: <https://covid19.who.int/>.
2. Centres for Disease Control and Prevention. Healthcare Professionals: 486 Frequently Asked Questions and Answers [Internet]; 2019 [cited 2020 Apr 1]. Available from: <https://www.cdc.gov/coronavirus/2019-487ncov/hcp/faq.html/>.
3. Eunha S, Amna T, Wongyeong C, Yiseul L, Gerardo C. Transmission potential and severity of COVID-19 in South Korea. *Int. J. Infect. Dis.* 2020;93:339-344. doi: 10.1016/j.ijid.2020.03.031.
4. Sohrabi C, Alsafi Z, O'Neill N, Khan M, Kerwan A, Al-Jabir A, et al. World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). *Int. J. Surg.* 2020;76:71-76. doi:10.1016/j.ijsu.2020.02.034.
5. The Joanna Briggs Institute. Joanna Briggs Institute Reviewers' Manual 2015 –Methodology for JBI Scoping Reviews. University of Adelaide. The Joanna Briggs Institute, Australia, 2015.
6. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int. J. Soc. Res. Methodol.* 2005;8:19–32.
7. Tricco A, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann. Intern. Med.* 2018;169(7):467–473. doi:10.7326/M18-0850.
8. Godin K, Stapleton J, Kirkpatrick SI, Hanning RM, Leatherdale ST. Applying systematic review search methods to the grey literature: a case study examining guidelines for school-based breakfast programs in Canada. *Syst. Rev.* 2015;4:138. doi:10.1186/s13643-015-0125-0.
9. World Health Organization. Nutrition advice for adults during the COVID-19 outbreak. [Internet]. Cairo (Egypt): WHO Eastern Mediterranean; 2020 [cited 2020 Apr 2]. Available from: <http://www.emro.who.int/nutrition/nutrition-infocus/nutrition-advice-for-adults-during-the-covid-19-outbreak.html>.
10. UNICEF. Easy, affordable and healthy eating tips during the coronavirus disease (COVID-19) outbreak. 2020 [cited 2020 Apr 1]. Available from: <https://www.unicef.org/coronavirus/easy-affordable-and-healthy-eating-tips-during-coronavirus-disease-covid-19-outbreak>.

11. Restrepo M. Health status and the role of nutrition on Sars-Cov / COVID-19. Naked Food Magazine [Internet]. 2020 Mar 12 [cited 2020 Apr 1]. Available from: <https://nakedfoodmagazine.com/health-status-covid-19/>.
12. Institute for Functional Medicine (IFM) Medical Education Team. COVID-19: Functional Medicine Resources. 2020 [cited 2020 Mar 20]. Available from: ifm.org.
13. Nutrition Society of Malaysia. Fight Covid-19: Practices healthy eating. [Internet]. Putrajaya (Malaysia): Nutrition Society of Malaysia; 2020 [cited 2020 Apr 9]. Available from: <http://www.nutriweb.org.my/index.php>.
14. Muscogiuri G, Barrea L, Savastano S, Colao A. Nutritional recommendations for COVID-19 quarantine. Springer Nature Limited 2020. Eur J Clin Nutr [Internet]. 2020 [cited 2020 Mar 20]. Available from: <https://doi.org/10.1038/s41430-020-0635-2>.
15. Xu K, Cai H, Shen Y, Ni Q, Chen Y, Hu S, et al. Management of corona virus disease-19 (COVID-19): the Zhejiang experience. Med Sci [Internet]. 2020 [cited 2020 Mar 20];49(1):0. Available from: https://www.researchgate.net/publication/339509581_Management_of_corona_virus_disease-19_COVID-19_the_Zhejiang_experience.
16. Dietitians of Canada. Advice for the general public about COVID-19. [Internet]. Toronto (Canada): Dietitians of Canada; 2020 [cited 2020 Mar 17]. Available from: <https://www.dietitians.ca/News/2020/Advice-for-the-general-public-about-COVID-19>.
17. Australia Associated Press (AAP) FactCheck. COVID-19 drinking water advice dry on evidence. Australian Associated Press. [Internet]. 2020 Mar 18 [cited 2020 Mar 22]. Available from: <https://www.aap.com.au/covid-19-drinking-water-advice-dry-on-evidence/>.
18. American Society for Nutrition Member Contributor. Making health and nutrition a priority during the Coronavirus (COVID-19) pandemic. Community and Public Health Nutrition. [Internet]. Maryland (USA): ASN Member Contributor; 2020 [cited 2020 Mar 30]. Available from: <https://nutrition.org/making-health-and-nutrition-a-priority-during-the-corona-virus-covid-19-pandemic/>.
19. Adham, B. Warm water can prevent the Covid-19 virus. Narrative talk interview at RTM 1. [Internet]. 2020 Mar 22 [cited 2020 Mar 25]. Available from: <https://myklik.rtm.gov.my/>.
20. Robert M, Jayshil JP, Beth T, Malissa W, Stephen AM. Nutrition therapy in the patient with COVID-19 disease requiring ICU care. American Society of Enteral and Parenteral Nutrition (ASPEN) [Internet]. 2020 [cited 2020 Apr 28]. Available from: <https://www.sccm.org/getattachment/Disaster/Nutrition-Therapy-COVID-19-SCCM-ASPEN.pdf?lang=en-US>.

21. Qinggang GE. Identifying critically ill patients with COVID-19 who will benefit most from nutrition support therapy: validation of the NUTRIC nutritional risk assessment tool. National Library of Medicine. [Internet]. 2020 [cited 2020 Mar 20]. Available from: <https://clinicaltrials.gov/ct2/show/NCT04274322>.
22. British Dietitian Association. Critical Care Specialist Group Guidance on management of nutrition and dietetic services during the COVID-19 pandemic. [Internet]. Britain (UK): British Dietitian Association; 2020 [cited 2020 Mar 25]. Available from: <https://www.bda.uk.com/resource/critical-care-dietetics-guidance-covid-19.html>.
23. Taylor PA. Chinese Medical Team report successful treatment of coronavirus Patients with high-dose vitamin C. [Internet]. Netherlands: Dr. Rath Health Foundation; 2020 [cited 2020 Mar 22]. Available from: <https://www.dr-rath-foundation.org/2020/03/chinese-medical-team-report-successful-treatment-of-coronavirus-patients-with-high-dose-vitamin-c/>.
24. Andrew WS. Vitamin C protects against coronavirus. OMNS [Internet]. 2020 [cited 2020 Mar 17]. Available from: <http://orthomolecular.org/resources/omns/v16n04.shtml>.
25. Hemilä H, Chalker E. Vitamin C may reduce the duration of mechanical ventilation in critically ill patients: a meta-regression analysis. *J Intensive Care* [Internet]. 2020 [cited 2020 Apr 8];8:15. Available from: <https://doi.org/10.1186/s40560-020-0432-y>.
26. Zhang L, Liu Y. Potential interventions for Novel Coronavirus in China: A systematic review. *J Med Virol*. 2020;92:479–490. doi: 10.1002/jmv.25707.
27. Cheng RZ. Can early and large dose vitamin C be used in the treatment and prevention of COVID-19? *Med Drug Discov*. [Internet]. 2020 [cited 2020 Mar 28];5:100028. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7167497/>.
28. Erol A. High-dose intravenous vitamin C treatment for COVID-19. OMNS [Internet]. 2020 [cited 2020 Mar 17]. Available from: <http://orthomolecular.org/resources/omns/v16n19.shtml>.
29. Gage J. New York hospitals giving patients 16 times the daily recommended dose of vitamin C to fight Coronavirus. *Washington Examiner* [Internet]. 2020 Mar 24 [cited 2020 Apr 2]. Available from: <https://www.washingtonexaminer.com/news/new-york-hospitals-giving-patients-16-times-the-daily-recommended-dose-of-vitamin-c-to-fight-coronavirus>.

30. Mongelli L, Golding B. New York hospitals treating coronavirus patients with vitamin C. *New York Post*. 2020 Mar 24. Available from: <https://nypost.com/2020/03/24/new-york-hospitals-treating-coronavirus-patients-with-vitamin-c>.
31. Cheng RZ. Successful high-dose vitamin C treatment of patients with serious and critical COVID-19 infection. *OMNS* [Internet]. 2020 [cited 2020 Mar 23]. Available from: <http://orthomolecular.org/resources/omns/v16n18.shtml>.
32. Cheng RZ. Shanghai Expert Consensus on COVID-19 treatment, March 21, 2020. Shanghai Expert Group on Clinical Treatment of New Coronavirus Disease. *Chinese J Infect Dis*. 2020;38:Pre-published online. doi: 10.3760/cma.j.issn.1000-6680.2020.0016.
33. Cheng RZ. Dr. Cheng's Home Treatment Plan. [Internet]. Columbia (USA): Cheng Integrative Health Center; 2020 [cited 2020 Apr 8]. Available from: http://www.drwlc.com/Dr.%20Cheng_home_treatment_plan.shtml.
34. Player G, Saul AW, Downing D, Schuitemaker G. Published research and articles on vitamin C as a consideration for pneumonia, lung infections, and the novel Coronavirus (SARS-CoV-2/COVID-19). *OMNS* [Internet]. 2020 [cited 2020 Mar 26]. Available from: <http://orthomolecular.org/resources/omns/v16n20.shtml>.
35. Editorial Review Board. Rationale for vitamin C treatment of COVID-19 and other viruses. *OMNS* [Internet]. 2020 [cited 2020 Apr 1]. Available from: <http://orthomolecular.org/resources/omns/v16n21.shtml>.
36. ZhiYong P. Vitamin C infusion for the treatment of severe 2019-nCoV infected pneumonia at Zhongnan Hospital. [Internet]. Wuhan (China): U.S. National Library of Medicine; 2020 [cited 2020 Mar 18]. Available from: <https://clinicaltrials.gov/ct2/show/NCT04264533>.
37. Gupta R, Ghosh A, Singh AK, Misra A. Clinical considerations for patients with diabetes in times of COVID-19 epidemic. *Diabetes Metab. Syndr*. [Internet]. 2020 [cited 2020 Apr 2];14:211–212. Available from: <https://doi.org/10.1016/j.dsx.2020.03.002>.
38. Grant WB, Lahore H, McDonnell SL, Baggerly CA, French CB, Aliano JL, Bhattoa HP. Evidence that vitamin D supplementation could reduce risk of influenza and COVID-19 infections and deaths. *Nutrients* 2020;12:988. doi: 10.3390/nu12040988.
39. Frieden T. Former CDC Chief Dr Tom Frieden: Coronavirus infection risk may be reduced by vitamin D. *Latest News*. [Internet]. 2020 Mar 23 [cited 2020 Apr 1]. Available from: <https://www.foxnews.com/opinion/former-cdc-chief-tom-frieden-coronavirus-risk-may-be-reduced-with-vitamin-d>.

40. McCartney DM, Byrne DG. Optimization of vitamin D status for enhanced immuno-protection against Covid-19. *Ir Med J* [Internet]. 2020 [cited 2020 Apr 10];113(4):58. Available from: <https://pubmed.ncbi.nlm.nih.gov/32268051/>.
41. Andrew WS. Nutritional treatment of Coronavirus. Released at January 30, 2020. OMNS [Internet]. 2020 [cited 2020 Apr 8]. Available from: <http://www.orthomolecular.org/resources/omns/v16n06.shtml>.
42. Basiri M. Theory about treatments and morbidity prevention of Corona Virus disease (Covid-19). *J Pharm Pharmacol* 2020;8(3). doi: 10.17265/2328-2150/2020.03.004.
43. Calder PC, Carr AC, Gombart AF, Eggersdorfer M. Optimal nutritional status for a well-functioning immune system is an important factor to protect against viral infections. *Nutrients* 2020;12(4):1181. doi: 10.3390/nu12041181.
44. Shi Y, Wang Y, Shao C, Huang J, Gan J, Huang X, et al. COVID-19 infection: the perspectives on immune responses. *Cell Death Differ* 2020;27:1451–1454. doi: 10.1038/s41418-020-0530-3.
45. Gombart AF, Pierre A, Maggini S. A review of micronutrients and the immune system—working in harmony to reduce the risk of infection. *Nutrients* 2020;12(1):236. doi:10.3390/nu12010236.
46. Luke C. Antiviral foods disease coronavirus. *Indian Express*. [Internet]. 2020 Mar 16 [cited 2020 Mar 27]. Available from: <https://indianexpress.com/article/lifestyle/health/anti-viral-foods-diseases-coronavirus-6248938/>.
47. Sheybani Z, Dokoohaki MH, Negahdaripour M, Dehdashti M, Zolghadr H, Moghadami M, et al. The role of folic acid in the management of respiratory disease caused by COVID-19. *ChemRxiv*. 2020. doi: 10.26434/chemrxiv.12034980.v1.
48. Meneguzzo F, Ciriminna R, Zabini F, Pagliaro M. Accelerated production of hesperidin-rich citrus pectin from waste citrus peel for prevention and therapy of COVID-19. *Preprints* 2020; 2020030386. doi:10.20944/preprints202003.0386.v1.
49. Courtenay A. COVID-19/ Coronavirus and nutrition. South Africa: Shaw Academy; 2020 [cited 2020 Mar 30]. Available from: <https://blog.shawacademy.com/covid-19-coronavirus-and-nutrition-by-abbey-courtenay/>.
50. Ren JL, Zhang AH, Wang XJ. Traditional Chinese medicine for COVID-19 treatment. *Pharmacol Res* [Internet]. 2020 [cited 2020 Mar 20];155:104743. Available online: <https://doi.org/10.1016/j.phrs.2020.104743>.

51. Wang Z, Chen X, Lu Y, Chen F, Zhang W. Clinical characteristics and therapeutic procedure for four cases with 2019 novel coronavirus pneumonia receiving combined Chinese and Western medicine treatment. *Biosci Trends* 2020;14:64-68. doi: 10.5582/bst.2020.01030.
52. Chan KW, Wong VT, Tang SCW. COVID-19: An Update on the epidemiological, clinical, preventive and therapeutic evidence and guidelines of Integrative Chinese–Western Medicine for the management of 2019 novel Coronavirus disease. *Am J Chin Med.* 2020;48:1–26. doi: 10.1142/S0192415X20500378.
53. Yang Y, Islam MS, Wang J, Li Y, Chen X. Traditional Chinese Medicine in the treatment of patients infected with 2019-New Coronavirus (SARS-CoV-2): A review and perspective. *Int J Biol Sci* 2020;16:1708-1717. doi:10.7150/ijbs.45538.
54. Luo H, Tang Q, Shang Y, Liang S, Yang M, Robinson N, et al. Can Chinese Medicine Be Used for Prevention of Corona Virus Disease 2019 (COVID-19)? A Review of Historical Classics, Research Evidence and Current Prevention Programs. *Chin. J. Integr. Med.* 2020;26:243–250. doi: 10.1007/s11655-020-3192-6.
55. Chang QL. Traditional Chinese medicine is a resource for drug discovery against 2019 novel coronavirus (SARS-CoV-2). *J Integr Med* 2020;18:87-88. doi: 10.1016/j.joim. 2020.02.004 2095-4964.
56. Free Malaysia Today Reporter. Turmeric can prevent COVID-19. Free Malaysia Today. [Internet]. 2020 Mar 6 [cited 2020 Mar 27]. Available from: <https://www.freemalaysiatoday.com/category/bahasa/2020/03/06/lepas-kangkung-kini-kunyit-pula-dikatakan-boleh-ubati-covid-19/>.
57. Chattopadhyay I, Biswas B, Bandyopadhyay U, Banerjee RK. Turmeric and curcumin: Biological actions and medicinal applications. *Curr. Sci.* [Internet]. 2004 [cited 2020 Apr 2];87(1):44-53. Available from: https://www.researchgate.net/publication/237635269_Turmeric_and_Curcumin_Biological_actions_and_medicinal_applications.
58. Kocaadam B, Şanlıer N. Curcumin, an active component of turmeric (*Curcuma longa*), and its effects on health. *Crit Rev Food Sci Nutr.* 2017;57:2889-2895. doi: 10.1080/10408398.2015.107719.
59. TimePass Machi. Foods to the immune system against corona or COVID-19. [Internet]. 2020 Mar 18 [cited 2020 Mar 19]. Available from: <https://youtu.be/mtSIQ2iMbvo>.
60. Onyeagba R, Ugbogu OC, Okeke CU, Iroakasi O. Studies on the antimicrobial effects of garlic (*Allium sativum* L.), ginger (*Zingiber officinale* Roscoe) and lime (*Citrus aurantifolia* L.). *Afr. J. Biotechnol* [Internet]. 2004 [cited 2020 Apr 1];3(10):552-554. Available from: <http://www.academicjournals.org/AJB>.

61. Josling, P. Preventing the common cold with a garlic supplement: a double-blind, placebocontrolled survey. *Adv. Ther.* 2001;18(4):189-193. doi: 10.1007/BF02850113.
62. World Health Organization (WHO). WHO myth-busting. [Internet]: Geneva: WHO; 2020 [cited 2020 Apr 1]. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/myth-busters>.
63. Marimoto R. My family has mild Coronavirus. Here's our home Covid-19 treatment plan. [Internet]. 2020 Mar 26 [cited 2020 Mar 30]. Available from: <https://youtu.be/udprEtDVmIY>.
64. Bruno G. Nutraceutical protection against the Coronavirus. Newport Natural Health. [Internet]. 2020 Mar 1 [cited 2020 Mar 21]. Available from: <https://www.newportnaturalhealth.com/2020/03/nutraceutical-protection-against-the-coronavirus/>.
65. Zakay-Rones Z, Varsano N, Zlotnik M, Manor O, Regev L, Schlesinger M, Mumcuoğlu M. Inhibition of several strains of influenza virus in vitro and reduction of symptoms by an elderberry extract (*Sambucus nigra* L.) during an outbreak of influenza B Panama. *J Altern Complement Med.* 1995;1(4):361–369.
66. Suraya R. The alligator neem leaves covid-19. *Harian Metro.* [Internet]. 2020 Mar 26 [cited 2020 Mar 27]. Available form: <https://www.hmetro.com.my/mutakhir/2020/03/558840/daun-semambu-mampu-rawat-covid-19-metrotv>.
67. Anonymous. Neem-Growing neem, organic farming, health, animal health, environmental use, home uses, economic potential, patents, new bazaars, research papers, world neem conference. Mumbai (India): Neem foundation; 2006 [cited 2020 Apr 1]. Available from: <http://www.neemfoundation.org/>.
68. Malaysian Health Technology Assessment Section (MaHTAS). Neem Turmeric in Treatment of COVID 19. [Internet]. Putrajaya (Malaysia): Medical Development Division, Ministry of Health, Malaysia; 2020 [cited 2020 Mar 11]. Available from: https://www.moh.gov.my/moh/resources/penerbitan/mymahtas/MaHTAS%20COVID-19%20Rapid%20Evidence/Clinical%20Management/Neem_Turmeric_in_Treatment_of_Covid_19.pdf.
69. Chhetri M. Tea can be a cure to Corona virus. *The Shivalik.* [Internet]. 2020 Mar 24 [cited 2020 Mar 30]. Available from: <https://theshivalik.com/cure/>.

70. Food and Drug Association. Coronavirus/Covid19. Maryland (USA): Food and Drug Administration; 2020 [cited 2020 Mar 20]. Available from: <https://www.fda.gov/food/food-safety-during-emergencies/food-safety-and-coronavirus-disease-2019-covid-19>.
71. AFP India. Indian health authorities refute myth that juiced vegetables can cure COVID-19. [Internet]. 2020 [cited 2020 Mar 8]. Available from: <https://factcheck.afp.com/indian-health-authorities-refute-myth-juiced-vegetables-can-cure-covid-19>.
72. US-based health publication WebMD. Coronavirus: Essential Facts. [Internet]. 2020 [cited 2020 Apr 7]. Available from: <https://www.webmd.com/>.
73. Patra JK, Das G, Bose S, Banerjee S, Vishnuprasad CN, del Pilar Rodriguez-Torres M, Shin HS. Star anise (*Illicium verum*): Chemical compounds, antiviral properties, and clinical relevance. *Phytother Res*. 2020. doi: 10.1002/ptr.6614.
74. Azizah M. Ikan singgang dish can serve as a cure for COVID-19. [Internet]. Live TV Broadcast. 2020 Mar 8. Available from: <https://www.youtube.com/channel/UC2p8wkJVSjsMsRv0MjTikgA>.
75. Yasinta R, Rosiana C. Eating alkaline foods can prevent Covid-19, really? *Suara.com*. [Internet]. 2020 Apr 2 [cited 2020 Apr 5]. Available from: <https://www.suara.com/health/2020/04/02/184800/viral-di-whatsapp-makan-makanan-alkali-bisa-cegah-covid-19-benarkah>.
76. American Institute for Cancer Research. Another cancer and diet claim: The Alkaline Diet. Washington (USA): Internal Revenue Service; 2020 [cited 2020 Apr 2]. Available from: <https://www.aicr.org/resources/blog/another-cancer-and-diet-claim-the-alkaline-diet/>.
77. Chandra D. No pH value of COVID-19, experts deny its link with alkaline food. *The Quint*. [Internet]. 2020 Mar 30 [cited 2020 Apr 1]. Available from: <https://www.thequint.com/news/webqoof/no-ph-value-of-covid-19-experts-deny-its-link-with-alkaline-foods-fact-check>.
78. Langer A. Nutrition myth busters: Coronavirus cure and prevention edition. Abby Langer Nutrition. Toronto (USA): Parade; 2020 [cited 2020 Mar 22]. Available from: <https://abbylangernutrition.com/nutrition-myth-busters-coronavirus-cure-and-prevention-edition/>.
79. van Hasselt P, Gashe BA, Ahmad J. Colloidal silver as an antimicrobial agent: fact or fiction? *J. Wound Care* 2004;13:154-155. doi:10.12968/jowc.2004.13.4.26606.

80. Turak N. No, garlic won't protect you from Coronavirus: WHO pushes back on rampant misinformation. Geneva: WHO; 2020 [cited 2020 Mar 18]. Available from:<https://www.cnn.com/2020/02/04/who-pushes-back-on-coronavirus-misinformation-and-bogus-cure-claims.html>.
81. World Health Organization. Coronavirus disease (COVID-19) advice for the public: Myth busters. Geneva: WHO; 2020 [cited 2020 Mar 27]. Available from:<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/myth-busters>.
82. Chilhavy B. Coconut oil's history in destroying viruses, including coronaviruses. [Internet]. Trenches World Report. 2020 Feb 5 [cited 2020 Mar 18]. Available from:<https://fromthetrenchesworldreport.com/coconut-oils-history-in-destroying-viruses-including-coronaviruses/261624>.
83. Widhiarta KD. Virgin coconut oil for HIV- positive people. *Cord* 2016;32(1):50-57.
84. Animals Asia Foundation. Statement on bear bile usage to treat Covid-19. USA: Animal Asia Foundations; 2020 [cited 2020 Mar 29]. Available from: <https://www.animalsasia.org/us/media/news/news-archive/statement-on-bear-bile-usage-to-treat-covid-19.html>.
85. Fobar R. China promotes bear bile as coronavirus treatment, alarming wildlife advocates. Washington (USA): National Geographic Society; 2020 [cited 2020 Mar 30]. Available from:<https://www.nationalgeographic.com/animals/2020/03/chinese-government-promotes-bear-bile-as-coronavirus-covid19-treatment/>.
86. Hunt C, Chakravorty NK, Annan G, Habibzadeh N, Schorah CJ. The clinical effects of vitamin C supplementation in elderly hospitalized patients with acute respiratory infections. *Int. J. Vitam. Nutr. Res.* 1994;64:212-9.
87. Ronis MJJ, Pedersen KB, Watt J. Adverse Effects of nutraceuticals and dietary supplements. *Annu Rev Pharmacol Toxicol.* 2018;58:583-601. doi:10.1146/annurev-pharmtox-010617-052844.
88. Péter S, Navis G, deBorst MH, von Schacky C, van Orten-Luiten A, Zhernakova A, et al. Public health relevance of drug–nutrition interactions. *Eur. J.Nutr.* 2017;56(2):23–36. doi: 10.1007/s00394-017-1510-3.
89. Deng X, Song Y, Manson JE, Signorello LB, Zhang SM, Shrubsole MJ, Ness RM, Seidner DL, Dai Q. Magnesium, vitamin D status and mortality: results from U.S. National Health and Nutrition Examination Survey (NHANES) 2001 to 2006 and NHANES III. *BMC Medicine* [Internet]. 2013 [cited 2020 Mar 28];11:187. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/23981518>.

90. Shankar AH, Prasad AS. Zinc and immune function: the biological basis of altered resistance to infection. *Am J Clin Nutr.* 1998;68:447S-463S. doi: 10.1093/ajcn/68.2.447S.
91. Guillin OM, Vindry C, Ohlmann T, Chavatte L. Selenium, Selenoproteins and viral infection. *Nutrients* 2019;11(9):2101. doi:10.3390/nu11092101.
92. Ministry of Health Malaysia. Neem leaves for Covid 19 treatment. Putrajaya (Malaysia): Ministry of Health; 2020 [cited 2020 Mar 20]. Available from: <https://www.infosihat.gov.my/index.php/multimedia/infografik/item/penggunaan-daun-semambu-neem-bagi-wabak-covid-19>.
93. World Health Organization. WHO Director-General's Remarks at the Media Briefing on 2019-nCoV. Geneva: WHO; 2020 [cited 2020 Mar 27]. Available from: <https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11february-2020>.



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