

A STUDY OF NUTRITION DURING AND AFTER COVID OUTBREAK IN INDIA

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ABSTRACT

In the ongoing Corona Virus Disease 19 (COVID-19) pandemic, the most-vulnerable groups are those with pre-existing health-problems and the elderly due to a lack of their immune-system to prevent infection. Nutrition plays a vital role in maintaining the immune-system to prevent the manifestation of pathogens. This review aimed to identify and discuss the necessities of nutrients in during and after COVID-19 in developing the immunity. The consumption of certain nutrients, micronutrient and omega-3 might be tolerated upto the upper level of recommended dietary allowance (RDA) to benefit the health status. This review can assist in providing the prevention and mitigation approach to improve immunity amid the COVID-19 pandemic. The govt. should increase the flow of messages regarding the benefits of adequate nutrients in maintaining health and the immune-system. In addition, the current situation provides the best opportunity to educate the community on a healthy and balanced diet for daily life.

Keywords: Nutrition, Immune System, Micronutrient, Mineral Elements, COVID-19 Pandemic.

Introduction

The influenza pandemic has been repeatedly reported in the global history. In 1918-1920, an influenza pandemic, which is mentioned to as the Spanish-influenza pandemic, was reported to affect many-countries in the world this was then followed by the Asian and Hong Kong flu during the period of 1957- 1968 and H1N1 pandemic in 2009. In late 2019, the world was taken by surprise with the emergence of an influenza outbreak in Wuhan, Hubei-Province, China, which eventually develops into a worldwide pandemic. The disease that causes this outbreak, which is then referred to as the coronavirus disease of 2019 or COVID-19, targets human respiratory system. More than ten million people worldwide are affected by this virus. The virus official name is severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2) that belongs to the -coronavirus class. This type of virus shares the same genetic characteristics with the previous coronavirus types, namely severe acute respiratory syndrome (SARS) virus and the Middle East Respiratory Syndrome (MERS) virus. Indonesia declared the two first confirmed cases on March 2, 2020 in Depok, West Java. On March 29, 2020 the number of positive COVID-19 cases have reached almost 1,300cases in 30 provinces. DKI Jakarta, West Java, Banten, East Java, and Central Java are the five provinces with the highest number of COVID-19 cases. The SARS-Cov-2 virus-infects the respiratory tract and causes acute respiratory distress syndrome (ARDS), leading to a high amount of mortality. The World Health Organization (WHO) declared COVID-19 as a pandemic on March 12, 2020. Up to May 12, 2020, the John Hopkins Coronavirus Resource Centre has recorded 4,175,284 confirmation cases, making the disease an emerging public health-problem in all countries of the world increases the need for precautionary and curative treatment to prevent further spread of the disease. The scale of this public health-problem is overwhelming with more than 180 countries affected by the disease. Countries have started to implement policies to contain the pandemic, including encouraging people to stay home and applying physical distancing. Recent developments reveal that droplets are the medium for disease transmission and that the disease mostly manifests in people with impaired immunity systems. Droplets filled with the virus come out of the mucus environment and are expelled when someone coughs or sneezes. Preliminary findings show that the elderly and people with comorbidities are more susceptible to serious infections, which increases the risk of serious consequences.

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In China, patients with pre-existing comorbidities such as cardiovascular disease, diabetes mellitus, chronic respiratory disease, cancer, and hypertension are observed to have a high fatality rate. Malnutrition is a condition where the balance between the macro-and micronutrients required for metabolism reactions is not achieved. Lack of both types of nutrients can damage the immune system and increase the risk of disease. In animal studies, protein deficiency has been shown to reduce the response of virus-related antibodies and increase the likelihood of influenza infection. Virus manifestation, micronutrient deficiency, and pre-existing comorbidities signify disease severity and increase mortality. Factors related to malnutrition can worsen the severity of the disease, but information on disease prevention is limited from a nutritional point of view during this pandemic.

Since COVID-19 is a new disease with so many undisclosed aspects, a comprehensive approach, including prevention, is needed to reduce the impact of the outbreak. The most common diseases reported as a prompt to the development of ARDS in COVID-19 patients are hypertension, diabetes mellitus, cardiovascular diseases (CVD), coronary heart disease. Centre for Disease Prevention and Control (CDC) reported that diabetes mellitus is one of the most dangerous COVID-19 comorbidities as it stimulates CVD that causes one-third of the patients to be admitted to the ICU. Patients with severe COVID-19 and diabetes condition present severe inflammatory indicators and a higher mortality rate compared to non-diabetic patients. A study by the US Preventive Services Task Force found that the use of vitamins and minerals would help prevent chronic diseases and promote health. Obesity is a sign of excess energy stored in the body, a condition that can increase the risk of micronutrient deficiencies. People with obesity tend to have a lower vitamin D level, which plays a role in pathogenicity and inflammation.

Therefore, nutrient shortage and malnutrition will increase disease severity. Low nutritional status is likely to be related to higher oxidative stress level and inflammation status that can impair immune function. The immune system is highly-dependent on sufficient nutrient intake and diet consumed to be optimum. Sufficient energy intake to support care is also recommended by the National Health Commission of the People's Republic of China and the National Administration of Traditional Chinese Medicine to recover health-outcomes.

In light of the significant role of nutrition in the development of COVID-19, the purpose of this article is to highlight the role of nutrients in resolving the health problems associated with COVID-19 during and after the pandemic. This is a review aimed at strengthening the role of nutrition in preventing COVID-19 infections among these pandemics and emphasizing that they can improve immunity and reduce mortality in COVID-19 patients. Explain the role of nutrients. It is expected that the narrative in this paper will be able to assist the policymakers in deciding on the management of COVID-19 pandemic, especially in developing preventive programs.

Review of Literature

Dr Kavitha Fenn Arun Kumar, Madurai-based psychiatrist, says "Good nutrition helps your battered body build up its energy levels as fast as possible." And referring not just to those who have suffered the sickness, but also those who have seen adversity through the pandemic. In fact, she recommends easy-to-digest foods in repetitive and small steps because both body and mind are weak and are not in a position to work hard on the three large wide meals.

Shweta Gupta, Delhi-based nutritionist says, "To gain strength and fight weakness, it is important to build strength with proteins as they help reverse tissue damage and promote the production of T-cells, agents that promote healthy immune function."

Anjali Dange, nutritionist and founder of Starlite Nutrition and Wellness Centre, Visakhapatnam says, "Proteins are the most significant macro-nutrients that help the body rebuild and recharge. After heavy antibiotics and steroids used in treatment, vitamins improve immunity and probiotics improve intestinal bacteria."

Subhashree Ray, clinical and public health nutritionist in Mumbai, Focuses on the nutritional needs of people with co-morbidities, especially diabetes. She says, needs to be more careful with what enters her body. He added that high-fiber grains and pulses such as millet, ragi, brown rice, oatmeal, quinoa take longer to digest than simple carbs (refined grains such as flour that are often found in bread) and so on. Prevents blood sugar from rising. One of the best Bengali foods, tetor dal (bitter dal) which is made from yellow split peanut dal and bitter melon (bitter melon) is considered good.

Shikha Mahajan, Holistic Nutritionist says, "There is no health without a good diet. Most common disorders, often called lifestyle disorders or metabolic syndrome, are preventable or reversible through proper nutrition."

According to Lakshita Jain, Clinical Dietitian, “No food or supplement can stop COVID but it can help you recover faster. Think of your body as a snow removal truck. The truck will need fuel to clear the snow. Without enough fuel, the truck will not be able to do its job and the snow will continue to block the roads.”

Research Methodology

This was a retrospective review on articles related to COVID-19 and nutrition published during and after covid period. The literature search was performed using the various articles and sites. Most of the published materials related to this topic were letters to the editor, short communication, editorial, statement, journal pre-proof, and comment. Selected articles were sorted by looking at the exposure and outcome in the article and eventually seven articles were identified as suitable to the review objectives. A narrative review was then written to elaborate on the findings of these articles. This review emphasizes the benefits of good nutrition during and after the pandemic, including the role of nutrients in the immune system.

Need or Purpose of Food

Most people associate nutrition with the foods they eat. All the materials needed to make and maintain the body in proper form are usually taken in by mouth in the form of wholesome food. A good diet is merely a combination of foods which supply the materials vital to the body for its well-being. These dietary essentials are also known as nutrients. Phosphorus, copper, iodine, magnesium, manganese, potassium, sodium and other mineral elements are also essentials. They are usually present adequately in diets that supply plenty of calcium and iron.

Table 1

Dietary Essentials (Nutrients)	What the Dietary Essentials do for the Body
Protein	Builds and repairs muscles, glands blood and other tissues, furnishes materials for substances that regulate body processes. Furnishes energy for bodily activities.
Mineral Elements Calcium	Forms an important part of teeth and bones, constitutes part of muscle and nerve tissue and body-fluids.
Iron	Constitutes part of red blood cells which carry oxygen to all parts of the body.

Table 2

Vitamins	Benefits
Vitamins A	It is essential to tissues that corner and line the body. It is necessary for proper vision in dim light.
Thiamine (Vitamins B₁) Riboflavin (Vitamins B₂) Niacin (Nicotinic acid)	Each takes a specific part in the process by which foods are burned in the body.
Vitamins C (Ascorbic acid)	Its essential to health of teeth, bones, blood vessels and other tissues.
Vitamin D	Helps body to utilise calcium and phosphorus from food.
(Several other essential vitamins are probably present in sufficient quantities in diets that supply the above vitamins adequately)	
Carbohydrates	Furnish energy for work
Fats & oils	Furnish energy for work, provide fatty acids essential to health, serve to dissolve and carry vitamins such as vitamins A and D in the body.

Nutrients-Dense Post-Covid Recovery Meal

Pasty khichdi with lots of vegetables; mashed dal or rasam with rice; curd rice; paneer or soya curry with two to three soft phulkas; green leafy and seasonal vegetables; steamed fish, egg and chicken (for non-vegetarians).

• Healthy Snacks

At room temperature salad or low-fat curd, figs and dates, a tablespoon of pumpkin, chia or flax seeds, steamed peanuts or small peas, a handful of nuts (including almonds, walnuts), sweet potato licks or Seasonal fruit.

- **High Hydration**

Enough water, low-salt lassi, coconut water, buttermilk with cumin and mint, chaach, and fresh juices with seasonal fruits (without sugar), vinegar (high in fiber).

Immunity Boost: You can make a variety of health drinks at home to improve your haemoglobin level. Here are some suggestions from nutritionists: Mix a small amla, half a carrot and each apple, a tomato, a boiled beetroot and half a cup of pomegranate; dilute it with a little water according to your taste.

Kadha: In 300 ml of boiling water add 10 basil leaves, four lightly crushed black pepper, half an inch chopped ginger and a pinch of cinnamon. Divide the mixture in half and add a teaspoon of honey. A simple mixture of coriander, cumin and fennel seeds or lemon and barley water is good for general well-being.

- **Healthful-Drinks**

- **Turmeric Tea:** This is made from ground turmeric, ground cinnamon, black pepper and ginger-powder.
- **Barley Water:** This is made by boiling barley seeds with carom seeds, cardamom, black pepper, cloves and turmeric.
- **Pomegranate Smoothie:** This is made with 2 cups pomegranate or 1 cup pomegranate juice, 1 cup almond milk (plain, vanilla or cocoa flavoured) and 1 to 2 tbsp unrefined cane sugar or stevia as required

Covid-19 is Affecting Nutrition

COVID-19 is a respiratory disease and there is no evidence that food itself is a vector of transmission (ICMSF, 2020). However, measures to control the virus and its spread have had a profound effect on nutrition and the food system. At the same time, nutrition (including obesity) increases the risk of COVID-19.

Figure 1: COVID-19 Impact on Food Systems Over Time



Source: Adapted from Clapp, 2020.

Initial and ongoing uncertainty surrounding the nature of the spread of COVID-19 led to the implementation of strict lockdown and physical distancing policies in a number of countries. These measures caused a serious slowdown in economic activity and disrupted supply chains, unleashing new dynamics with cascading effects on food systems and people's nutrition.

Table 3

Nutrition Recommendations during and After Covid-19 Pandemic	
Individual	<ul style="list-style-type: none"> • Try to eat well-balanced meals, avoid irregular snacking • Choose foods rich in vitamins A, C, E, B6 and B12, Zinc and Iron such as citrus fruits, dark green leafy vegetables, nuts and dairy products.
Community	<ul style="list-style-type: none"> • Spread awareness regarding the devastating consequences of hoarding and panic-buy • Identify and support populations at risk of malnutrition within the community, especially elderly and patients with chronic diseases. • Create a structured and reliable support system to ensure availability, access and affordability of essential food commodities to all members of the community.
National	<ul style="list-style-type: none"> • Define finance and distribute a food basket of a least cost diet that addresses the health needs of the population, ensures the use of the local agricultural produce of the country and minimizes reliance on food imports. • Mobilize resources in order to finance food purchases and provisions • Support agricultural and food production industries • Closely monitor and inspect food prices and markets • Maintain high level of transparency, critical to build trust, support and compliance
Global	<ul style="list-style-type: none"> • Assure continuous flow of global trade, avoiding any trade restrictions would be beneficial to keep food and feed supplies as well as those of agriculture inputs, from worsening local conditions already strained by COVID-19 response measures • Reduce import tariffs and other restrictions on food commodities

Conclusion

Nutrition plays a major role in improving the immune response against viral infection. It is important to meet the RDA requirements for nutrition intake, even up to the upper level to optimize the defence mechanism. A continuous and extensive national nutrition program will result in enhanced health, reducing the burden of the health system. As per the study several changes were observed in the dietary habits of people which are considered to be a step towards an unhealthy life and a weak immune system. Therefore, it is advisable to consume a balanced diet, in order to maintain an effective immune system and to live a healthy life. This can be done by consumption of fruits, vegetables, and milk and milk products and reducing foods rich in fats and carbohydrates, thereby including all the nutrients important for the body. Regular physical exercise for a short duration will also help in maintaining body weight thereby reducing the risk of various chronic disorders. A healthy lifestyle remains an unexcelled way of boosting the immune system which will help in fighting all types of infection including the novel coronavirus infection. The absence of the definitive pre-emptive and treatment for COVID-19 emphasizes the importance of improving the immune system as a part of the prevention efforts and policymakers need to formulate an effective and efficient strategy for the implementation of nutrition-related health promotion.

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