


Systematic Review Article: Investigating Nutritional Needs and Its Effects on Pediatrics Outcomes in Pregnant Mothers with Covid-19 :A Systematic Review

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ABSTRACT

Introduction: One of the biggest challenges is to reduce inflammation without compromising the patient's proper immune response. In this hypothesis, science should focus on medicine and nutrition. The importance of proper nutritional status and eating habits has been widely recognized in the Covid-19 pandemic. Therefore, the present study answers the question of what is the role of nutrition on Covid-19 in pediatric. **Methodology:** The present study is a systematic review that was conducted during the third quarter of 2022 at Tabriz university of medical sciences. Therefore, at first the keywords were determined and then the search was performed among all Persian and English language databases. **Results:** The covid-19 epidemic has had a wide impact on the health, economy and livelihood of people in the past and has caused sudden changes in the way of life of people through social distance and quarantine at home with irreparable mental consequences. Optimizing public health during this epidemic requires not only the knowledge of medical and biological sciences, but also all sciences related to lifestyle, social and behavioral studies, including food habits and lifestyle. **Conclusion:** Changing the eating style and choosing a healthy diet rich in nutrients can lead to strengthening the immune system and overcoming diseases, including corona disease.

Introduction

Corona virus 2019 or covid-19 is an acute respiratory syndrome caused by acute respiratory syndrome coronavirus2 [1-3]. In December 2019, SARS-CoV-2 was apparently transmitted from animals to humans in a

seafood market and quickly spread from Wuhan, China to other parts of the world [2-4]. Due to the rapid increase in the number of cases in China and other parts of the world, on January 30, 2020, the emergency committee of the world health organization declared a global emergency [5-7]. In order to deal with the spread of this

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virus, the physical distance and quarantine of people at home strongly affected the lives of citizens and especially the eating habits and daily behaviors of people [8]. Two specific changes resulting from these stay-at-home behaviors included digital education, smart work, limited outdoor and physical activity at the gym, and food storage due to limited grocery shopping. In addition, the interruption of normal work routine due to quarantine can lead to depression and fatigue of people, which in turn is associated with receiving more energy. In addition to being tired, constantly hearing or reading about Covid-19 from the media was and is stressful. Stress leads people to overeat. Especially sugar-rich fast foods that are defined as food cravings [9-11]. These foods, mostly rich in simple carbohydrates, can reduce stress. Because they strengthen the production of serotonin with a positive effect on the mood. However, this food craving effect of carbohydrates is proportional to the glycemic index of foods that are associated with an increased risk of obesity and cardiovascular diseases that leave more dangerous complications of covid-19.

New coronavirus conditions may jeopardize maintaining a healthy and varied diet as well as regular physical activity [12-15]. For example, limited access to daily grocery shopping may reduce consumption of fresh foods, especially fruits, vegetables, and fish, in favor of highly processed foods such as canned foods, junk foods, snacks, and ready-to-eat cereals, which are usually high in fat, they are sugar and salt [16-18]. In addition, people's psychological and emotional responses to the spread of the corona virus may increase the risk of inappropriate and unhealthy eating behaviors [19]. Previous studies have proven how experiencing negative emotions can lead to overeating, so-called emotional eating. In addition, the general public may feel tired of staying at home for a long time and use overeating as a means to escape

monotony. On the other hand, due to physiological stress reactions, some people fail to receive proper meals [20].

Finally, lifestyle changes may occur as a result of sedentary behaviors, changes in smoking behavior, and sleep habits [21-23]. Due to the emerging nature of this epidemic, the scientific community is currently looking for effective vaccines as well as drugs to treat the pathology. One of the biggest challenges is to reduce inflammation without compromising the patient's proper immune response. In this hypothesis, science should focus on medicine and nutrition [24]. The importance of proper nutritional status and eating habits has been widely recognized in the Covid-19 pandemic. This is not only a matter of preventing the presence of non-communicable diseases that can lead to more severe infections, but also as a way to moderate the inflammatory state of patients [25-27]. In fact, underestimating the importance of nutrition in Covid-19 patients can significantly affect the final result of the physical condition of these patients.

Method

The current study is a systematic review that was conducted during the third quarter of 2022 at Tabriz university of medical sciences. A systematic review is a very detailed review of the available scientific works related to a specific scientific topic. To review past works, one should search, identify, select and combine previous and related researches. This should be done by a specific and repeatable method that results in minimal errors. At first, the keywords were determined, and then the search was conducted among all Persian and English language databases, and based on that, related articles were found and analyzed.

Results

Since no evidence-based treatment has yet been found for Covid-19, the appropriate selection of

nutrients through balanced meals and the use of proper hygiene practices in food selection, preparation, and storage are likely one approach to managing this disease. Considering the importance of proper nutrition and the need for available review resources, this article examines the updates of nutrition in the era of corona. To this end, the dissemination of healthy eating guidelines to health care professionals and the general public is an essential strategy. Despite the intense efforts of international nutrition organizations and other health-related communities to prepare guidelines and advice related to the epidemic disease of Covid-19, these materials have not yet been properly made available to all people. Meanwhile, the public is bombarded with a barrage of sometimes conflicting nutritional information from government officials, the supplement industry, nutritionists, health care professionals, and other well-informed or ill-informed people about how to prevent Covid-19. Therefore, a search was conducted for information obtained from several countries affected by the pandemic, as well as manuscripts identified in scientific databases. The aim was to address a key question: What nutritional advice is given to quarantined individuals during the Covid-19 pandemic?

Discuss

The world health organization recommends that vitamins, minerals, dietary fibers, proteins and antioxidants can be beneficial and can be obtained from a variety of fresh, unprocessed foods [28-30]. It is recommended to drink enough water and avoid consuming too much sugar, fat and salt [31].

Recommendations of the world health organization for nursing mothers with corona

- ✓ Babies of women with covid-19 can be breastfed [32].

- ✓ Observe respiratory hygiene while feeding.
- ✓ Wear a mask if you have symptoms.
- ✓ Wash hands before and after touching the baby.
- ✓ Clean and disinfect commonly used surfaces regularly [33].

UNICEF recommendations on food

- ✓ Continue to eat fruits and vegetables.
- ✓ Choose healthy dry or canned food options if fresh produce is unavailable.
- ✓ Canned oily fish is rich in protein, omega-3 fatty acids, and a variety of useful vitamins and minerals [34].
- ✓ Create a collection of healthy snacks.
- ✓ Limit your intake of highly processed foods.
- ✓ Make cooking and eating fun and meaningful, and spend plenty of time on nutrition [35].

UNICEF recommendations for breastfeeding mothers

The nutritional balance of the immune system is also important at any age [36-38]. In childhood, breastfeeding can provide protection against infections and respiratory diseases. Because breast milk contains antibodies, enzymes and hormones that can lead to health. Certain nutrients, such as omega-3 polyunsaturated fatty acids and probiotics, have been linked to anti-inflammatory responses and greater resistance to upper respiratory tract infections. In these days, it is useful to pay attention to the following points:

- ✓ It is better to keep breast milk as a suitable food for babies and children aged 6 to 24 months [39].
- ✓ If a mother is unable to breastfeed her child due to covid-19 infection or other complications, she should be supported to safely breastfeed her baby through substitute milk.

- ✓ Observe respiratory hygiene when using a mask.
- ✓ Wash hands before and after touching the baby.
- ✓ Clean and disinfect surfaces as usual [40].

UNICEF recommendation regarding packaged food

- ✓ Any unnecessary packaging and wrapping should be removed and placed in a closed trash can [41].
- ✓ Packages such as cans can be cleaned with a disinfectant before opening.
- ✓ Wash hands with soap and water for at least twenty seconds or use an alcohol-based hand rub.
- ✓ Unwrapped products such as fruits and vegetables should be thoroughly washed under running water [42].

Recommendations for providing food security at different levels

In the following, recommendations at different levels for the prevention and management of the Covid-19 disease are mentioned [43].

1- At the individual level:

- ✓ Try to have balanced meals.
- ✓ Avoid irregular snacks.
- ✓ 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.
- ✓ Have a healthy lifestyle with exercise, regular sleep and meditation [44].
- ✓ Avoid smoking, alcohol and drugs.
- ✓ Avoid spreading false information about nutrition and diet and covid-19 [45].

2- At the community level:

- ✓ Spread awareness about the devastating consequences of hoarding and panic buying.

- ✓ To identify and support the populations exposed to malnutrition in the society, especially the elderly and patients with chronic diseases [46].
- ✓ Establish a coherent and reliable support system to ensure the availability and affordability of basic food commodities for all members of society.

3- At the national level:

- ✓ Define, finance and distribute a food basket with a minimum diet that meets the health needs of the people. Also, ensure the use of local agricultural products of the country and minimize dependence on food imports [47].
- ✓ Resources should be mobilized in order to provide financial resources for buying and preparing food.
- ✓ Abolition of taxes on basic foods and goods should be on the agenda.
- ✓ Support agricultural and food production industries.
- ✓ Careful monitoring and inspection should be done in the field of food prices and markets.
- ✓ High transparency is very important to build trust and support [48].

4- Globally:

- ✓ Ensuring the continuous flow of global trade, avoiding any trade restrictions to prevent the worsening of local conditions already faced by communities, would be beneficial to sustain food and feed as well as agricultural production resources [49].
- ✓ Import tariffs and other restrictions on food products should be reduced.

Nutrition of obese people

It is possible that the high rates of obesity and diabetes among a small number of people at least partially reflect the observed health

differences against Covid-19 in these groups [50-52]. The data suggest that these individuals do not have easy access to healthy food choices and nutrition education, likely due to rising poverty rates and declining access to quality health care in the United States [53]. Therefore, access to healthy and fresh foods should be provided to those who normally do not have the ability to prepare them in order to eliminate chronic diseases in these communities. In fact, studies show that consuming healthy foods has a rapid anti-inflammatory effect even in the presence of obesity pathology [54-56]. Changes in these policies can also have long-term benefits in preventing diseases, including Covid-19, by increasing the effectiveness of vaccines. Because vaccines have been proven to be less effective in obese people [57-59]. In most at-risk populations, the vast majority of patients with COVID-19 are expected to recover. However, the possibility of long-term indirect consequences of this disease can also exist. In addition to potential long-term lung damage, potential effects on neurological function are also significant [60]. This is because it is known that environmental inflammatory events can induce a severe and persistent neuroinflammatory response in vulnerable individuals. Overall, it is important to consider the impact of lifestyle habits such as unhealthy diets on the susceptibility to Covid-19 and recovery. Additionally, a large number of people recovering from Covid-19 may be damaged earlier by unhealthy diets [61]. Therefore, it is recommended that people avoid eating foods rich in saturated fat and sugar and instead consume large amounts of fiber, whole grains, unsaturated fats, and antioxidants to boost immune system function [62].

Nutrition recommendations to prevent respiratory diseases and corona

The function of the body's immune system plays an important role in preventing respiratory

diseases, including the corona virus disease. The cause of the severity of the disease caused by this virus is underlying diseases such as diabetes and lung diseases, heart diseases, malnutrition and lack of proper nutrition. In people infected with SARS-CoV-2, nutrition can determine the severity of clinical complications of Covid-19. Dietary supplements containing vitamins, minerals and omega-3 fatty acids have been considered by Zhang and Leo as a treatment option for Covid-19 patients and as a preventive treatment against lung infection [63].

Lack of intake of food and vitamins such as vitamin C, A and D and weakening of the body's immune system increases the possibility of contracting diseases. Vitamin A is beneficial for the proliferation of T lymphocytes, the production of immune system reactive cytokines, and natural killer cells. Vitamins D and E regulate the immune system and fibers cause changes in the gut microbiota with a positive effect on the immune system. Zinc and selenium reduce cold symptoms. Essential fatty acids help control inflammation, infections, communication with the production of hormones and antibodies. There is evidence from animal models that shows a direct relationship between diets deficient in vitamins A, E and D and the immune response in respiratory infections and transmission caused by coronaviruses. These deficient diets have also reduced the effect of inactivated bovine coronavirus vaccines, which has made animals more susceptible to infectious diseases. For this reason, these studies highlight the importance of consuming these food sources, especially during an epidemic with specific nutritional guidelines in mind for the COVID-19 pandemic, the centers for disease control and prevention, the world health organization, and the food and agriculture organization of the United Nations have released recommendations for food safety for individuals and businesses. In addition to the above, fruits and vegetables are good sources of

water, antioxidants, and fiber, all of which play a role in controlling high blood pressure, diabetes, and weight gain. Fruits such as oranges, tangerines, lemons, kiwi and vegetables with vitamin C such as cabbage, cauliflower, turnips, green peppers and bell peppers, parsley, chives, watercress, and tomatoes are good food sources of vitamin C. Daily consumption of one orange or two tangerines provides the body with vitamin C. Dark green vegetables such as spinach, beetroot, dark lettuce, pumpkin and carrot are good sources of vitamin A. In general, in order to prevent diseases and strengthen the body's immune system, daily consumption of three units of vegetables except starchy vegetables and at least two units of fruits is recommended. The elderly, children under five years of age, pregnant mothers, and patients who take corticosteroid drugs are more at risk of infection, and it is necessary to observe the following points for prevention:

- ✓ Daily use of vegetables or salad with lime juice or fresh orange juice.
- ✓ Daily use of carrot and pumpkin in foods.
- ✓ Consuming raw onion with food due to its vitamin C content.
- ✓ Avoiding sausages and other fast foods and fatty and heavy foods.
- ✓ Using protein sources in daily food such as beans or eggs.
- ✓ Using food sources containing iron and zinc, such as legumes, as a suitable substitute for meat, milk, dairy products, green leafy vegetables and dried fruits.
- ✓ Avoid eating semi-cooked foods such as honey eggs, semi-cooked and some kebabs.
- ✓ Avoiding eating food and liquids in places that are not guaranteed in terms of hygiene.
- ✓ Using watery foods such as soup and soup with fresh lemon juice and warm liquids if you have cold symptoms.

- ✓ Daily use of wheat sprouts, mung beans and clover containing vitamin C.
- ✓ Use fruits containing seasonal antioxidants such as pomegranate, red oranges, grapefruit.
- ✓ When shopping, keep a safe distance (one to two meters) from other people.
- ✓ When sick, if possible, food should be ordered online or family members or friends should help in shopping.
- ✓ Do not touch the food on the shelf unless you are shopping.
- ✓ Going to the supermarket should be limited by planning the type of meals.
- ✓ When you cough or sneeze, cover your mouth and nose with a handkerchief or sleeve and wash your hands afterwards.
- ✓ Avoid touching your face, nose and mouth after washing your hands.
- ✓ Exercising and having enough mobility, remote virtual communication with friends and acquaintances, regular and sufficient sleep, removing stress and anxiety from yourself.

Of course, it is important to maintain balance and variety in the daily diet and to ensure adequate intake of micronutrients and protein from the daily diet. Drinking water or maintaining adequate hydration is also suggested by the researchers, but guidance on the appropriate amount of water is not provided. Evidence for a direct link between water supply status and health has already been confirmed. Water is essential for cellular homeostasis, kidney function, body temperature control, mood regulation, cognitive function, digestive system and heart function, and headache prevention. According to the European food safety authority, there is no need to disinfect food packaging as long as certain precautions are taken.

Conclusion

The Covid-19 pandemic has had a massive impact on people's health, economy, and livelihood, and has caused sudden changes in people's lifestyles through social distancing and home quarantine with irreparable mental consequences. Optimizing public health during this epidemic requires not only the knowledge of medical and biological sciences, but also all sciences related to lifestyle, social and behavioral studies, including food habits and lifestyle. Changing the eating style and choosing a healthy diet rich in nutrients can lead to strengthening the immune system and overcoming diseases, including corona disease.

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