

The Role of Healthy Diet (HD) on Covid-19 Pandemic during and after

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Abstract

Diet remains a key factor that significantly influences the outcomes of the disease. There are some factors that place one at a higher risk of morbidity from the disease, with the common ones being elderly age and coexistent comorbidities. The dietary consumption of the patient is vital since some Western Diets that are largely refined predispose one to cardio-metabolic diseases. In addition to that, the consumption of such diets largely influences the immunity of the individual, whereby it reduces the disease-fighting capability of the immune system. The health education on the patient with the condition has largely widened to encompass the healthy eating habits that one should emulate to reduce the disease severity. Further, in an attempt to promote the awareness of the importance of healthy eating, Eat Well Saskatchewan (EWS) has formulated some social media outreach to ensure that the importance of healthy eating reaches a larger population.

Keywords

Healthy Diet (HD), COVID-19 Pandemic, Saskatchewan (EWS), Immunity

1. Introduction

There are various factors that play a key role in influencing the outcome of COVID-19 disease, and diet is one of them. The diet that one consumes is vital in influencing the immunity of the individual and, in turn, influences how the body responds to the infection. A proper understanding of the role of diet is paramount when a nutritionist is offering health education to such patients. The main aim of this study is to critically review the correlation between diet and COVID-19 outcomes and how it affects the body's functioning by influencing the body's immunity.

2. Variation in COVID-19 Disease Impact in Different Populations and Role of Diet in Influencing Outcomes

Although the Covid-19 virus impacts all the populations, the underrepresented populations, the aging, and those with coexistent medical ailments are at the highest risk [1]. The increased consumption rates of Western diets (WD), or foods with excessive refined carbohydrates, sugars, and saturated fats globally, predisposes to type 2 diabetes mellitus and obesity, elevating the individual risks for Covid-19 severe mortality and morbidity. WD ingestion stimulates the innate immune structure and weakens adaptive immunity, resulting in persistent inflammation and compromised host protection against the Covid-19. Besides, the peripheral inflammation arising from Covid-19 results in neurodegenerative disorders and dementia aggravated by unhealthy foods via neuroinflammatory means. A healthy diet (HD) should be the highest priority, and people must be watchful to adopt fit eating behaviors to minimize the proneness and the chronic complications arising from the virus. It's compulsory to accomplish and preserve suitable nutritional status to combat viral infections effectively [2]. Optimal diets positively influence the immune system, and merely the sustainable survival technique in the pandemic is to fortify immunity [3].

2.1. Role of Healthy Diet in Safeguarding Patients

Further research demonstrates that a HD is vital during and after the Covid-19 disease. Healthy eating habits and HD education are practical approaches to safeguarding front-line health practitioners' psychological well-being and quality of life during the Covid-19 virus [3]. Public health should prioritize proper nutrition during the Covid-19 to boost immunity and fight the Covid-19 virus [4]. Healthy eating habits and healthy foods can safeguard the populations from an extreme inflammatory reaction to Covid-19. Moreover, it was hypothesized that the Covid-19 outbreak exhibited massive risks to the worldwide economy and health [5]. The pandemic has modified most daily behaviours encompassing eating habits, food selection, and preferences. Deficient minerals and vitamins consumption can lead to weakened immunity leading to more susceptibility to the disease. The severity of the infection depends on the diverse nutritional status of the individual affected by the disease [6]. Therefore, keen personal consideration of nutritional, dietary, and lifestyle modifications accompanied by micronutrients supplementation is essential. HDs boost the body's innate defence mechanism, enhancing the immunity system and addressing the Covid-19 virus [7].

The Covid-19 outbreak has led to massive mitigation strategies to eradicate its transmission. For most populations, everyday eating habits and diets have been modified completely. Sufficient HDs consumption could become crucial to safeguard against the severe inflammatory reaction arising from SARS-Cov-2 contamination [7]. The balanced diet inhibits the disease progression to the severity and improves the Covid-19 outcomes. The nutrients that have become significant in the Covid-19 prevention and effective management encompass selenium

and zinc minerals, vitamins E, D, and A, essential fatty acids, and fibres [8]. A HD helps in boosting the body's immune mechanism, which effectively fights against the disease. Insufficient nutrient status and consumption result in deterioration in the virus resistance and a rise in Covid-19 morbidity and mortality rates [3]. Besides, vitamin A functions to synthesise natural killer cells and immunoreactive cytokines and the multiplication of T lymphocytes [3].

2.2. Diets that Impact Immunity

In comparison, vitamins E and D control the immune system while the fibers stimulate a microbiota modification, positively impacting the immunological system [9]. Selenium and zinc perform by diminishing the symptoms and signs of colds that are noticeable during Covid-19. In comparison, the essential fatty acids assist in regulating infections, inflammation and influence antibodies and hormones synthesis [10].

2.3. Role of Various Organizations in Promoting Healthy Eating

Covid-19 onset posed numerous food-related challenges encompassing grocery modifications like capacity restrictions and decreased shopping periods [10]. Eat Well Saskatchewan (EWS) instigated a 4-months social media outreach, hashtag eatwellcovid19. The EWS campaign was steered by nutrition and dietitian learners who emphasized disseminating reports presented by the Saskatchewan community concerning healthy eating behaviors during Covid-19. The social media followers rose, exhibiting that the EWS an effective health promotion strategy amongst the population. Covid-19 crisis has enabled the embracing of the behaviors that promote healthy living. Upholding HDs play a critical role in boosting the immune system and overall health [10]. It is essential to consume various foods from every food group to guarantee sufficient vital nutrient consumption. Covid-19 clients are predisposed to a hyperinflammatory state linked with lung damage [9]. Malnutrition during and after the Covid-19 results in sarcopenia that deteriorates the inflammatory condition [11]. Besides, Covid-19 severe debilitation can increase the disease burden when not rectified by healthy nutrition [12].

Amino acids supplements play the role of reducing inflammation and encouraging quick recovery.

Further studies demonstrate that HDs are essential to improve Covid-19 outcomes. Malnutrition detrimentally impacts the immune system performance, weakening the protection against the virus [8]. The nutritional status and Covid-19 are related, and patients should maintain HDs to improve recovery, eliminate complications and reduce mortality and morbidity.

3. Public Health Initiatives

Moreover, Di Renzo *et al.* assert that prioritizing the public health initiatives during the Covid-19 crisis requires a multidisciplinary approach [11]. It necessi-

tates acquaintance from the biological and medical sciences and humanities disciplines entailing behavioural and social research such as lifestyle modifications and adopting HDs habits. Muscogiuri *et al.* claim that unHDs intensify the risk of evolving obesity that develops complications like cardiovascular disorders and diabetes, which predispose to severe Covid-19 complications [12]. Therefore, it is essential to consume balanced and HDs containing vegetables and fruits that provide micronutrients essential for boosting immune functioning, especially during the Covid-19 crisis. Besides, Calder *et al.* emphasize that nutrition improves the immune system significantly. Vitamins, trace elements, and omega-3 fatty acids are successful immune system boosters [13].

In contrast, insufficient nutritional status deteriorates resistance to viral infections and intensifies disease mortality and morbidity. Public health professionals are inspired to utilize nutritional recommendations and approaches to promote public health [14].

3.1. How Diet Influences Health of the General Population

Furthermore, Laviano *et al.* assert that nutritional status is a significant determinant of public health. Besides, nutrition forms an integral component of managing life-threatening conditions like Covid-19 that are wrecking worldwide health [15]. Thus, HDs are an essential factor directly improving the Covid-19 outcomes. Besides, nutrition interventions are vital to prevent disease progression since Covid-19 quickly advances from cough to respiratory failure. Zabetakis *et al.* elaborate that nutrients like zinc and vitamins C and C are effective in Covid-19 treatment. Besides, diets with antithrombotic, antioxidant, and anti-inflammatory characteristics may lessen or prevent the vascular and inflammatory symptoms linked with the virus [14].

3.2. How Diet Has Influenced the Pandemic

Consequently, it is essential to adopt HDs and shun unHDs like Western diets to accrue beneficial implications amid the pandemic. Jayawardena *et al.* also emphasize that healthy and balanced diets assist in promoting immunity that is crucial in the prevention and treatment of viral diseases like Covid-19. Selenium, zinc, and vitamins D and A supplements are essential during the pandemic [16]. Also, probiotics and nutraceuticals can boost immunity to fight viruses. Therefore, malnutrition demands specialized nutritional care in the Covid-19 pandemic. Furthermore, de Faria Coelho-Ravagnani *et al.* assert that optimum diets can promote health and alleviate the mortality and morbidity linked to Covid-19. High intakes of whole grains, vegetables, fruits, vitamins, and minerals are inspired to preserve a well-performing immune system [17].

Additionally, vegetables and fruits are effective diets to strengthen the immune systems to eradicate the covid-19 severe complication in susceptible populations like cardiovascular disorders and diabetes [18]. Mattioli *et al.* postulate that a worldwide action reinforces physical activity, and HDs are paramount

to inspire people to adopt virtuous lifestyles after Covid-19 [19]. Moreover, Rodríguez-Pérez *et al.* postulate that greater consumption of legumes, fruits, and vegetables during the pandemic has positive implications in preventing the virus and its complications [20]. Further studies show that nutritional remedies like probiotics boost immune functioning and diminish viral replication, helping in Covid-19 management [21]. Besides, Naja and Hamadeh claim that the nutritional state has been regarded as an effective resistance against destabilizers like Covid-19 [22].

Fernández-Quintela *et al.* highlight that optimum consumption of all essential nutrients, especially those improving immune functioning, must be ensured through varied healthy and balanced diets to improve Covid-19 outcomes [23]. Natural bioactive foods decrease inflammatory reactions prevalent in Covid-19. Zinc is a vital determinant of antiviral immunity while zinc deficiencies deteriorate immune functionality [24]. It is effective in yielding acquired and innate antiviral immunity reactions. Zinc also has anti-inflammatory and antioxidant effects. Mishra and Patel state that the immune-strengthening characteristics of macronutrients help fight the Covid-19 disease [25]. Diets featured by plant-based diets were linked with reduced risks and Covid-19 severeness [26].

Additionally, covid-19 lockdowns have led to positive eating habits such as a rise in cooking foods [27]. Further research shows that HDs consumptions change the negative implications of lockdown, such as depression [28]. Moreover, Bakhsh *et al.* declare that the Covid-19 crisis has compelled governments worldwide to enforce stringent nationwide lockdown strategies that have modified lifestyle and dietary behaviors globally [29]. Most individuals have embraced cooking their meals, ensuring a well-balanced diet. Besides, higher fruits and vegetable consumption can promote healthy livings. Also, Moscatelli *et al.* hypothesize that nutritional supplementation is essential for paramount immune outcomes that encourage proper cell performance and better fight against Covid-19 [30].

3.3. Molecular Connection between Health Diet and COVID-19 Outcomes

Healthy eating is paramount in COVID-19 in that it reduces the mortality rates from the disease by strengthening the immunity of the individual. The strengthening of the immunity is usually through the influence of innate immunity and adaptive immunity [31]. The strengthening of the two fundamental lines of immunity is vital in ensuring that the individual can fight the diseases better [32]. In addition to that, the body is able to release some cytokines that are key in fighting the invading pathogens, including the viruses that might invade the body of the individual. The mechanisms thus underlie the molecular basis for the role of a HD in the prevention of adverse COVID outcomes.

Thus, healthy eating habits have served an important role in improving the outcomes from the disease. The coexisting epidemiologic association has been proved through the use of various epidemiologic studies that have clearly indi-

cated an association between healthy eating and the reduction in mortality rates [33]. The studies have indicated that the patients who engage in healthy eating are at a significantly lower risk of mortality rates. The case fatality rate among that population is usually lower than in the general population.

In addition to healthy eating habits, immunity can also be strengthened through some processes such as vaccination. The vaccination process usually functions through the improvement of the body fighting capability in the body, and it has largely been utilized as a way of boosting the immunity of an individual [34].

4. Conclusion

In conclusion, a well-balanced diet boosts immunity. Strong immunity acts as the body against microorganisms such as viruses. Unhealthy nutrition negatively impacts the immune systems' ability to resist diseases. Minerals and vitamins are essential supplementations necessitated by the body in minimal quantities for ideal performance. Therefore, a HD is of paramount significance against Covid-19.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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Abbreviations and Acronyms

HD: Healthy Diet; HDS: Healthy Diets; unHD: Un Healthy Diet.