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Review Article

Boosting the Immune System by Sport Activity and Nutrition Against Coronavirus (COVID)

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Abstract

This has become a public health issue with the introduction and epidemic of the coronavirus COVID-19 in Wuhan, China because of the severe respiratory infections that it induces in humans. Like most coronaviruses invade animals through their development through strains that pass the boundary and then infect the humans. Nevertheless, there is currently no one reliable vaccine for the treatment of the Coronavirus that has led to a variety of people to find safe and successful solutions to cope with COVID-19. It is also seen that the coronavirus infects the most of the people that lack in immunity and thereby it is found out the immune system in the human plays a crucial role in dealing with such infected virus. Further, it has been also found out that exercise, physical activities, healthy diets are a few of the variables that help in boosting the immune system. This led to a decrease in the chances of the occurrence of viruses in humans. Besides, meditation is also another tool that is very effective in managing the functioning of the immune system in a better manner, which in turn reduces the severity of the infected virus. The effective immune system facilitates in increasing the immunity and thereby declines the chances of getting affected with the infected disease. In a similar context, the objectives of the research are to evaluate the impact of COVID-19, identify the SARS-CoV-2 effect on the immune system, evaluate the relation of nutrition and immune system, and impact of sports activities on the immune system. The question of the research is whether physical activities and the immune system are of crucial significance in reducing the chances of occurrence of infected disease coronavirus? Further, it is identified from the findings that COVID-19 emerged due to coronavirus and is spreading frequently in-person to persons. The effective way to remain protected from such a virus is to develop a strong immune system with the help of various methods such as exercise, nutrition, meditation, and various other means.

Keywords: Coronavirus (COVID-19); Food Attitudes; Sports activities; Immune Systems

Introduction

Research background

Coronavirus or COVID-19 is among the family of coronaviruses that cause viral disease or infection in humans and animals. In the case of humans, coronaviruses cause respiration related infections or diseases that carry symptoms of the common cold and may also lead to chronic diseases such as severe acute respiratory syndrome (SARS) and Middle East Respiratory Syndrome (MERS) (ECDC, 2020). In the year 2019, a new pandemic appeared and spread globally, named as COVID-19, which is the currently discovered coronavirus. COVID-19 emerged in Wuhan, a city in China and spread quickly across all the country as well as to various other nations worldwide and became a global [35].

COVID-19 impacts different individuals in distinct ways. The symptoms range from fever, tiredness, common cold and dry cough to aches, sore throat, loss of smell and taste, headache and various other related symptoms. Further, everyone is at a threat of getting infected by COVID-19, in case exposed to the virus. However, some individuals are more prone to develop those mentioned symptoms severely as an outcome of the disease or infection with COVID-19 than others. Most people recover from COVID-19 viral infection; however, 20% of them get seriously ill because of the difficulty in breathing. People of old age and those people having lung and heart issues, high blood pressure, cancer, diabetes are at a highly substantial threat of developing major illness [39]. These people may require intensive care at the hospital to support them in breathing, and even the COVID-19 might prompt to death of few people, especially the old age people, people with chronic disease, people with high obesity and lactating and pregnant women. Further, it has been found that 80% of deaths occur in the case of people who are already suffering from chronic diseases or cardiovascular diseases. Besides, more than 50% of all the deaths included people of more than 80 years of age [40].

The immune system of human beings plays an essential role in the possibility of suffering from a viral infection due to COVID-19. The immune system of human beings has a complex network of

molecules and cells designed and developed to free the human body from diseases and infections. Particularly, the immune system of the human body consists of white blood cells (WBCs) that fight against viruses and bacteria to protect the human body [32]. There are multiple factors that play a crucial role and impact human life conditions like lifestyle, age, gender and most importantly, the health status. An optimum level of sports practices and nutrition highly enhances the immune system and prepares itself to safeguard the human body from dangerous viral diseases and infections. Sports activities and immune system both play a vital role in strengthening the human body. Further, currently, there is no verified vaccine or medicine against COVID-19. The only current defence is the immune system by way of practicing sports and proper intake of nutrition as it supports the natural capability of the human body to defend and protect against various pathogens such as viruses, fungi, bacteria, protozoans and various other related microbes [24].

Research aim and objectives

The target of the research work is to detect the importance of nutrition and sports activities in boosting the immune system of the human body. In the context of the target or aim of the research, the objectives of the research are highlighted below

- To evaluate the impact of COVID-19
- To evaluate the impact of ARS-CoV-2 on the immune system
- To evaluate the importance of proper nutrition and sports activities for enhancing the capacity of the immune system to fight against the novel COVID-19 viral disease or infection.

Research question

The research question of the presented study is regarding *"How nutrition and sports activity helps in boosting the immune system of human body to fight again the Novel COVID-19".*

Research significance

The significance of this research is to show the protective measure people in this COVID19 epidemic can adopt to safeguard themselves with the risk of infection by taking consuming optimum nutritious diet and adapting sports or physical activities to boost the immune system.

Literature Review

Introduction

The emergence of COVID-19 viral disease has led the global population to face a new pandemic. COVID- 19 directly transmits from one person to another when close contact is made with the person who is infected with the viral disease. The viral disease is having a considerable effect on the lives of people in the entire world [36]. Further, the symptoms of COVID-19 are common like fever and hard cough whose intensity also varies from person to person, as some people show no or very fewer symptoms of COVID-19. Therefore, it is not easy to detect people infected with COVID-19 from among the billions of population [13]. Countries are trying very hard to defeat the virus by developing a vaccine and simultaneously treating people infected from COVID-19 to make them well again. Immunity plays a crucial role in combating the viral disease because of the presence of immune cells and molecules that prevent hospitalisation and death [34]. Hence, an optimum level of the strong immune system helps in avoiding major issues due to COVID-19. In order to enhance the immunity system, an optimum level of nutrition and practising sports activities is necessary to combat the COVID-19 viral disease to safeguard the human body.

Immune Systems and COVID-19

COVID-19

In the viewpoint of Gu, Hang, COVID-19 or coronavirus is a kind of virus that leads to the occurrence of respiratory disease or infection and COVID-19 has put a substantial effect on individuals living in the entire globe. The primary way of transmission of COVID-19 is by way of close personal contact and touch, especially the respiratory sprinkles or droplets flying or transferring from the infected human that is absorbed or sucked up by various mucous membranes of the healthy humans, especially by the mucous membrane of the nose and larynx. Hence, this is the primary reason for the simple transmission of novel COVID-19 among various humans (Gu, Hang). However, Giamarellos-Bourboulis., *et al*., 2020 added that the degree of COVID-19 infection varies between different humans as some of the people carry no symptoms of Severe Respiratory Failure (SRF) that needs medical treatment or intensive care and the individual has to be supported by the ventilators. Further, it can also prompt various injuries or risks to other organs of the body [11]. In the same context, Menni., *et al.,* (2020) has put light on the symptoms that vary from person to person, as COVID-19 is identified by shortness of breath, fever, dry cough and various other related respiratory symptoms. Pneumonia is quite a common and dangerous manifestation of the body, along with the COVID-19 disease. In addition, a person with COVID19 also displays gastrointestinal symptoms, rashes, nervous effect and muscle pain [21]. According to Balfour, coronaviruses are big viruses which are encapsulated or encased in the sense-positive Ribonucleic acid genome. Multiple proteins are there in the two-layered lipid layer.

Further, the S glycoprotein (SP) or spike involves two S domains that are responsible for making the entry into an influx of human cells and molecules along with invading the S11 and S2 realm. In the S1 anatomical structure, the binding realm or domain makes

contact with the enzymes for angiotensin two or ACE2 on the surface of the host cell. S2 is widely considered to be the incharge of viral entry and fusion with an enormous affinity [3]. According to majgid., *et al*, the ACE2 receptor is higher in the old age people as compared to children and young people, and hence, the rate of infection is high in the old age people. When humanssuffer from COVID-19 pneumonia, the number of enzymes in the liver, kidneys and heart is enhanced as per the tissue status of the angiotensin two receptor. This describes the situation and interrelation of various organ failures in some patients (majgid).

SARS-CoV-2 impact immune system

In the words of shang, since both the SARS-CoV-2 and SARS-CoV have a common cell entry medium, the pathogenesis of SARS-CoV-2 and SARS-CoV can be the same or highly similar to each other. ACE2 is the familiar element that tie-ups with the apparent S glycoprotein on the surface of the virus. Therefore, it has been noticed that these bindings are essentially sensed by the Toll-Like Receptor-7 or TLR-7 that is visible in endosomes leading to the secretion or emission of inflammatory cytokines. Angiotensin 2 is more considerably expressed in some human body organs such as lungs epithelial cells or molecules, especially the type two pneumocytes as well as in the cells of kidneys, heart, liver, bladder and gastrointestinal tract. Thus, these mentioned organs constitute the primary targets or attack points for the virus [30].

As opined by Brann, following the entrance of SARS-CoV-2 in the cell or molecule, the viral Ribonucleic acid genome is shifted from the cover into the cytoplasm; hence, the translation procedure starts. After the replication of the Ribonucleic acid, new viral molecules are made by incorporating a piece of the cell membrane of the host in the latest viral cover or envelop (Brann).

Further, Qiuan added that the buds of SARS-CoV-2 from the infected cells do not transform directly. The epithelial cells of the infected lungs produce interleukin IL-8 that behaves as a chemoattractant for T lymphocytes and neutrophils. The innate or initial immune response is primarily triggered by the lung epithelial cells, neutrophils and alveolar macrophages. Further, in the next level, the flexible immune responses are provoked involving B and T lymphocytes to fulfil the overall immune response [28].

In the viewpoint of Mogensen (2009), the particles of the virus, including single-stranded Ribonucleic acid, act as a pathogen-related molecular pattern or PAMPS. These also induce a powerful inner immune response after the detection by the Toll-like receptor 7 that is shown on Dendritic Cells (DC) and monocyte-macrophages. TLR7 has the capability of activating various elements like κB (NF-κB), interferon response factor 3 (IRF3), IFR7 and activator protein 1 (AP1). Therefore these signalling cascades prompt to enhanced secretion or excretion of proinflammatory cytokines such as IL-1, IL-6, tumour necrosis factor α (TNF-α), monocyte chemoattractant protein-1 (MCP-1), MIP-1A and finally interferon 1 (IFN1) [23].

According to Delgado-Rizo, neutrophils are further speedily sent to various sites of the infection, where they destroy or kill viruses by a defensive secretion, neutrophil extracellular traps (NETs) and oxidative burst [9]. Along with the mentioned incidents, the presence of antigens considerably stimulates the human body's unique adaptive immunity (both cellular and humoral immunity) that culminates within seven to fourteen days after the viral infection. According to Cano, following the representation or depiction of the antigens by the APCs to the CD8+ and CD4+ T-cells, the pro-inflammatory cytokines are formed by way of NF-κB signalling pathway. The activated B cells generate virus-specific antibodies, whereas antigen-specific T cytotoxic cells destroy the cells infected by the virus [8].

Further added by Kany, the neutrophils, granulocytes and Th17 cells generate or secrete IL-17 that in turn stimulate the generation of IL-6, IL-1, MCP-1, IL-8, G-CSG, Gro-a, PGE2, GMCSF and TNF-α [18]. All these mentioned mediators are able to enhance the recruitment of monocytes, monocytes and various other related immune cells or molecules. In the words of Prete., *et al.*, (2020) it has also been noticed that IL-17 phrase is correlated with multiple inflammatory respiratory diseases and all these immune reflecting ways are designed to form an inflammatory surrounding with the aim of eradicating SARS-CoV-2 [27].

Nutrition and Sports Activities to Improve Immune Systems-VS paraphrase only

Nutrition and immune systems

According to Gogus (2011) and Health (2020), nutrition plays an effective role in building the immune system stronger. Which in turn assists in protects against infection and viruses [12,15]. The deficient diets mat result in severe malnutrition. Besides, there are several factors that affect the status of nutrition like gender, age, and medications [6,22]. During COVID-19, the status of nutrition among the individuals was used for the purpose of measuring the recoverable capacity. Nutrients help in activating the human cells and gene molecules, which directly impacts the immune system [41]. Additionally, the various components of nutrition facilitate in developing microbial gut that contributes to individuals' immune response [14]. The consumption of vitamins such as A, B6, B12, C, and E is also beneficial for making a strong immune system.

A balanced diet can provide a powerful immune system that will help in combating viruses [19,33]. There is currently no evidence of any supplement that might boost the functioning of our immune system, with the exception of vitamin C. Vitamin C is a water-soluble vitamin which tends to establish a strong immune system [4]. At present, there is strong proof of supplement that guarantees the strong immune system, with the exception of vitamin C. It is a water-soluble vitamin that facilitates in boosting the immune system [4]. The daily minimum dosage of vitamin C for men is 90 mg per day, and for women is 75 mg per day [31]. In the current pandemic, people should know about the various kinds of foods that help in boosting the immune system to combat the coronavirus. In the viewpoints of Aman and Masood (2020), they believed that the consumption of healthy food is compulsory in order to compete with the virus and develop a strong immune system. The consumption of fresh fruits and vegetables such as ginger, garlic, banana, kale, strawberry, orange, grapefruit, and red meat facilitates in managing the immune system and thereby fighting with the virus in a better manner [2].

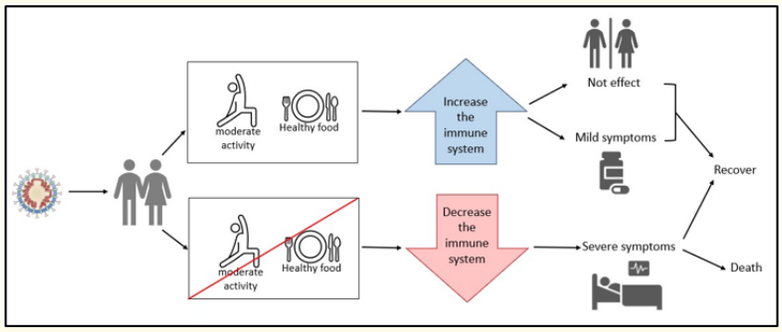

Figure 1: Nutrition and Sports activities to improve immune systems.

WHO in its report has reported that people should ignore the consumption of foods or other items that has a high level of salt, sugar, and fat [37]. The less cooking of vegetables, choosing healthy foods, drinking around 8 to 10 glasses of water on a regular basis assists in transmitting nutrients to the blood cells and controls the body temperature [26]. Further, Black and Slavich (2016) stated that in order to protect the people from the coronavirus is necessary for them to adopt the practice of staying at home. The meditation, sound sleep, and exercise also facilitate in developing the lifestyle healthier, which in turn smoothen the immune functioning [5].

Sports activities and immune systems

There is a strong connection between sports activities and the immune system. As per the report published by WHO (2019), it is identified that the physical activity among various individuals differs due to intensity [38]. Exercise is the best way for reducing the infection-related risk such as infection related to upper respiratory because the exercise directly impacts immune system functioning [25]. The performance of exercise from moderate to intensive helps in boosting the immune responses, which in turn impacts the immune system in a better way.

According to Jaggers and Hand (2016), exercise has a positive impact that helps in bettering the immune system in various diseases like diabetes, cancer, heart disease, and obesity [17]. On the contrary, Zhu (2020) believed that extend and intense exercise also has an opposite effect that is linked with the infection of the upper respiratory system. This highlighted the fact that decreasing moderate exercise activity or increasing the exercise of high-intensity over a longer-term contributes to increased infection exposure [42].

Exercise and PA result in a significant impact of leukocyte movement in the tissue and blood [1,29]. The IgA concentration and excretion rate while rests are some of the positive signs of the immune system that is increased in the humans who conduct the moderate exercise on a regular basis. Iwasaki, Foxman, and Molony (2017) stated that the immune system comes in the top list of defense mechanisms against pathogens of the upper respiratory tract [16]. Lactoferrin facilitates in blocking the receptors host, which in turn helps in preventing cells from the attraction of RNA virus infection.

Campbell and Turner (2018) believe that physical activity boosts the control of immunity against infected diseases; however, the same is depending on the level of exercise conducted by humans [7]. Thus, it is inferred from the above that the moderate exercise on a regular basis boosts the immune system. It is also revealed that the exercise may have serious concerns over the upper respiratory systems such as breath shortage and the development

of infection [10]. However, this rule does not apply to athletes who are accustomed to regular exercises of high intensity.

Summary

COVID-19 causes respiratory-related issues or problems in people that may also lead to the failure of their respiratory organs and result in death. However, the state of the human body is essential for combating the COVID-19 viral disease as people have significant COVID-19 symptoms, while some have mild or some lack of COVID-19 symptoms. The immunity level in the human body helps in preventing the major issues created by viruses and bacteria. The people of old age and humans with various prior problems such as lungs or heart-related difficulties are more prone to get infected by COVID-19 because the ACE2 receptor is higher in people of old age and the ones who suffer from various other health-related issues. Therefore, in the ongoing period of time, enhancing immunity is the only possible way to prevent the risk of novel COVID19 viral infection. Nutrition and a regular sports activity is highly vital to keep a powerful immune system to combat viruses. An optimum level of nutritional intake activates the protective cells in the human body that helps to fight COVID-19 viral disease, and daily sports activity bolsters the immune system to tackle such viral issues.

Data Analysis, Results, and Discussion

Introduction

The chapter reflects the findings of the present research that are identified with the help of various academic sources. The themes namely impact of COVID-19, impact of virus on immune system, nutrition to support immune system, and sport activities to support immune system are presented hereunder. The thematic analysis includes the findings of the present research. Further, the discussion is also incorporated in align with the objectives of the present research.

Thematic Analysis

Theme 1: Impact of COVID-19: COVID-19 is a disease that is caused due to newly emerged coronavirus, which in turn affects the lives of so many people all across the globe. It has been argued in the present research that the people who infect with such disease face life-threatening illness, while it is also seen that some people recover without taking any precautions. The key reason behind the spread of such a virus in a frequent manner is because it transmits from one person to another through droplets generated while coughing or sneezing. It is also discussed that it affects in varied ways as it is seen in some of the infected patients that there is no symptom of a virus; however, on the other side, there are various symptoms like breathing problems and fever, which directly affects the respiratory system of the individuals. It is also identified that the viruses condense into the RNA genome. The virus pneumonia enhances the kidney and heart enzymes level, which in turn results in the patients' organ failure. It has been generalised that life can be secured from the negative effect of COVID-19 through maintaining social-distancing and hygiene norms and through boosting the immune system.

Theme 2: Identification of the impact of SARS-CoV-2 on Immune System: SARS-CoV-2 and SARS-CoV both have similar means of cell entry and thus the pathological process for bosh such viruses are alike. The rseults of the findings reflected that the factor ACE 2 directly affects the lungs, bladder, kidneys, and heart, which thereby causes the emergence of viruses among the individuals. Besides SARS-CoV-2 and SARS-CoV, the RNA genome is also another viral that is transmitted to the cytoplasm that in turn initiates the process of virus emergence. Additionally, it is also found out that neutrophils are injected to the infected sites; wherein, they kill the presented virus in the human organs with the help of defensin secretion, and oxidative burst. Further, it is also analysed in the research that neutrophils, Th17 cells, and IL17 granulocytes secrete braces the TNF-α, IL-1, GM-CSF, IL-6 and 8, G-CSF, MCP-1, PGE-2, and Gro-a production. All these attributes foster neutrophils, immune cells, and monocytes recruitment. Moreover, it is also identified that IL-17is associated with inflaming respiratory illness. All such mechanisms of immune signaling are built to develop an inflammatory environment for the purpose of attaining the objective of exterminating SARS-Cov2.

Theme 3: Nutrition and its relation with the Immune System: Based on the identified negative effects of COVID-19 in the above themes, it has been reviewed from the literature studies that nutrition plays a crucial role in developing the immune system and thereby saving the people from getting infected with the viruses. It is found out that age of an individual, gender, and lifestyle are some of the factors that affect nutrition among individuals. The nutrition helps in increasing the contents of various vitamins in the body. A balanced diet guarantees an effective immune system, which in turn facilitates in fighting with the viruses existed in the human organs. Although, the discussion of the findings reported that there is no clear proof of any supplement that enriches the immune system functioning, yet boosting the immune system is vitally important to fight against virus. It is identified that the only supplement that boosts the immune system is a vitamin C. The present research based on the facts have evaluated that people should focus on heathy diet and consume only those foods that increase their immune system, which in turn helps in fighting with the coronavirus. Further, it is also supported by many researchers that the consumption of fresh vegetables, fruits, and drinking approximately 8 to 10 glasses of water on a regular basis, helps in making the immune system strong. Besides, the functioning of the immune system can also be increased by doing proper meditation and exercises. Thus,

it has been analysed that strong immunity facilitates in fighting with the virus and reduces the chance of getting infected.

Theme 4: Physical Activities affect the Immune System: In the context of boosting immunity, it inferred from the studies that physical activity level fluctuates among people and thereby it is bifurcated under the four categories for the purpose of identifying the relationship between the physical activity level and its related benefits. Several literature studied supported the argument that exercises on a regular basis improvise the immune system and thereby facilitate in keeping away the people from the virus. Besides, daily exercise also assists in preventing from diseases like diabetes, cancer, heart attacks, and many more. On the contrary other studies have reflected that extended exercise may harm the people in respect of increased infection in the upper respiratory system. Further, the findings of the report have identified that exercise provides several other benefits as well like improved IgA concentration and expelling waste matter from the body. Lactoferrin is also crucial since it prevents cells from getting being infected with other viruses such as RNA. Overall, the findings of the research have signified that the exercise of moderate-intensity facilitates immune system improvement at a fast pace.

Discussion

In alignment with the first objective of COVID-19 impact, the present research has discussed that the coronavirus affects the respiratory systems of humans. This infectious disease spread at the fastest rate and vulnerable for older people who suffers from chronic illness and children due to their weak immune system Sneeze and cough droplets increase the rate of virus emergence. It is identified that the COVID-19 has not any specific symptoms, since, it is seen in various infected people that they have not a single symptom of the virus. On the contrary, several symptoms are also there, which shows the symptoms of coronavirus such as fever, cough, and pain in the muscles. Further, the above research is also discussed that the rate of infection rate among the adults is high as compared to the children and the main cause behind such a high rate in the adults is due to the ACE2 receptor, which enhances the chance of getting infected. Thus, it is evaluated that COVID-19 is a type of disease that is spreading in humans to humans and there are not any specific symptoms yet, which guarantees the existence of viruses in humans.

In respect to the second objective related to the impact of SARS-CoV-2 on the immune system, the above research has discussed that SARS-CoV-2 and SARS-CoV have the same cells and thereby the development of both the viruses are similar. It is revealed that organs such as the liver, kidney, bladder, and heart are mainly expressed by ACE2, which constitutes the emergence of such a virus. Further, T and B lymphocytes also facilitate in improving the immune response. Moreover, there are various variables discussed in the present research such as Il-1, PGE-2, MCP1, IL-6, GM-CSF, and IL-8, which facilitate the development of monocytes and neutrophils in the human organs. Therefore, it is inferred that SARS-CoV and SARS-CoV-2 are similar in nature that affects the immune system with the help of incorporation of the virus in the human organs. In context with the third objective of nutrition impact on immune system, it is discussed that the nutrition is of crucial significance for the purpose of maintaining the good health and keeping away from attracting the various diseases such as coronavirus. There are several factors as well that affect nutrition statuses such as the age of the individual, gender, and lifestyle.

Inadequate nutrition causes the development of disease and viruses [6,15]. Further, it is discussed after identifying the various secondary sources that consumption of vitamins, healthy foods, fresh fruits, and vegetables also facilitates building a strong immune system. The drinking of water several times a day, the use of less sugar, meditation, and sound sleep are also several factors that help in boosting the immune system. Thus, it is identified that good nutrition has a significant impact on the increased immune system that helps in eradicating the virus. Additionally, it is also discussed in the context of the fourth objective of sports activities and the immune system that conducting physical activities is beneficial for humans since it assists in improving the respiratory and immune systems [7].

Conclusions and Future Work

Conclusion

The research project has been presented by focusing on the reasons or factors leading to the ongoing epidemic caused due to COVID-19 that has emerged at the end of the year 2019 and is impacting the population of all the countries across the globe. As COVID-19 is a respiratory related disease or infection, it directly impacts the lungs, heart and kidneys of a human body due to which many people have already lost their lives globally. The primary channel of transmission of COVID-19 is by making close contact and touch with the infected person. The significant impact of the viral disease is seen more on the old age people as well as people who are already suffering from any minor or major health issues especially people suffering from cardiovascular disease or any chronic infection or disease. Further, an adequate level of the immune system helps in fighting with the novel COVID-19 and various other bacteria and infections [20]. Therefore, in the current period, bolstering the immune system by consuming highly nutritious food and performing a daily physical activity is important to prevent any major damage caused by the viral infection on the human body.

Nutrition is essential as an inadequate diet leads to make the human body more prone to various diseases, especially the COVID-19 viral infection. Adequate consumption of iron and zinc along with vitamin C, E, B6, A and B12 guarantees a powerful immune system. Along with taking an optimum level of nutritious diet by various food intakes that are not high in salt, fat and sugar, it is also important to maintain an adequate distance from people to decrease the chances of getting exposed to the novel COVID-19. Therefore, a healthy lifestyle is critical in the current period of time to boost the functioning of the immune system by way of meditation, exercise and regular sleep. Furthermore, it has been noticed that sports activities and exercise have an impact on the proper functions of the white blood cells of the immune system that prompts to decrease the threat of infections or diseases. Moderate and intense physical activity enhances the response of the immune system due to multiple positive changes in the human body. Perhaps, sports activities also improve various immune producers for conquering heart diseases, obesity, cancer and various other related disorders. The immune system is the first line of defence against upper respiratory tract pathogens.

Future Work

The present research is centred on the need to a proper nutritious diet and sports activities that support in boosting the immune system to fight against novel COVID-19 viral infection. Therefore, academicians could conduct future research on various quantitative and qualitative tools to measure the kind of sports activity and nutrition that helps in enhancing the immune system most.

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