

Research Journal of Pharmaceutical, Biological and Chemical Sciences

A Study To Understand Public Knowledge And Perception Towards Immunity Food Booster's Consumption During COVID-19 Pandemic.

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ABSTRACT

COVID-19 pandemic has brought a significant change in the lives of all population segments. Irrespective of the country, religion, economic status, and position worldwide, a committed thought is developed on "IMMUNITY" and "IMMUNITY BOOSTERS." The nutrition and health portfolio of many populations worldwide reported severe impacts from changing trends in modern lifestyle, food habits, food consumption, and the environment. Defining health remains a crucial task over several decades. The present study is to understand and evaluate the knowledge and purchasing behaviour of the population during COVID-19 time. A survey is conducted through social media platforms with pre-designed and tested questionnaires. Data were collected from 200 respondents. A rapid assessment survey was conducted using Google Forms. Google Form was distributed through various social media platforms such as WhatsApp, Facebook, and LinkedIn in Indian communities residing across the globe. The above data shows that 64% have consumed Vitamin C supplements almost every day for 15 days, 13% for one month, 10% of the respondents more than one month, and 13% took supplements as supplements per the doctor's advice. The results indicate that nearly 73% of the respondents started consuming supplements, 15% sometimes, and 4% of the respondents expressed their consumption was on and off. When questioned in detail, it is mentioned that they have taken supplements. The results depict buying behaviours, reading and understanding the food labels, purchasing supplements and immune boosters.

Keywords; COVID-19, Coronavirus, immunity, Food and nutraceuticals, food habits, food consumption, and environment

<https://doi.org/10.33887/rjpbcs/2023.14.3.9>

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INTRODUCTION

Immunity is the capability of multi-cellular organisms to resist harmful microorganisms. Immunity refers to the body's ability to prevent the invasion of pathogens. Immunity involves both specific and nonspecific components [1]. The nonspecific features act as barriers or eliminators of many pathogens irrespective of their antigen makeup. Other members of the immune system adapt themselves to each new disease encountered and can generate pathogen-specific immunity. Pathogens are foreign disease-causing substances, such as bacteria and viruses, and people are exposed to them every day. The immune system has a very vital role in our system [2]. It protects our body from harmful substances, germs, and cells that could potentially make us ill. It is indispensable to keep a robust immune system safe from infections. A holistic approach is needed to build a good immunity, including good quality food, good sleep, and a lifestyle. The immune system's primary function is to protect the host from environmental agents such as microbes and chemicals, preserving the body's integrity [3]. Specific immunity is further divided into humoral immunity, the one involved with antibodies, and cellular immunity, which T cells orchestrate. It is essential to understand that although these divisions have helped understand and analyze the immune response, the system functions as a single unit rather than as a separate entity [4]. In this paper, a simplified analysis of specific immunity will be given. However, the importance of nonspecific immunity, especially as it pertains to its role in preventing exposure to environmental substances, should not be forgotten.

Immune boosters

All the parts of our body that help fight against diseases and help improve our immunity are collectively named the immune system. Our immune system can detect harmful bacteria and viruses that enter our body – these cells, also known as antigens, attack them by producing 'antibodies.' Various foods, especially fruits and vegetables, have the natural immune booster capacity. Vegetables like broccoli, cauliflower, beetroot, red and green bell pepper, Lemon, Tomato, and fruits like kiwi, oranges, papaya, berries, avocados, have rich vitamin, mineral, contents, and antioxidant properties [5]. Fruits and vegetables are rich in beta carotene, Vitamin C, Vitamin E, Zinc, and many antioxidant properties, which will enhance immunity. All kinds of berries and foods rich in omega-3 fatty acids such as beans, flax seeds, and even some nuts can be consumed to strengthen immunity. And herbs like garlic, cumin, and pepper help as antiviral and immune boosters [6]. Below information the list of effective supplements purchased and consumed during the COVID pandemic.

Few other elements include selenium, an essential nutrient for many processes within the immune system, and deficiency can lead to severe viral infections. Probiotics have been shown to reduce the length of respiratory diseases, mainly colds and flu. A large part of the immune system is in the gut. Probiotics have been shown to help to improve our body's immune response [7]. Probiotics can help improve the good bacteria in the stomach, thus helping the immune system's proper functioning. There is a recommended allowance for each of the elements. A well-balanced-balanced diet consisting of whole grains, fruits, and veggies in every color of the rainbow, complete proteins, and healthy fats will help meet the requirement of all these vitamins and minerals daily needs. Even vegan people now have good options like Fortified foods with vitamins and minerals. Fermented foods like kimchi, sauerkraut, kombucha, miso, and yogurt are also beneficial in the diet, containing probiotics. There is an everyday demand for vitamins and minerals because the body doesn't have reserves [8].

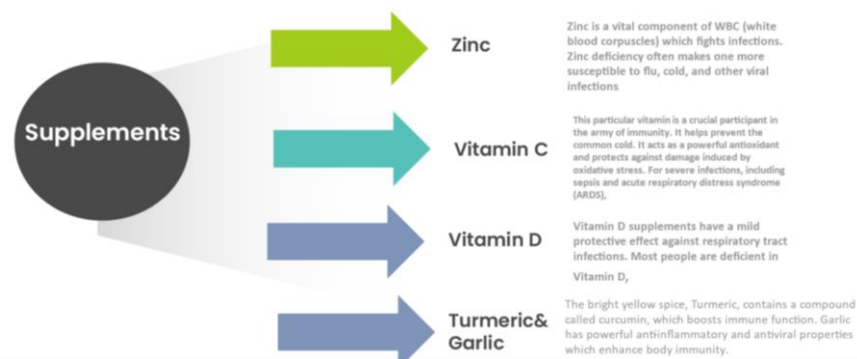


Figure 1: List of Supplements

Dietary Supplements and Nutraceuticals Market during COVID-19

Nutraceuticals and dietary supplements are derived from medicinal and health benefits from natural sources. Nutraceuticals are helpful in the treatment and prevention of infections. The global nutraceuticals market has been increasing rapidly over the past two decades, especially in the COVID times there is a surge in demand for dietary supplements [9]. People believe that nutritional supplements will provide extra health benefits and prevention and immune-boosting effects. In a study by Rauken Insight, 67% of the consumers have increased the consumption of dietary supplements or nutraceuticals for health benefits and immunity [10]. Though there is no robust data to show that Vitamin C, Zinc, and Vitamin D will prevent, there is a massive demand for supplements during the Pandemic. Data released by the research wing of the All India Organisation of Chemists and Druggists indicates that Indian consumers bought more than 500 crore pills of Zinc, Vitamin C, and other multivitamin tablets to boost their immunity amid the Pandemic [11]. AIODC consists of more than 8.5 lakh chemists across India. In 2020, the sales of a multivitamin were more outstanding than diabetes medication. There is a record sale of Vitamin C, Vitamin D3, and Zinc [12].

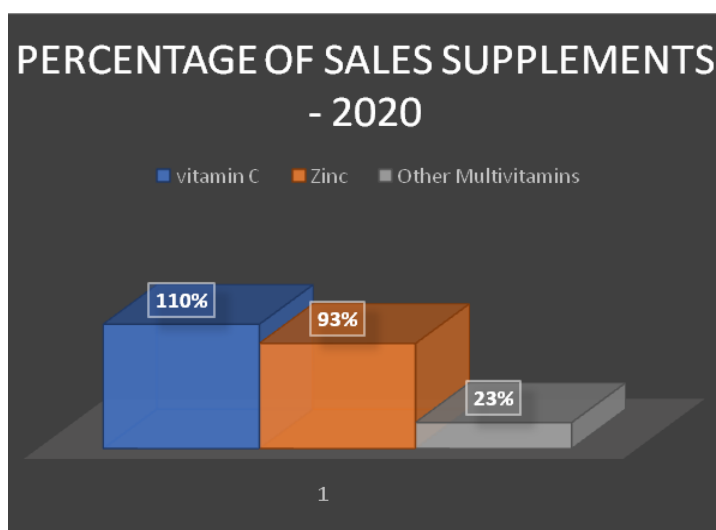


Figure 2: Percentage of Sales Supplements-2020

Adaptive or acquired immunity is a system that learns to recognize a pathogen. It is regulated by cells and organs in our body like the spleen, thymus, bone marrow, and lymph nodes. When a foreign substance enters the body, these cells and organs create antibodies and lead to the multiplication of immune cells specific to that harmful substance and attack and destroy it. Our immune system then adapts by remembering the foreign importance so that if it enters again, these antibodies and cells are even more efficient and quick to destroy it [11]. Immunity is our bodies' ability to provide resistance or protection against diseases and infections caused by viruses, bacteria, parasites, and other harmful microorganisms. So, naturally, immunity boosters are foods, fruits, vegetables, or even help us increase this ability to fight against illnesses. All the parts of our body that help us fight against diseases and help improve our immunity are collectively named the immune system [9]. Our immune system can detect harmful bacteria and viruses that enter our body these cells, also known as antigens, attack them by producing 'antibodies.

Pandemic and nutritional supplements

A pandemic is an epidemic occurring on a scale that crosses international boundaries, usually affecting people on a worldwide scale. A disease or condition is not a pandemic merely because it is widespread or kills many people; it must also be infectious. For instance, cancer is responsible for many deaths but is not considered a pandemic because the disease is not contagious and not even simply infectious. The World Health Organization previously applied a six-stage classification to describe how a novel influenza virus moves from the first few infections in humans to a pandemic [12].

The dietary supplementation of vitamin D may positively affect either insufficient or deficient individuals [11]. Evidence supporting the role of vitamin D in reducing the risk of COVID-19 includes

the fact that the outbreak occurred in winter, a time when 25-hydroxyvitamin D (25(OH)D) concentrations are lowest; that the number of cases in the Southern Hemisphere near the end of summer is typical; that vitamin D deficiency has been found to contribute to acute respiratory distress syndrome; and that case-fatality rates increase with age and with chronic disease comorbidity, both of which are associated with lower 25(OH)D concentration. As a well-known antioxidant, Vitamin E also regulates the immune response [13].

Vitamin C takes part in the development and functionality of various immune cells and the production of antibodies [14]. The contribution of vitamin C in immune response has been suggested due to the enhancement of different cellular functions of innate and adaptive immunity. Vitamin C enhances the part of the epithelial barrier against pathogens and stimulates skin scavenging activity to protect against environmental oxidative stress. In addition, it could accumulate in neutrophils to promote chemotaxis phagocytosis and subsequent microbial killing. Thus, conditions may significantly affect the level of vitamin C because of inflammation enhancement. Interestingly, vitamin C supplementation seems to be able to prevent and treat respiratory and systemic infections [14]. Zinc regulates the signaling pathways in both specific and nonspecific immunity cells. Disorders in the homeostasis of zinc alter the immune response in several ways, resulting in abnormal lymphopoiesis, disturbed intercellular cytokine signaling, and weakening the innate immune response through phagocytosis and oxidative burst. Zinc deficiency is a pervasive disorder, and almost 1/5 of the global population is at risk [14]. The lack of zinc impedes the immune response, reduces pathogenic resistance, and extends the duration and incidence of pneumonia.

Objective of the study

- The objective of this study was to evaluate knowledge and attitude regarding immunity and nutrition
- To understand public knowledge and perception towards immunity food boosters and consumption during Covid 19 pandemic.
- For a better understanding and comprehension of the buying behaviour and purchase decision making of food products.

METHODOLOGY

A rapid assessment survey was conducted using Google Forms. Google Form was distributed through various social media platforms such as WhatsApp, Facebook, and LinkedIn in Indian communities residing across the globe.

Data source

Primary data is the new data collected from the respondents using a Pre-tested questionnaire. Most of the data collected are preliminary data through the survey method, where the researcher and the respondent interact face to face.

Sampling procedure

Sampling is the selection of a group to obtain information about the whole is, a group of persons that represents a particular community. The sampling method used was the random sampling technique. Five areas were selected in Vizag city. Prior permission is taken from the community president, door to door survey is conducted, face to face interviews are conducted to collect the answers from the respondents. Women in the age group of 20 to 30 years participated in the survey. A prior consent form is taken from the respondents.

Sample Population: There are a total of n=200

Sample Size: All items in any field of inquiry constitute a 'universe' or 'population.' A finite subject of the population gives a sample. The statistical units in the model are called sample units. The number of units in the model is called the size of the piece. The target sample consists of 200 respondents.

Conceptual framework

A conceptual framework was developed based on factors that potentially caused changes in food consumption at the individual consumer level during the Pandemic, building on two strands of literature: food choice process and behaviour change. The interplay between food-related behaviours forms the core of the framework. The methods of consuming (what, where, with whom, how often), obtaining (where, how, how often), and preparing food. Food-related behaviour is influenced by the personal food system, i.e., food-related values and strategies, influenced by individual factors, resources, and ideals. We introduced a dynamic perspective by recognizing that food consumption during the Pandemic is related to food consumption before the Pandemic.

RESULTS AND DISCUSSION

The immune system is a natural defence system made up of various cells, tissues, and organs that work together to defend the body from foreign elements, known as antigens. These foreign elements include bacteria, viruses, fungi, and parasites, which confer infections to the body, making one feel or become sick [15]. These foreign bodies are found in a wide range of environments, so that they can be acquired and transmitted in several other ways. The body's defence mechanism finds the antigens and stops them before they can replicate and spread. A healthy body means a healthy immune system that can protect itself against these antigens. The body naturally produces white blood cells, which are crucial in making immune cells for body defence. Depending on the load of the antigen, the immune system responds rapidly by producing specific responders against the antigen in large quantities. The immune system's effectiveness is favoured by its ability to recognize millions of antigens and produce specific immune molecules to combat the antigens [16]. To boost immunity it is essential to take the right kind of foods in the right quantities. During the COVID 19 time, knowledge and consumption of Immune boosters have increased [17]. Consumer awareness has potentially changed purchasing behaviour through social media and other platforms. The results are tabulated in the following headings.

Table 1: Frequency of supplements consumption for – Before COVID 19

Daily	20%
Never	43.50%
sometimes	20%
Dr. advice	16.50%

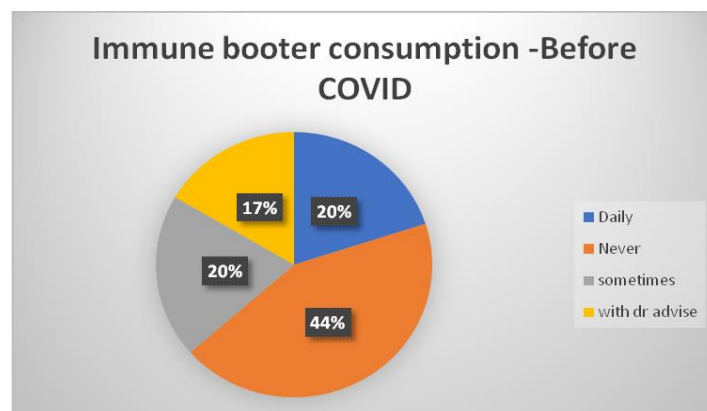


Figure 3: Frequency of supplements consumption for – Before COVID 19

Inference

Before the Pandemic, people are not very serious about daily consumption of immune boosters or diet supplements. Usually, it is taken as the doctor advises when needed, especially during infections or in middle age, or particular conditions. All the respondents were questioned about vitamin and mineral supplements before the COVID 19; the data findings indicate that 43% of the respondents never used accessories before COVID 19 for immunity boosting, 17% with doctor advice, 20% daily depend on supplements, and other 20% daily [18].

Table 2: Supplements consumption during COVID 19

Daily	73%
Sometimes	15.00%
Never	8%
once in a while	4.00%

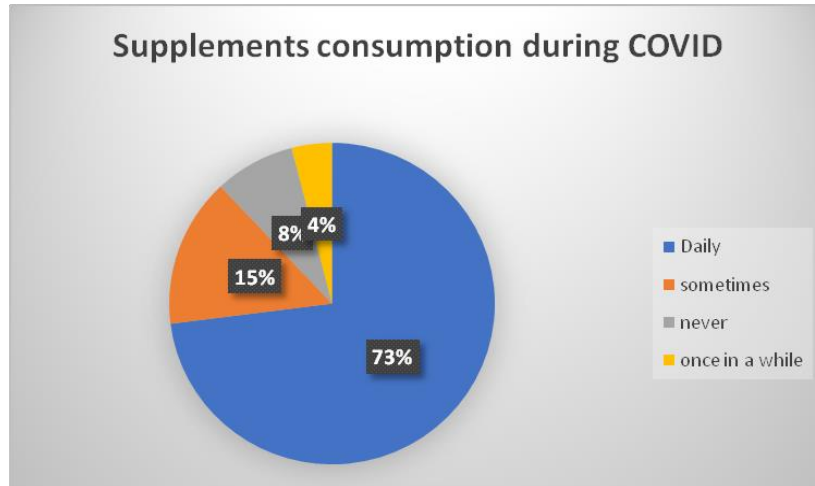


Figure 4: Supplements consumption during COVID

Inference

Ironically during the COVID-19, consumption of the supplements has increased drastically. The results indicate that nearly 73% of the respondents started consuming supplements, 15% sometimes, and 4% of the respondents expressed their consumption was on and off. When questioned in detail, it is mentioned that they have taken supplements as prevention whenever they find any positive case in the community, or they are secondary contacts or exposed [19].

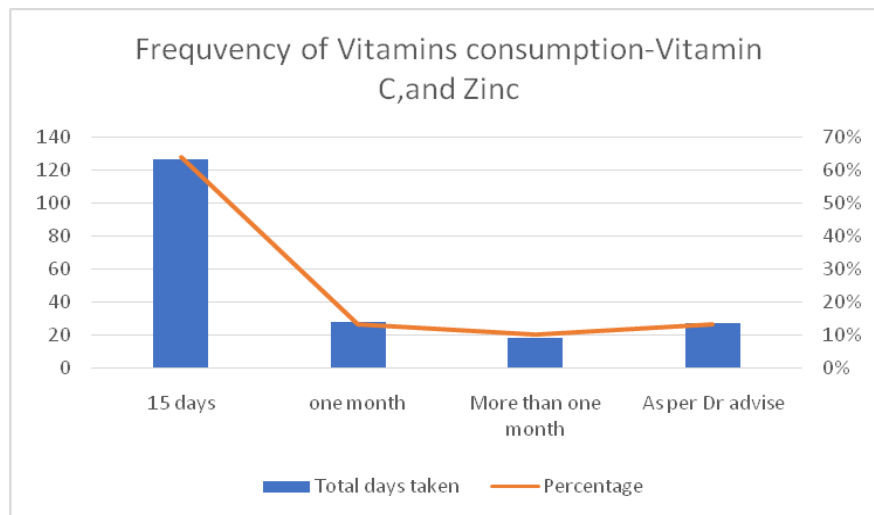


Figure 5: Frequency of Vitamins consumption

Inference

The above data shows that 64% have consumed Vitamin C supplements almost every day for 15 days, 13% for one month, 10% of the respondents more than one month, and 13% took supplements as supplements per the doctor's advice.

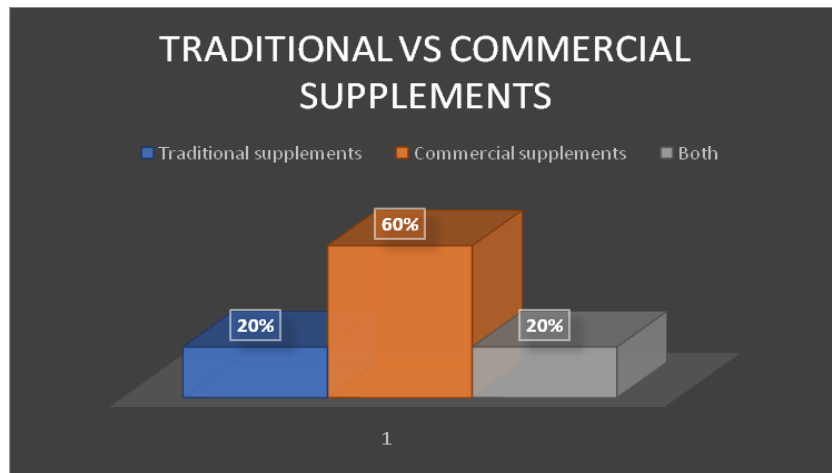


Figure 6: Traditional Versus Commercial Supplements

Inference

During the COVID time, consumers started taking traditional and commercial supplements. Mainly traditional include very simple ingredients available in the kitchen like pepper, turmeric, Jeera, Cinnamon, Ginger, Mint leave. Commercial supplements include tablets like multivitamins, Vitamin C, and Zinc tablets [20]. The graph indicates that 60% of the respondents used commercial supplements, 20% used traditional supplements, and 20% used both [21]. Though there is not enough data to claim that either traditional or commercial supplements will completely prevent or treat the condition, consumers in a panic situation started consuming any supplement which claims to be a preventive or immune booster [22].

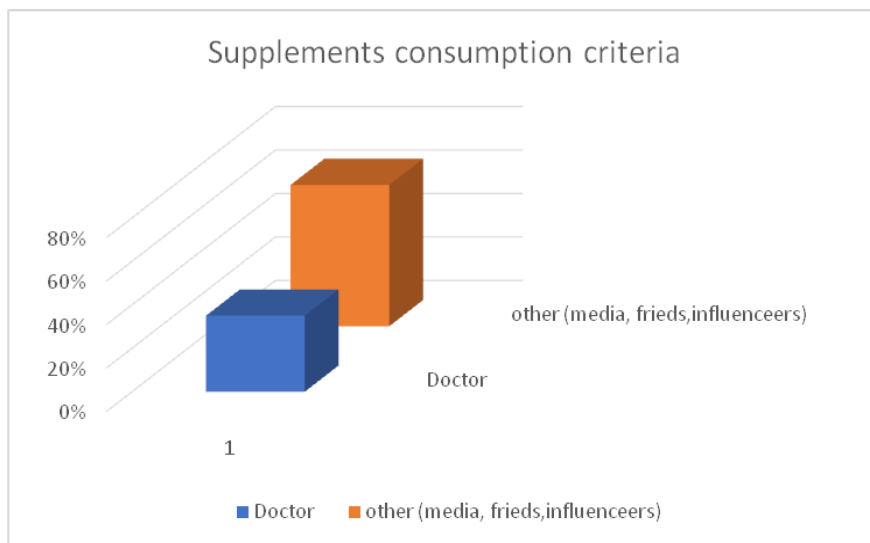


Figure 7: Supplements Consumption Criteria

Inference

In pandemic times, consumers have started taking supplements irrespective of their health status. The graph represents that 65% of the respondents have taken supplements with the influence of media, friends, and other sources. Other 35% have taken supplements with doctors' advice [23].

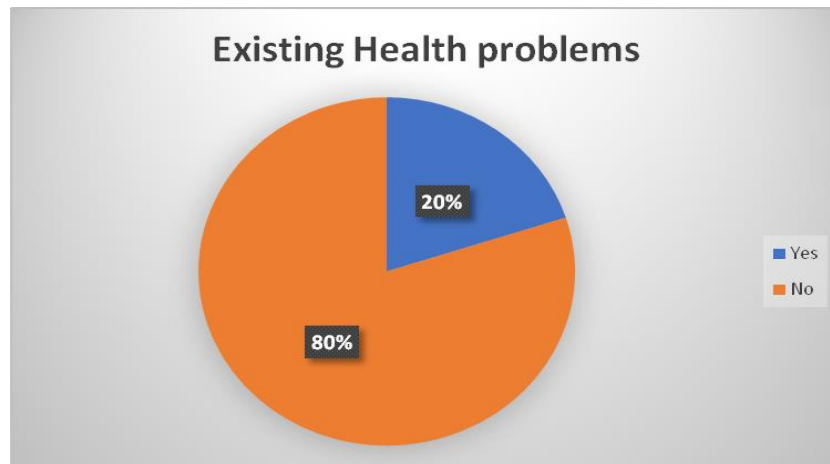


Figure 8: Existing Health Problems

All the respondents are questioned about pre-existing health problems. People with co morbidities like hypertension, diabetes, and issues related to the lungs have a higher risk of hospitalization. The survey included finding out the existing health problems [24]. The results signify that 80% of the respondents aged 20 to 30 do not have any health problems; only 20% have health issues like hypertension, diabetes, and other issues [25, 26].

CONCLUSION

The covid-19 Pandemic is causing disastrous global mortality and morbidity. Therefore, a mighty host immune system is a critical factor for protection against viral infection and avoids reaching essential stages of the disease. It is necessary to be on a good diet to boost immunity. Several vitamins with trace elements, probiotics, and nutraceuticals are required for the proper performance of the immune system. The practice of yoga will play a vital role in improving weakened immunity, and also pranayama helps in the conditioning of the lungs. The findings suggest that people's vision toward health and wellness has improved drastically in the COVID time. People started focusing on improving health and immunity whatever the way. Always taking supplements without doctors' advice is not suitable for health. But a well-balanced diet will and lifestyle changes are always a good option for a healthy mind and body.

ACKNOWLEDGMENT

Author would like to thank Koneru Lakshmaiah Education Foundation, Vaddeswaram, Andhra Pradesh, India for providing support for the study.

Author Contributions; RPKP and KSD conceptualize the study, KSD collected data and interpreted the results, RPKP and KSD wrote the manuscript and RPKP edited and revised the draft.

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