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The Effect Of The COVID-19 Pandemic On Dietary And Lifestyle Habits Of Adult Population In North India

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Abstract

The COVID-19 (Coronavirus Disease 2019) pandemic represents a massive impact on human health, causing sudden lifestyle changes, through social distancing and isolation at home, with social and economic consequences. Knowledge about dietary habits and lifestyle is required to optimize public health.The aim of this study was to investigate the impact ofCOVID-19 pandemic on eating habits and lifestyle changes among the North Indian adult population aged between 18-65 years. An online structured questionnaire was used for data collection. Changes in the dietary and lifestyle habits were observed. People did shift to home-cooked food and shifted away from food prepared in the food service establishments. A decreasing trend in the consumption of processed food was also noted. Positive changes included increased water intake, and consumption of fruits and vegetables, milk, cereals, pulses and nuts. Negative impacts included the consumption of sugary and concentrated sources of energy.

Keywords

COVID-19, Dietary habits, lifestyle, health, immunity.

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Introduction

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the strain of the Coronavirus family that is responsible for the novel Coronavirus disease, also known as COVID-19. It was initially discovered in December 2019 in the Chinese city of Wuhan, province of Hubei (thus the name COVID-19), the infection has spread to practically every country in the world. The largest pandemic of the century, this coronavirus epidemic was deemed by the WHO to be a "Public Health Emergency of International Concern" on January 30, 2020, and a "Pandemic" on March 11, 2020.

Even with the arduous efforts of doctors working around the world to find a permanent treatment or vaccine and taking into account the morbidity and mortality involved, mankind was still compelled to quarantine themselves in their houses. Globally, there is severe economic turmoil and a significant death toll. Furthermore, it appears that serious COVID 19 consequences are more likely to affect our society's most defenseless and immunocompromised members. There are a number of important risk factors found for severe COVID-19 infection. The existence of non-communicable diseases (NCDs) like diabetes mellitus, chronic lung diseases, cardiovascular diseases (CVD), obesity, and several other illnesses that damage the patient's immune system.

Movement and social gathering restrictions also had a negative impact on people as individuals. Long-term confinement indoors due to the COVID-19 epidemic can eventually result in stress-related conditions that can drastically alter our eating patterns. Stress eating is a major problem since it's simple to overeat when individuals are worried about their next paycheck, seeing food go from the grocery store shelves, and staying home for days on end (Campana, 2019; Brooks, 2020). People are typically sociable creatures, so this period of social isolation may put them under psychological pressure and cause some of them to eat more frequently or in larger quantities as a coping technique for the mounting worry and anxiety (Abbas, 2020). Living under continuous stress results in the body releasing cortisol, which makes one feel hungrier (Gluck, 2004).

Firm closures result in job loss. Movement restrictions caused a shortage or unavailability of food, medicine, and other necessities in many areas. The exponential increase in the number of infected people and the resulting illness and mortality altered the lifestyle habits of people all around the world. The entire family is practically staying at home as a result of everyone being forced to work

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from home and schools and universities moving their classes to an online format. This puts an additional load on the kitchen in terms of quantity as well as the variety that needs to be managed. In order to cut down on the time needed for food preparation and cooking, an increase in the use of processed and ready-to-eat foods is observed (Ruíz-Roso et, al (2020). This pandemic crisis has not only impacted dietary patterns, and lifestyle habits, but also the food sector. which is still struggling to get back to normal. Health clubs/gyms also struggling to stay in business.

Healthy diets are important for supporting immune systems. Also, nutrition can reduce the likelihood of developing other health problems, including obesity, heart disease, diabetes and some types of cancer ("Healthy At Home: Healthy Diet"). WHO impressed upon the intake of a healthy diet as it is very important during the COVID-19 pandemic. While no foods or dietary supplements can prevent or cure COVID-19 infection, healthy diets are important for supporting immune systems.Hence, the current study aims to study the effect of the ongoing pandemic situation on the dietary and lifestyle habits of adult individuals across North India.

Review of Literature

In a review by Zabetakis I *et al*, inflammation associated with pre-existing comorbidities was highlighted as a significant risk factor for COVID-19 patients. The potential role of a person's nutritional status, nutrients and foods that may exert anti-inflammatory and immunomodulatory effects was explored. Nutrients such as vitamin C, vitamin D, and zinc held some promise for the treatment of COVID-19. Likewise, nutrients with anti-inflammatory, antithrombotic, and antioxidant properties might prevent or attenuate the inflammatory and vascular manifestations associated with COVID-19. Indeed, following healthy dietary patterns and avoiding unhealthy dietary patterns might have beneficial effects against infection but more research was required in this aspect. It was concluded that maintaining a healthy diet and lifestyle during the pandemic was vitally important (Zabetakis, 2020).

A questionnaire survey was conducted in Italy by Scarmozzino F *et al*, to assess the effects of COVID-19-induced confinement policies on the self-reported food consumption of self-selected Italians. The questionnaire was diffused via the internet. The results showed that nearly half, i.e., 49.6% of responders did not substantially modify their diet during the lockdown; however,

46.1% of them reported that they were eating more during confinement, and 19.5% gained weight. In particular, increased consumption of "comfort food", notably chocolate, ice cream, and desserts (42.5%) and salty snacks (23.5%) was noted and was attributed to higher anxiety levels. A decrease in alcohol consumption was reported by 36.8% of responders and an increase was reported by 10.1% of respondents. Further, 21.2% of respondents reported increased consumption of fresh fruit and vegetables. The 33.5% of respondents who reported decreased consumption of fruits and vegetables, attributed this change to lower availability and ease of purchasing such items. Over half of the responders, i.e., 56.2%, reported that fruit and vegetables did not appeal to them while in lockdown. The purchase of ready-made meals was reduced by nearly 50%. It was suggested that large-scale similar studies should be undertaken worldwide to help public health authorities shape their reactions to any future unavoidable pandemics (Scarmozzino, 2020).

A retrospective study was conducted by Barrera L*et al* in Italy, to investigate the effect of quarantine on sleep quality (SQ) and BMI of the participants, and if change in SQ was related to working modalities. One hundred and twenty-one (121) adults were enrolled and assessed at a gap of 40 days. Anthropometric parameters, working modalities and PA were studied. Sleep quality was evaluated by the Pittsburgh Sleep Quality Index (PSQI) questionnaire. The 49.6% of the subjects who were good sleepers at the baseline reported a significant decrease in SQ after quarantine. Also, a significant increase in BMI values was noted among the participants in cohorts with normal weight, grade I and II obese. A significant decrease in PA was also reported in these cohorts, especially in males. In addition, smart working activity was reported to significantly worsen the SQ, particularly in males (Barrera, 2020).

A cross-sectional web-based online survey was carried out between 03 April 2020 and 18 April 2020 by Haddad C *et al* in the Lebanese population to evaluate the association between quarantine/confinement stressors and eating behavior during the COVID-19 outbreak between two groups of participants, those attending diet clinics and those not (general population). 407 participants were enrolled and the Eating Disorder Examination - Questionnaire (EDE-Q) was used to measure the behavioral features of eating disorders. The results showed that the fear of COVID-19 was correlated with more eating restraint, weight, and shape concerns in the whole sample, but more specifically in the dietician clients' group. It was suggested

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that public health control measures were needed to reduce the detrimental effects of psychological distress associated with quarantine/confinement on eating behaviors during the COVID-19 outbreak (Haddad, 2020).

Some recommendations were suggested by Abbas AM *et al* to live well and keep healthy during this pandemic (Abbas, 2020):

- Eating a well-balanced diet, focused on fruits, vegetables, whole grains, plant and animal protein, and healthy fats is the best way to get all the essential nutrients we need for good health and normal immune function.
- Good hydration is necessary for a healthy life. Plain water, beverages like coffee and tea or fresh juices are also suitable for hydration.
- Maintaining a routine daily activity schedule, such as regular mealtimes. This is necessary to control our hunger and meet our nutrient requirements. Turning off any devices that cause distractions such as TV, and mobile phones, and chewing food slowly while focusing on the smell and taste of food is essential.
- Minimizing the risk of foodborne diseases through ensuring food safety practices such as washing your hands for the 20s before preparing the food, cleaning the food items well, and disinfecting surfaces on which they are placed.
- Planning time for daily PA by taking regular breaks from sitting by standing up and walking or attending online exercise class activities (Nazari*et al*., 2020).
- Maintaining a regular schedule for sleeping is essential as SQ might be adversely affected by the stress due to the ongoing pandemic.

Objectives

1. To assess the changes in eating habits of adults during the COVID-19 pandemic.
2. To assess the changes in the lifestyle habits of adults during the COVID-19 pandemic.

Data and Methodology

The target population was the educated North Indian population irrespective of the rural or urban population. A sample of 400 was targeted keeping in mind the reach of the online questionnaire. Further, most responses were expected from the age group 18-45 years as this age group is more accustomed to the digital world. The socioeconomic status targeted was the middle to high class. This was further consistent with the medium of the survey questions being in English.

The survey was a cross-sectional survey and was conducted using online media. Google forms were used to build the online survey and the link to this survey was then disseminated using Facebook and WhatsApp to the target population.The questionnaire was developed keeping in view the common food preferences and lifestyle habits of the adult population aged between 18-65 years in North India during the pre-COVID era.The questionnaire assessed the changes in the intake of different food items (both from natural food sources and processed foods) to gauge the impact of pandemic on dietary habits. The response also includes information regarding the food habits altered by them to combat viral infection on the basis of already existing knowledge and the information they gained from the various print and digital media concerning the same.

There were questions about smoking and alcohol consumption habits. Given the pandemic situation, the questionnaire also gauged changes in the perception of individuals toward the consumption of these substances. With the motive to study the determination of individuals toward the benefits of regular exercise and other habits (like exposure to the sun), pertinent questions were included in the online questionnaire. To get an insight into the effect of this pandemic on the thorough process and the ability to cope with the stress due to this situation, the respondents were questioned about the change in their sense of hunger, sleeping habits and general well-being.

Results and Discussions

Sense of Hunger: As per the responses received, 69% (156) reported no change in their sense of hunger, 20% (46) reported an increase in hunger and 11% (24) reported a decrease in hunger. (Figure1).

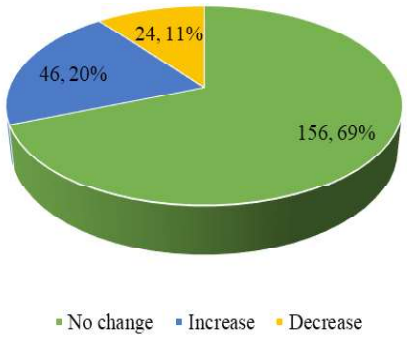

Figure 1: Change in the sense of hunger during the pandemic

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Frequency of Consumption of the Three Main Meals: The majority of the respondents (162, 72%) reported no change in this habit. Further, 36 (16%) did report an increase in the frequency of consumption of main meals and 28 (12%) reported a decrease. (Figure2).

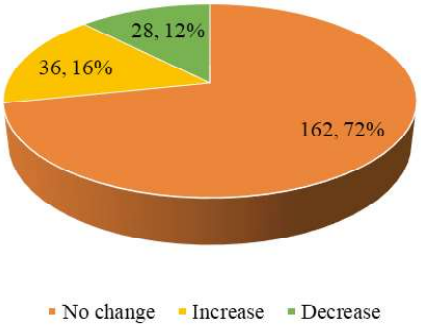

Figure 2: Change in the frequency of consuming the three main meals during the pandemic

Frequency of Consuming Home-Cooked Food: The majority of the respondents (130; 57%) reported an increase in the frequency of home-cooked food, 39% (88) respondents reported no change and 4% (8) reported a decrease in the frequency of consuming home cooked food. (Figure 3).

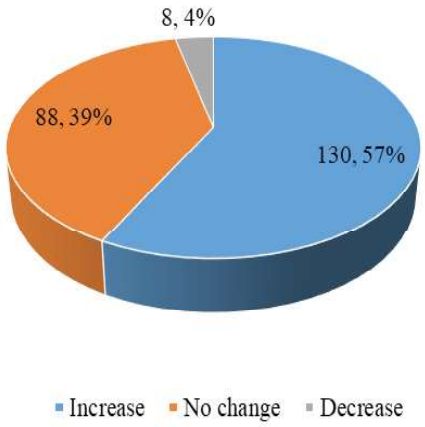

Figure 3: Change in the frequency of consuming home-cooked food during the pandemic

Frequency of home delivery/take away food orders: Based on the results

received, 68% (154) respondents reported a decrease in the frequency of ordering out, no change was reported by 30% (67) respondents and increased frequency was reported by 2% (5) respondents. (Figure 4).

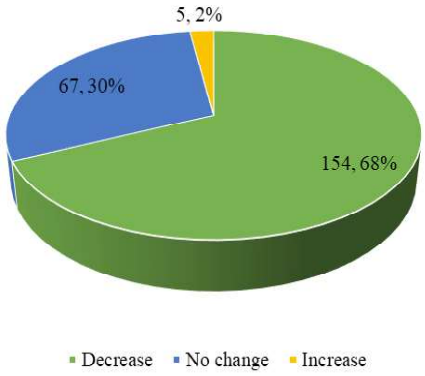

Figure 4: Change in the frequency of home delivery/takeaway food orders during the pandemic

Due to the closure of food outlets/street food outlets, a decrease was noted in the frequency of home delivery/takeaway food orders. This was consistent with the increased frequency of home-cooked food consumption during the pandemic.

Frequency of Consumption of Processed Food/Ready-to-eat Foods: Based on the results received, half (51%) of the respondents (114) reported a decrease in the frequency of consumption of processed food/ready-to-foods, no change was reported by 39% (89) respondents and increased frequency was reported by 10% (23) respondents. (Figure 5).

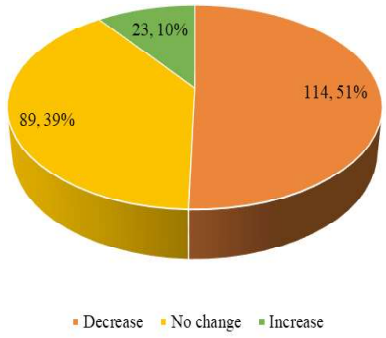

Figure 5: Change in the frequency of consumption of processed food/ready-to-eat foods during the pandemic

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Frequency of Snacking: Based on the results received, 39% (89) respondents reported an increase in the frequency of snacking, no change was reported by 32% (72) respondents and decreased frequency was reported by 29% (65) respondents. (Figure6).

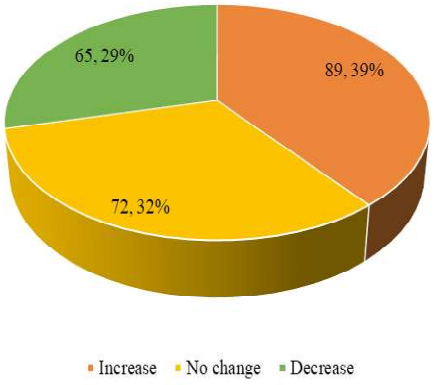

Figure 6: Change in the frequency of snacking during the pandemic

Water/Liquid Intake: Based on the results received, 48% (109) respondents reported an increase in water/liquid intake, no change was reported by 40% (91) respondents and decrease was reported by 12% (26) respondents. This segregation is presented in(Figure7).

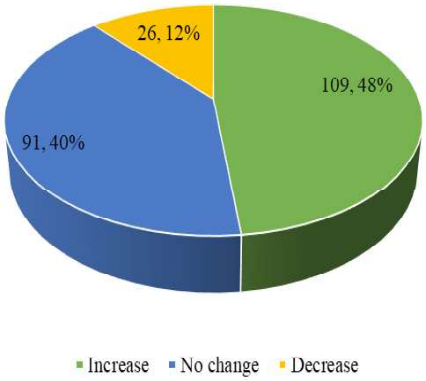

Figure 7: Change in the water/liquid intake during the pandemic

Consumption of Carbonated Drinks: Based on the results received, 47% (107) respondents reported a decrease in consumption of carbonated drinks, no change was reported by 43% (97) respondents and 10% (22) reported an increase in the intake of carbonated drinks. (Figure 8).

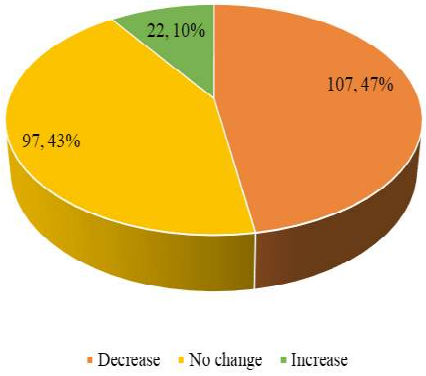

Figure 8: Change in the consumption of carbonated drinks during the pandemic

Consumption of fruits and vegetables: Based on the results received, 48% (109) respondents reported an increase in fruit consumption, 38% (85) respondents reported no change and decreased consumption was reported by 14% (32) respondents. (Figure 9).

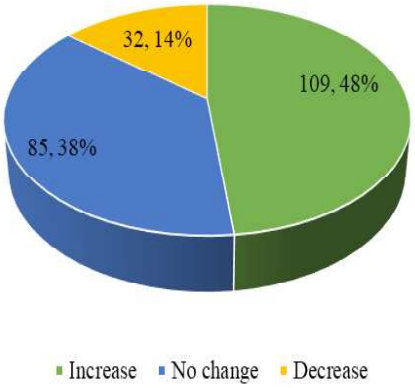

Figure 9: Change in the consumption of fruits during the pandemic

With regards to vegetables, 51% (115) of respondents reported an increase in consumption, 42% (94) respondents reported no change and 7% (17) reported a decrease in consumption (Figure 10).

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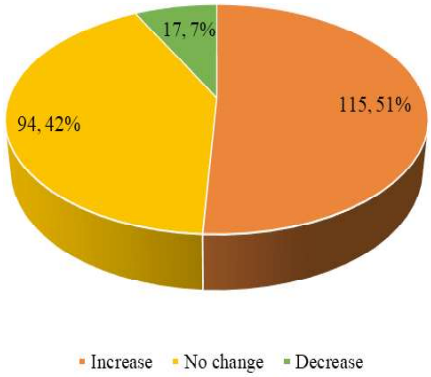

Figure 10: Change in the consumption of vegetables during the pandemic

Consumption of cereal and pulses: Based on the results received, 57% (129) respondents reported no change in consumption of cereals, 31% (71) respondents reported an increase and 12% (26) respondents reported a decrease in consumption of cereals and cereal products. (Figure 11).

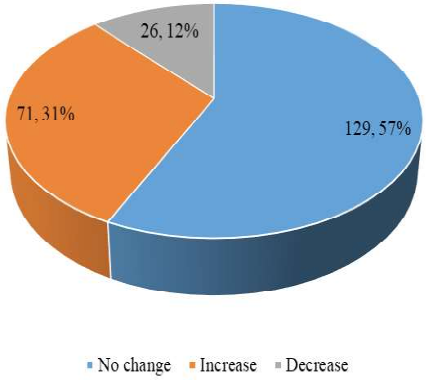

Figure 11: Change in the consumption of cereals and cereal products during the pandemic

With regards to pulses, 58% (132) respondents reported no change, 39% (88) respondents reported an increase and 3% (6) reported a decrease in the consumption of pulses during the pandemic. This segregation is presented in Figure 12.

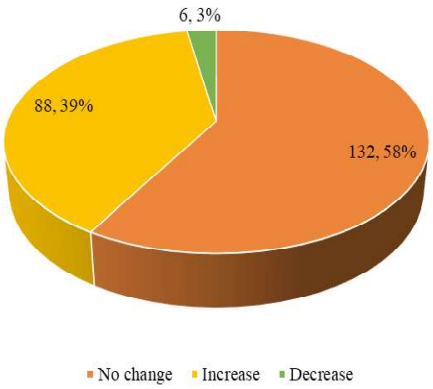

Figure 12: Change in the consumption of pulses during the pandemic

Consumption of Milk and Milk Products: Based on the results received, 52% (117) respondents reported no change in consumption of milk and milk products, 40% (91) respondents reported no change and 8% (18) respondents reported a decrease. (Figure 13).

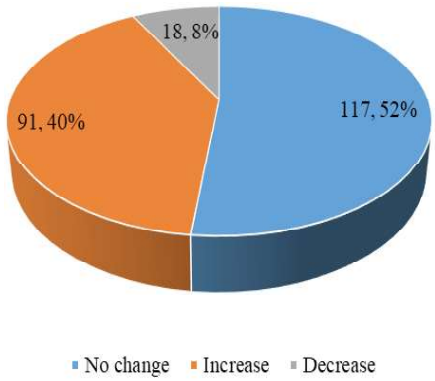

Figure 13: Change in the consumption of milk and milk products during the pandemic

*Consumption of Non-vegetarian Food (Eggs, Meat and Meat Products):*Based on the results received, 70% (159) respondents reported no change in consumption of eggs, 17% (38) respondents reported a decrease and 13% (29) respondents reported an increase. (Figure14**)**.

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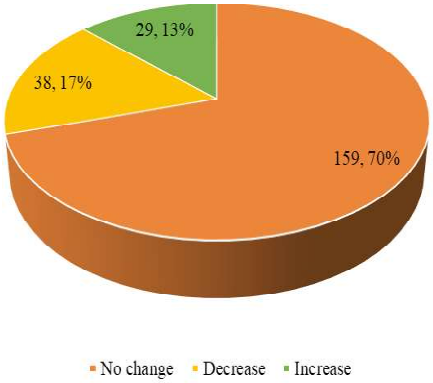

Figure 14: Change in the consumption of eggs during the pandemic

With regards to meat and meat products, 65% (148) respondents reported no change, 27% (61) reported a decrease and 8% (17) respondents reported an increase in consumption of meat and meat products. (Figure 15).

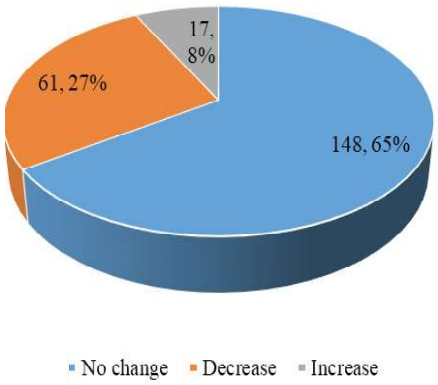

Figure 15: Change in the consumption of meat and meat products during the pandemic

*Consumption of Nuts:*Based upon the responses received, 64% (144) respondents reported no change, 27% (61) respondents reported an increase in consumption and 9% (21) reported a decrease in consumption of nuts during the pandemic. (Figure 16).

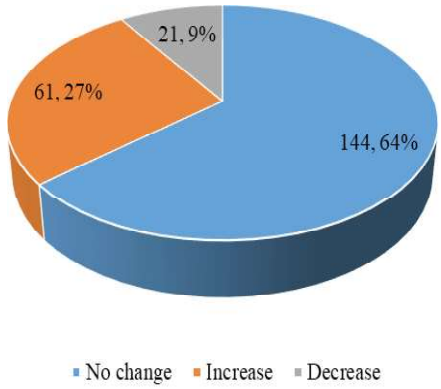

Figure 16: Change in the consumption of nuts during the pandemic

*Consumption of fats:*Based upon the responses received, 63% (142) respondents reported no change, 29% (65) respondents reported an increase in consumption and 8% (19) reported a decrease in consumption of fats during the pandemic. This has been presented in Figure 17.

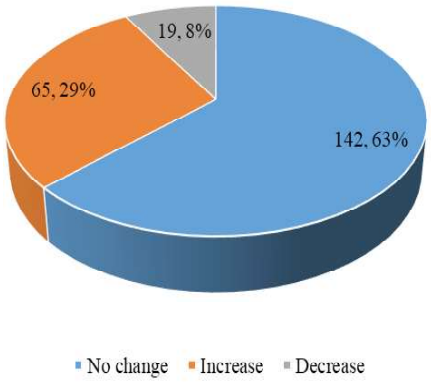

Figure 17: Change in the consumption of fats during the pandemic

*Consumption of sweets/desserts:*Based on the responses received, 43% (96) of respondents reported no change in consumption of sweets/desserts. Seventy-three (73; 32%) respondents reported a decrease and 25% (57) reported an increase in the consumption of sweets/desserts. (Figure 18).

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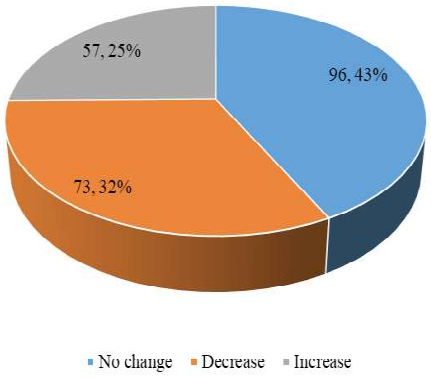

Figure 18: Change in the consumption of sweets/desserts during the pandemic

Immunity-boosting food items: In the absence of a definitive cure or vaccine for the deadly/debilitating disease, much emphasis was laid on improving/maintaining good levels of immunity for each individual and the mankind overall. As an outcome, everyone turned to the good old Ayurvedic herbs and preparations for improving the immunity.

Based on the results received, approximately half of the respondents (46%; 105) included an immunity booster food in their diet during the pandemic while no such addition was reported by 54% (121) respondents. (Figure 19).

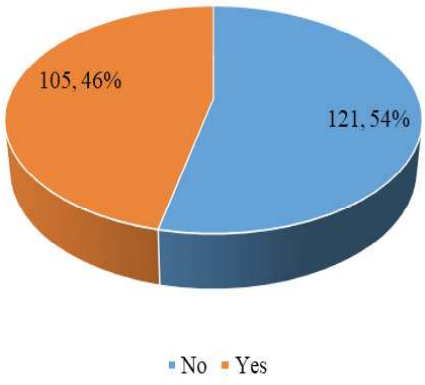

Figure 19: Immunity-boosting food item added to daily food list during the pandemic

Smoking Habits: The majority of the respondents were non-smokers prior to the start of the pandemic and continued the same during the pandemic as well. Smoking cessation was reported by 8% (18) respondents and a decrease in frequency was reported by 3% (6). One respondent did report developing habit of smoking. (Figure 20).

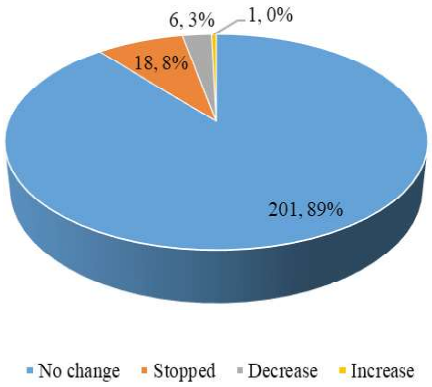

Figure 20: Change in smoking habits

Drinking habits: The majority of the respondents (81%; 183) continued their same routine with regard to alcohol consumption during the ongoing COVID pandemic. A decrease in the consumption was reported by 9% (21) and 8% (19) reported cessation of their drinking habit. An increase in alcohol consumption was reported by 1% (2) respondents and 1 respondent reported started drinking during the pandemic. (**Figure 21).**

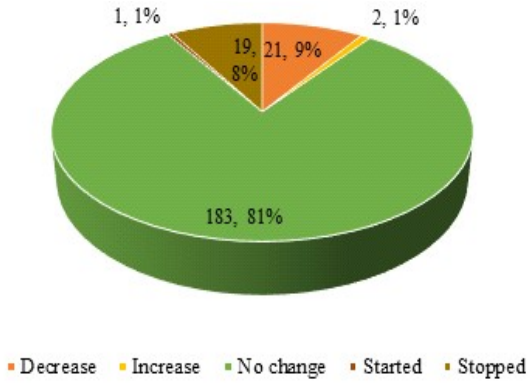

Figure 21: Change in drinking habits

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Exposure to Sun: Vitamin D has a modulatory effect on the innate and the acquired immunity. It affects the functioning of the B cells, T cells and antigen-presenting cells – all of which are responsible for the immune responses in the body. Based upon the results received, 52% (117) respondents reported a decrease in the exposure to the sun, no change was reported by 38% (87) and an increase in sun exposure was reported by 10% (22) respondents. It has been presented in Figure 22.

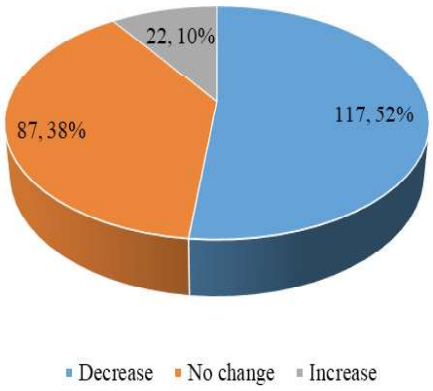

Figure 22: Change in the exposure to the sun during the pandemic

Exercise Routine: Physical exercises have an immunomodulatory effect. Based upon the results received, an increase in exercise was reported by 35% (78) respondents, 33% (75) respondents reported a decrease and 32% (73) reported no change in exercise routine. (**Figure 23).**

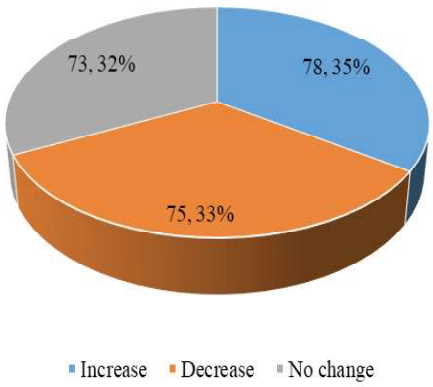

Figure 23: Change in an exercise routine during the pandemic

Sleep Patterns: Sleep is the time when the body heals, rejuvenates, enhances the immunity, repairs itself, and rewinds, so that the individual is ready to start another day with the same zealBased on the responses received, no change in sleep pattern was reported by 47% (107) respondents, 29% (65) reported an increase and 24% (54) respondents reported a decrease in sleep during the pandemic. (Figure 24).

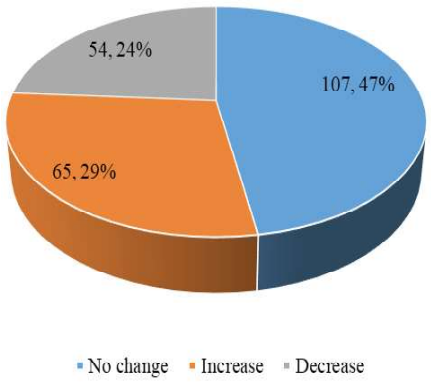

Figure 24: Change in sleep patterns during the pandemic

Summary and Conclusion

The study concluded that the pandemic has affected eating and lifestyle habits. In the absence of any definitive treatment and vaccine, emphasis was laid on moving back to the Indian roots – home-cooked food, consumption of a balanced diet, the inclusion of ayurvedic preparations, exercise, sleep, and maintaining a healthy work-life balance.

With regards to the dietary changes, people did shift from food prepared in the food service establishments to home-cooked food. A decreasing trend in the consumption of processed food was also noted. Positive changes included increased water intake, and consumption of fruits and vegetables, milk, cereals, pulses and nuts. Negative impacts included the consumption of sugary and concentrated sources of energy (fatty foods and sweets/desserts). Further, the respondents also altered their daily food items by adding and removing some foods. The most common foods added were immunity-boosting foods with an inclination towards ayurvedic preparations.

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COVID-19 has created awareness of the importance of a healthy body. Decrease/cessation of smoking and drinking habits, and increase in sleep and exercise time were some note-worthy findings. An improved overall health and a decrease/ no change in weight were some of the positive changes that came across by this survey.

This survey did have limitations. The survey was conducted via an online mode, hence, not all ages did not have an equal representation. This could be attributed to the "digital divide". Further, the state-wise representation was also not proportionate. Finally, we could not evaluate the impact of lockdown on different population sub-sets, sub-analyzing, e.g., by age, gender, and employment status, which would be important to better target future public health initiatives.

In conclusion, this was some initial evidence of the dietary and lifestyle habits during the COVID-19 pandemic leading to the lockdown. Large-scale studies would be needed in India and worldwide for the preparedness and public health initiatives needed to be ready for any further pandemics.

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