Changes in Eating Habits of Young Adults Before and During Covid-19 Lockdown: A Survey

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ABSTRACT

COVID-19 has drastically changed the lifestyle of people worldwide and routines have been modified. This survey is focused on understanding the changes in the physical and mental health as well as eating habits of the young adult population in Kerala, owing to the first wave of the pandemic induced lockdown; and compares it with the pre-lockdown conditions. A total of 616 volunteers participated in the study. It was conducted using online questionnaires circulated among young adults in the age group of 18-35, where 91.2% participants belonged to the first age group of 18-25 years. Participants responded to multiple choice and short answer questions on their lifestyle changes during the lockdown (March-July, 2020). Statistical analysis was done to evaluate the significance ($p<0.05$). The results depicted lesser consumption of restaurant and street foods. Meal consumption was more orderly compared to the pre-pandemic situation. Though, there was a hike in the amount of snack consumption (23%) and frequency (10%) during this period, there was trend towards consumption of fresh fruits from 29.7 to 37.6%. Similarly, preference for salty packaged snacks decreases from 62.6% to 32.1%. People opined that more time was spend on work-out and to stay fit, indicating the importance of healthy life-style. Preference for immune boosting foods, organic farming and organic foods, also showed an increase. However, the study group informed that the anxieties and mental stress increased during lockdown.

Keywords: COVID-19; First-Wave; Pandemic; Young Adults; Food.

1. INTRODUCTION

The COVID-19 pandemic started affecting the world in the month of December 2019, believed to have originated in the Wuhan district of Hubei province in China. The pandemic spread across several countries and took millions of lives. In India, the first positive case was reported on 30th January 2020, after which it spread to many across the country. Reporting to the hike in cases, the Government of India implemented a nation-wide lockdown on March 25th that extended to 2 months [1]. On April 22nd, India had reported 18,985 positive cases and 603 deaths. Later, on July 15th, 2020 the rates increased to 968117 positive cases and 24915 deaths [2]. Nevertheless, it should be noted that 65% of the Indian population are aged lesser than 35 years [3].

The purpose of this survey is to analyze the changes in the food habits of young adults during the first phase of COVID. The survey was conducted during March to July, 2020. A total of 616 people between the age group of 18-35 years participated in the study. Participants responded to multiple choice and short answer questions on their lifestyle changes during the lockdown and statistical analysis was done to evaluate the significance.

2. LITERATURE REVIEW

The first waves of the Corona virus followed by the nation-wide lockdown has not only affected the day-to-day and economic life but have also affected the physical and mental state of several. Studies based on the mental and physical health of the population were conducted by several scientists. In diabetic patients, it showed reduced workout rate, increased carbohydrate consumption and increased mental stress [4]. Another study depicted stress and depression in some people following the lockdown and fear of getting infected [5]. An Italian survey on changes in eating habits proved that many have decided to shift to a healthier diet and lifestyle [6], whereas, a similar study in the UAE [7] and China [8] showed increased weight gain due to inactivity and unhealthy dietary patterns. However, in countries like Qatar, people have shifted to healthy eating, worked upon their culinary expertise, resorted to domestic food products and are devoid of panic buying [9]. Another study has revealed that almost one-third of the tested adolescent and adult population experienced an increase in snack and alcohol consumption, but a decline in the procurement of online or fast foods was observed [10].

Additionally, it was observed that improving the immune system could be an alternative to overcome the current situation. A study emphasized the importance of green foods or plant foods and its role in contributing to the immunity in all aged groups. Antioxidant glutathione, polyphenol (quercetin), plenty of fluid (water), micronutrients (magnesium, zinc), herbs and foods rich in vitamin C, D and E, also aid in immunity development [11]. A similar study among people living in the Benha city of Egypt produced results stating that people started using immune boosters and immunomodulators such as, medicinal plants, honey, garlic, vitamin C, D and zinc supplements during the pandemic [12]. An Italian survey with 456 consumers showed that the lockdown induced psychological pressures that has led to impulsive approaches on food purchase; and which, is supposed to come back to normal conditions once the pandemic has subsided [13].

The shutting down of educational institutions, offices and public services as a means of social distancing and preventing the spread of disease, has considerably transformed the lives of the young and adult population. This study focuses on the changes in food habits, physical and mental health of the young Indian population during the first wave of the COVID-19 pandemic. The age groups included 18-25 and 26-35, which include a higher number of students and work force. All the young populations of the country have now resorted to learning or work from home techniques. They have to rely on virtual platforms and continuously sit without any physical activities unlike the situation in an office or a college. This will definitely have an impact on the physical and mental health as well as change the eating habits in them. The study was conducted using an electronic questionnaire which contained queries regarding eating habits, exercise, diet routines and mental health. The specific objectives of the study include preparation of an electronic questionnaire on eating habits, exercise, diet routines and mental health, to spread it across people of the desired age category and to compute the results and draw an appropriate conclusion.

3. REVIEW

3.1 Participants:

This study was basically carried out in order to cognize the food habits of the youth before and during the first wave of the COVID-19 pandemic in India that lasted from March 2020 till September 2020. The survey that we conducted contains statistics from March to July 2020. There were a total of 616 participants that belonged from various parts of India for this study. Inclusion criteria were: a) 18-25 years and b) 26-35 years. Participants were also allowed to give a brief-feedback if any.

3.2 Self Report Measures:

Information was collected by electronic survey designed by our own team uploaded to Google Forms platform and was piloted by 3 other people in order to evaluate any unforeseen circumstances occurring during the question formation and response collection. Once the survey was designed and tested, it was sent via social media platforms like Whatsapp, Facebook, and Instagram on 26th and 27th July 2020 respectively (i.e., for 2 days). The survey was based into different sections like personal information, personal history, food habits and physical activity patterns.

3.2.1 Study Presentation:

The target groups were asked to reply to the questions faithfully and honestly. Most of the questions were compulsory and the responses were accepted and considered in data processing by the research team only when “submit” was selected.

3.2.2 Personal History:

The first section of the survey included questions on personal information: like Name, age, sex, profession (student, teacher,

private sector or looking for a job), mode of work, health issues if any, and place of stay.

3.2.3 Food Habits:

Questions on frequency and consumption of meals before and during the lockdown were asked. Questions like preference of meal, frequency of consumption of meal, time of consumption of breakfast, lunch and dinner, mode of food preparation, frequency of snack consumption, preference of snacks and liters of water consumed were asked in both the sections, also, consumption of immune boosting foods if any, during the lockdown.

3.2.4 Physical Activity and Mental Health:

Questions on the availability of time to stay fit before and during lockdown, type of physical activity done, state of physical fitness and state of mental health were asked.

3.3 Data Analysis:

Repeated measures ANOVAs (Analysis of Variance) were administered for all the outcomes with an independent variable of time (before/during lockdown) and were represented as tables, bar graphs and pie charts in results, scrutinized and enunciated in the discussion.

4. RESULT

This report presents the data from an online survey comparing the food habits in young adults before and during the COVID-19 pandemic. This survey was conducted for the period from in the month of July, 2020 during the first phase of lockdown, among young adults in the age group 18-35. There were 616 responses. The table below (Table-1) shows the general information of the participants.

It is clear that majority of the tested population belongs to the 18-25 age group, where most of them are students, followed by private sector employees, job seekers and teachers. The number of female respondents is double than that of males. It is also important to note that about 69.5% of the participants were working from home during the conduct of the online survey.

4.1Changes in Living Status:

The changes in the living status of the young population during the lockdown are depicted in (Figure-1). There was a drastic change in the living status of participants during the first wave of the pandemic and the lockdown induced thereafter. During the pandemic, most of the people, i.e., 94 % were living with family and only 6% were living with friends.

Table-1: General Information of Participants

Sample demographics	Number of participants (Total n = 616)
Age (years)	
18-25-	562 (91.2 %)
26-35-	54 (8.8 %)
Gender	
Male-	207 (33.6 %)
Female-	406 (65.9 %)
Prefer not to say	3 (0.5 %)
Profession	
Student	469 (76.1 %)
Teacher	14 (2.3 %)
Private sector	67 (10.9 %)
Looking for job	66 (10.7 %)
Working status	
Work from home	137 (69.5 %)
Work from office	60 (30.5 %)

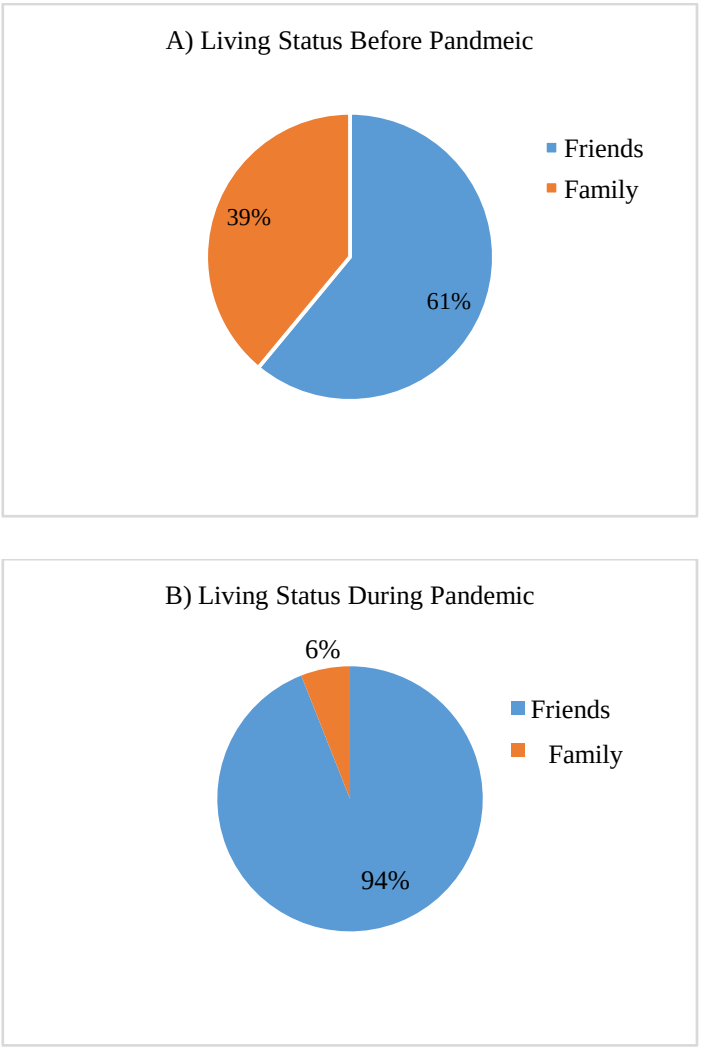

Figure-1: A) Living Status Before Pandemic & B) After the Pandemic (March-July, 2020)

4.2 Changes in the Mode of Food Procurement:

The changes in the mode of food procurement among the young population during the lockdown are depicted in (Figure-2). Before pandemic, 20.8 % preferred outside food and during pandemic it was reduced to 0.8 %. Also, preference for home-made food was increased from 79.2 % to 99.2 %.

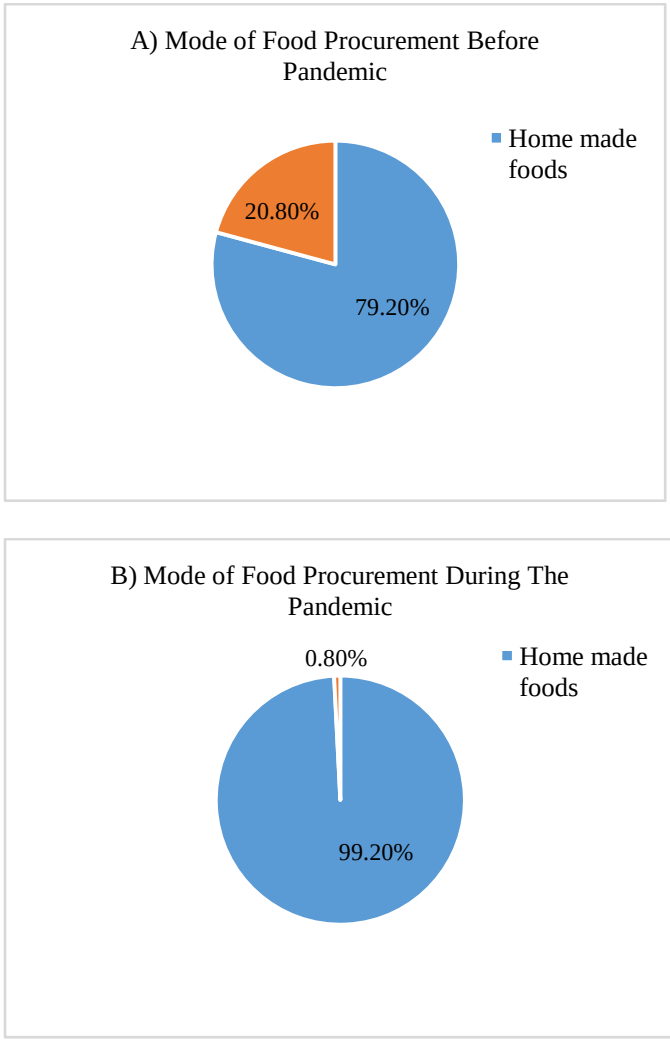

Figure-2: Mode of Food Procurement: A) Before & B) During the Pandemic (March-July, 2020)

4.3 Changes in Eating Habits:

Majority (57.8%) have indicated a notable change in eating habits during the pandemic induced lockdown period (Figure-3). Further, the main changes in eating habits have been reported in terms of changes in timing of meal consumption (39.1%) as well as increase in the amount of food consumed (32.3%) (Figure-4).

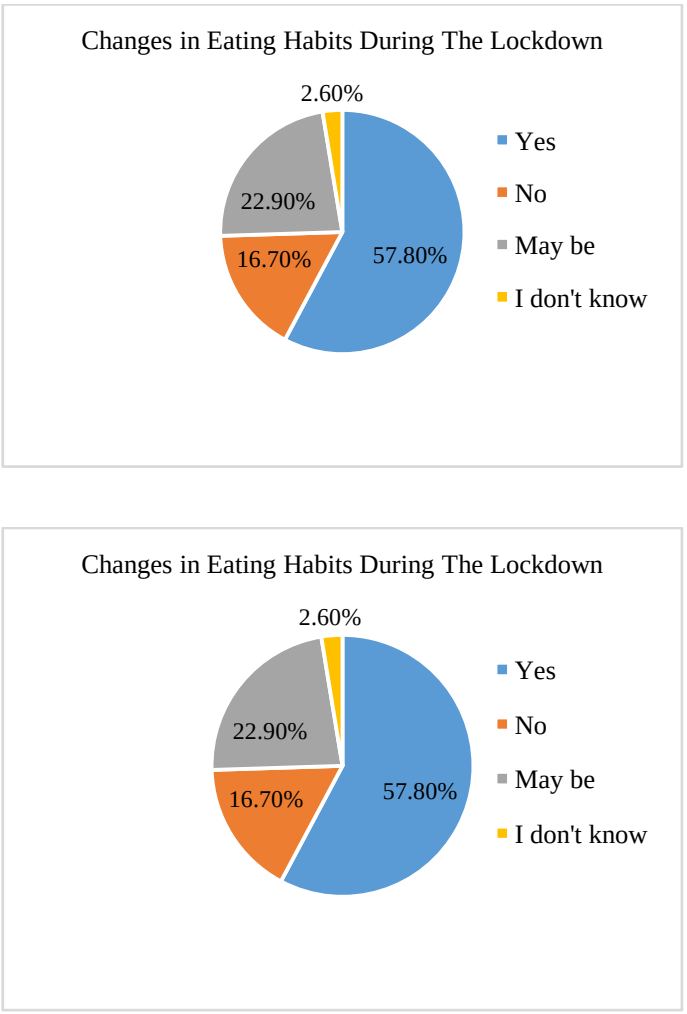

Figure-3: Changes in Eating Habits During the Pandemic Induced Lockdown (March -July, 2020)

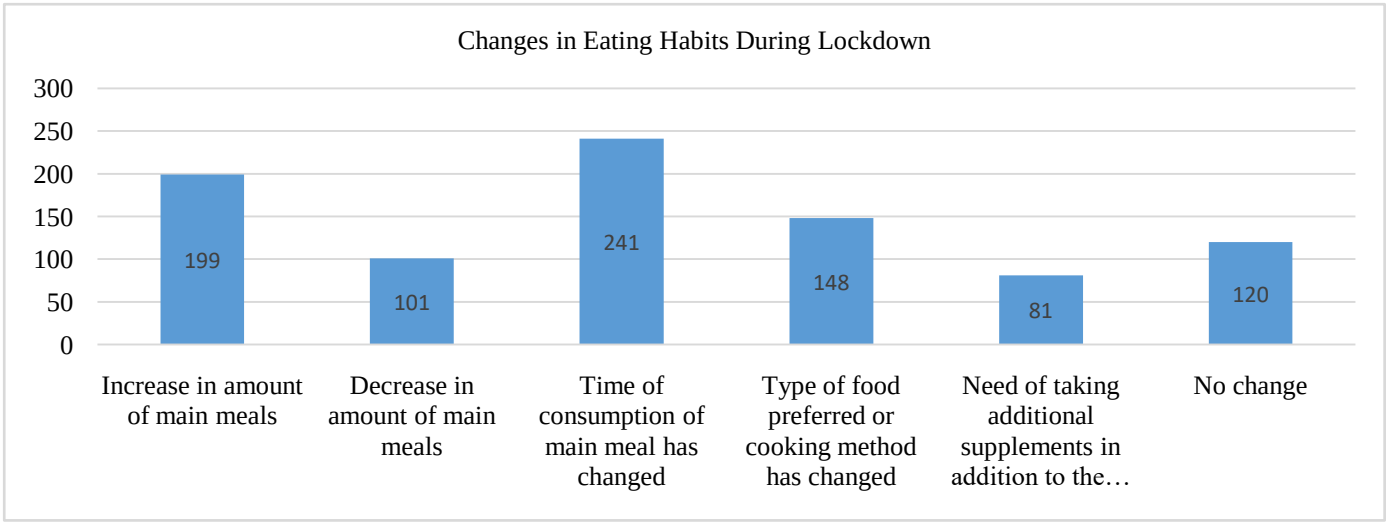

Figure-4: Changes in Eating Habits During The Pandemic Induced Lockdown (March -July, 2020)

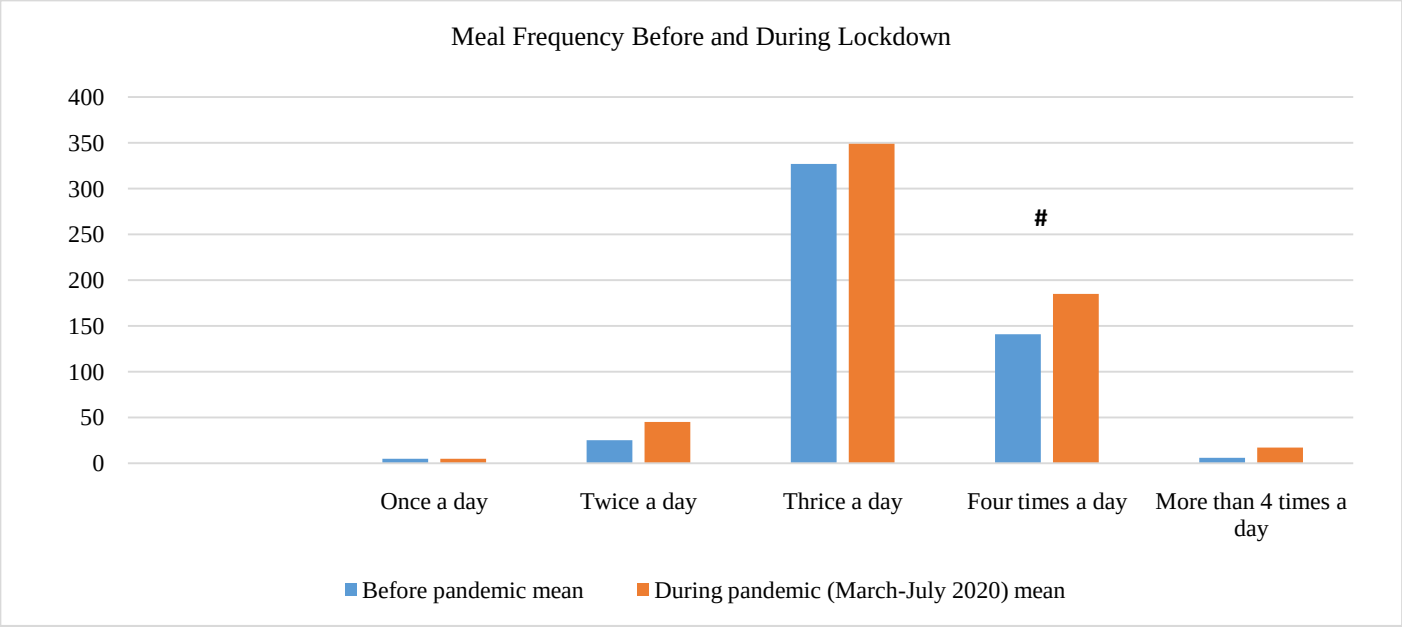

Figure-5: Meal Frequency Before and During the Lockdown (March -July, 2020) # - Significant Increase, P < 0.05

4.4 Changes in the Frequency of Meal Consumption:

Changes in the consumption of meals during lockdown following the pandemic from the month of March to July are depicted using ANNOVA analysis in the table below (Table-2). The frequency of meal consumption has slightly increased during pandemic as compared to before (Figure-5). Most people preferred consumption of meals thrice a day both before as well as during the pandemic.

4.5 Changes in the Type of Foods Consumed:

Changes in the types of foods consumed during lockdown following the pandemic hit from the month of March to July is depicted using ANOVA analysis in the table below. (Table-3) (Figure-6). The preference for packaged foods and online delivered foods has decreased drastically from 14.1 % to 5.8 % and from 19.2 % to 5.8 % respectively.

Table-2: Changes in Frequency of Meal Consumption

Frequency of meal consumption	Before Pandemic	During pandemic (March-July 2020)	F	p
	Mean	Mean		
Once a day	5	5	0	1
Twice a day	25	45	2000	< 0.00001
Thrice a day	327	349	2420	< 0.00001
Four times a day	141	185	9680	< 0.00001
More than 4 times a day	6	17	605	< 0.00001

Table-3: Changes in Type of Foods Consumed

Types of Foods	Before Pandemic	During Pandemic (March-July 2020)	F	p
	Mean	Mean		
Packaged foods	87	36	13005	< 0.00001
Online delivered or pre- prepared foods	118	36	33620	< 0.00001
Vegetable dishes	296	279	1445	< 0.00001
Animal based foods	295	201	44180	< 0.00001
Sautéed and fried foods	236	218	1620	< 0.00001

Note: F- Probability Distribution, P – Probability Value

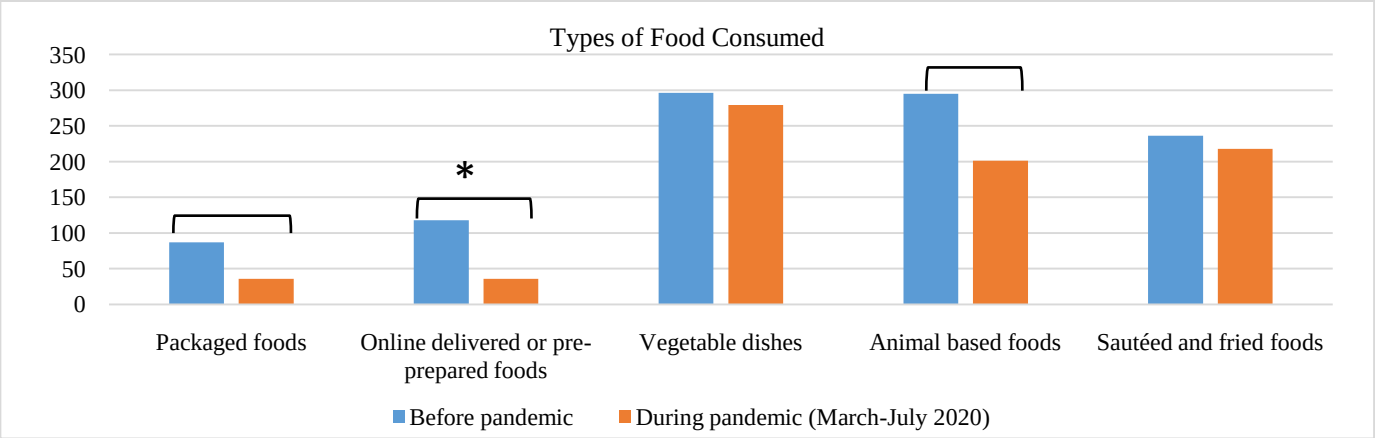

Figure-6: Types of Foods Consumed Before and During the Lockdown (March -July, 2020) * Significant Decrease, P < 0.05

The preference for animal or meat-based preparations had reduced from 47.9 % to 32.6 %. However, there was a high preference for foods prepared by boiling/ steaming / grilling methods during the lockdown.

4.6 Changes in the Timing of Food Consumption:

The timing of food consumption has also changed during pandemic as 51.5 % reported a proper routine, 43.8 % reported a bad food routine, compared to the situation before the pandemic (Figure-7).

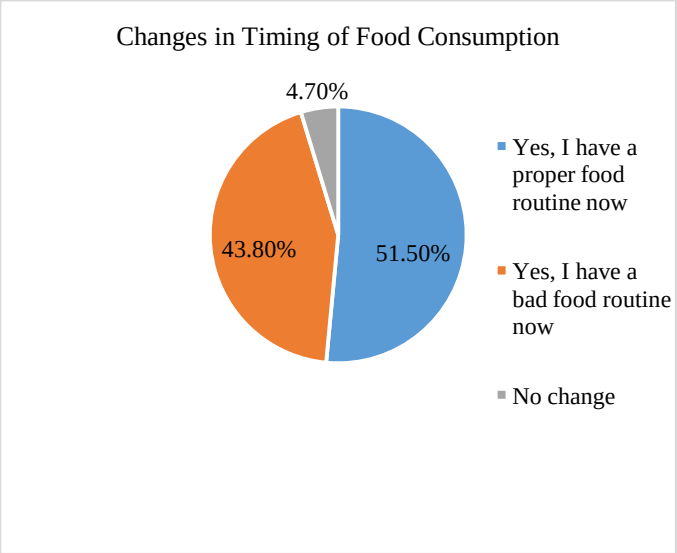

Figure-7: Changes in Timing of Food Consumption During the Lockdown (March-July, 2020)

4.7 Changes in the Consumption of Snacks:

The amount of snack consumption has also reported changes during the lockdown. The results are illustrated in the figure below (Figure-8).

29.7 % reported an increase in snack consumption during pandemic and 27.3 % reported a decrease in snack consumption. Regarding the frequency of snack consumption, 3.8 % reported an increase whereas 11 % reported a decrease in the frequency of snack consumption.

4.7.1 Changes in the Types of Snacks Preferred:

Changes in the types of snacks preferred during the lockdown following the pandemic from the month of March to July are depicted using ANOVA analysis in the table below (Table-4) (Figure-9). It is positive to note that 37.6% have opted for fresh fruits as a snack option during the pandemic compared to the pre-pandemic situation (29.7%). Similar increase is observed in the consumption of nuts and vegetable salads. Moreover, preference for salty and packaged snacks has reduced from 62.6% to 32.1%.

Table-4: Changes in Type of Snacks Preferred

Type of snack	Before pandemic	During pandemic (March-July 2020)	F	p
	Mean	Mean		
Salty and packaged foods like chips	386	198	176720	< 0.00001
Cakes, pastries, wafers, biscuits	319	189	84500	< 0.00001
Desserts like puddings	91	84	245	< 0.00001
Nuts	111	128	1445	< 0.00001
Fresh fruits	183	232	12005	< 0.00001
Fresh fruits/vegetables preparations	53	196	102245	< 0.00001
None	28	62	5780	< 0.00001

Note: F- Probability Distribution, P - Probability Value

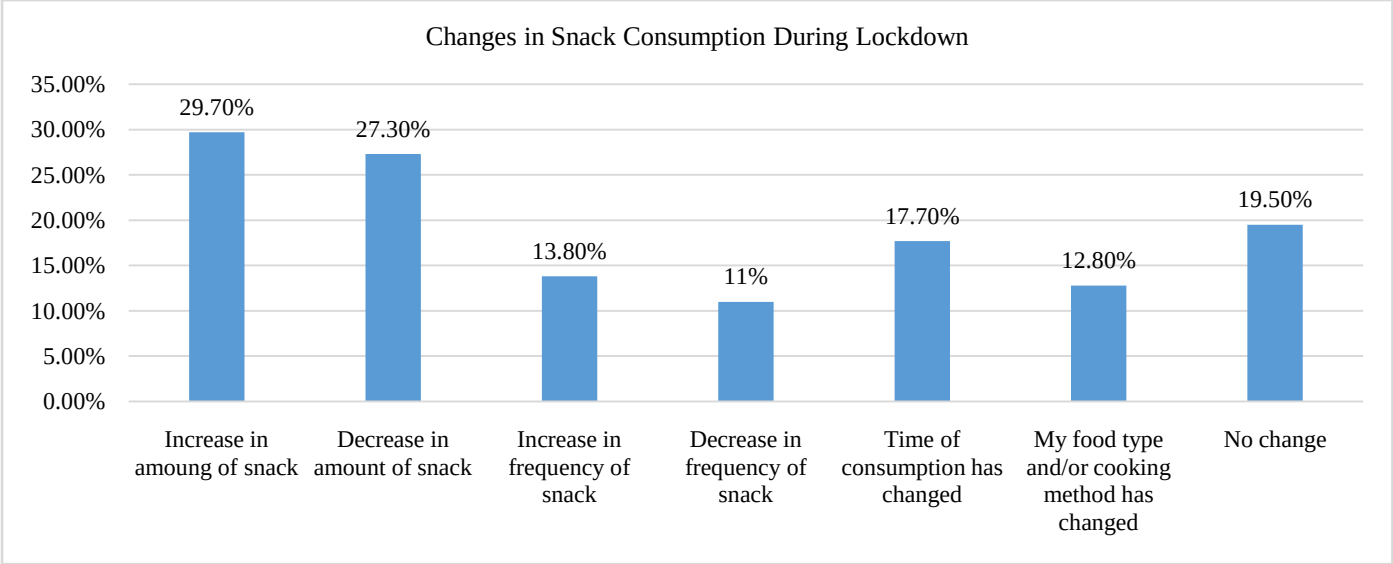

Figure-8: Changes in Snack Consumption During The Lockdown (March-July, 2020)

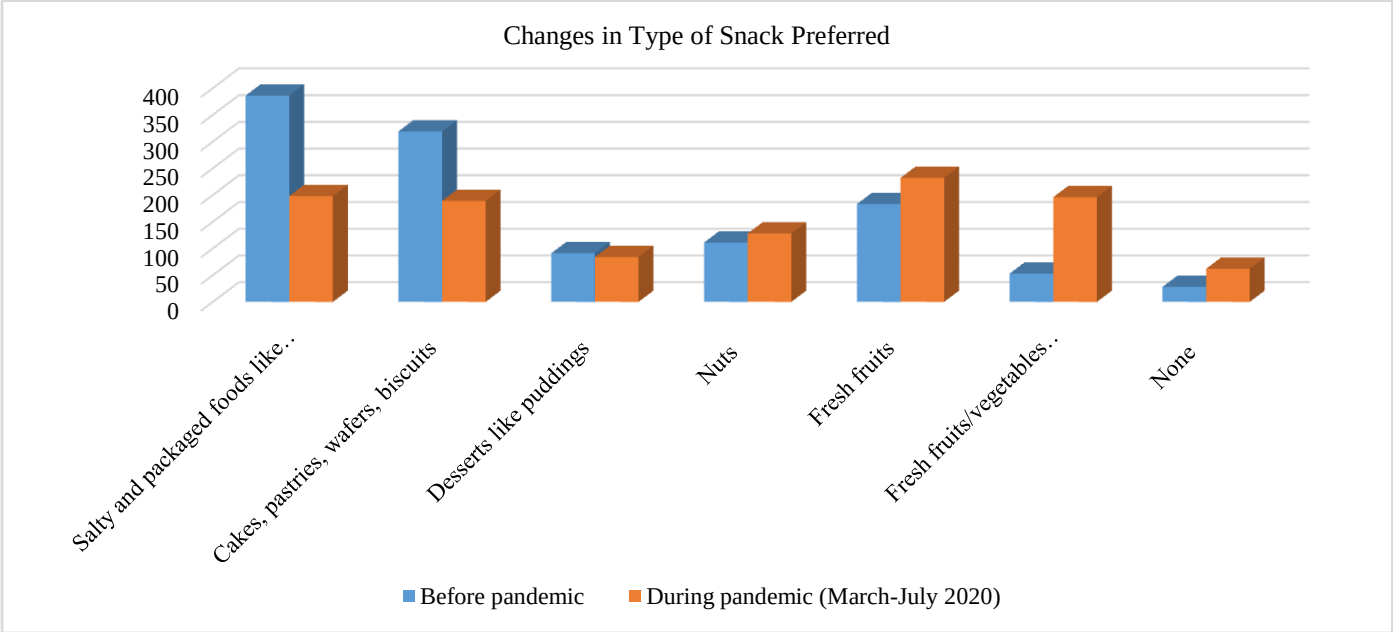

Figure-9: Changes in Snacks Preferred Before and During the Lockdown (March-July, 2020) # - Significant Increase; * Significant Decrease, P < 0.05

4.8 Changes in the Consumption of Water:

The differences in consumption of water before and during the pandemic of March to July, 2020 are illustrated below in (Figure-10)**.** Most people in the target group are not concerned about the water intake as the time period before and after the pandemic is concerned. It is seen that most of them are of the practice of consuming 2 liters of water daily under both the cases. There has been an increase in the number of people who drink 4 liters or more water per day during the lockdown.

4.9 Changes in Physical Health:

A 6 % increase in the availability of time to look after physical fitness was observed among the target population during the pandemic induced lockdown, as depicted in the figure below (Figure-11). Among the fitness measure adopted, most of them (56%) opted for miscellaneous exercises followed by walking (23.7%), yoga (15.1%) and Zumba (5.2%) (Figure-12**).** Most people reported an increase in the availability of time for weight management during the lockdown. 40.3 % reported a normal weight management, 28.1 % reported a better weight management and 11.5 % reported a decline in weight management during pandemic (Figure-13).

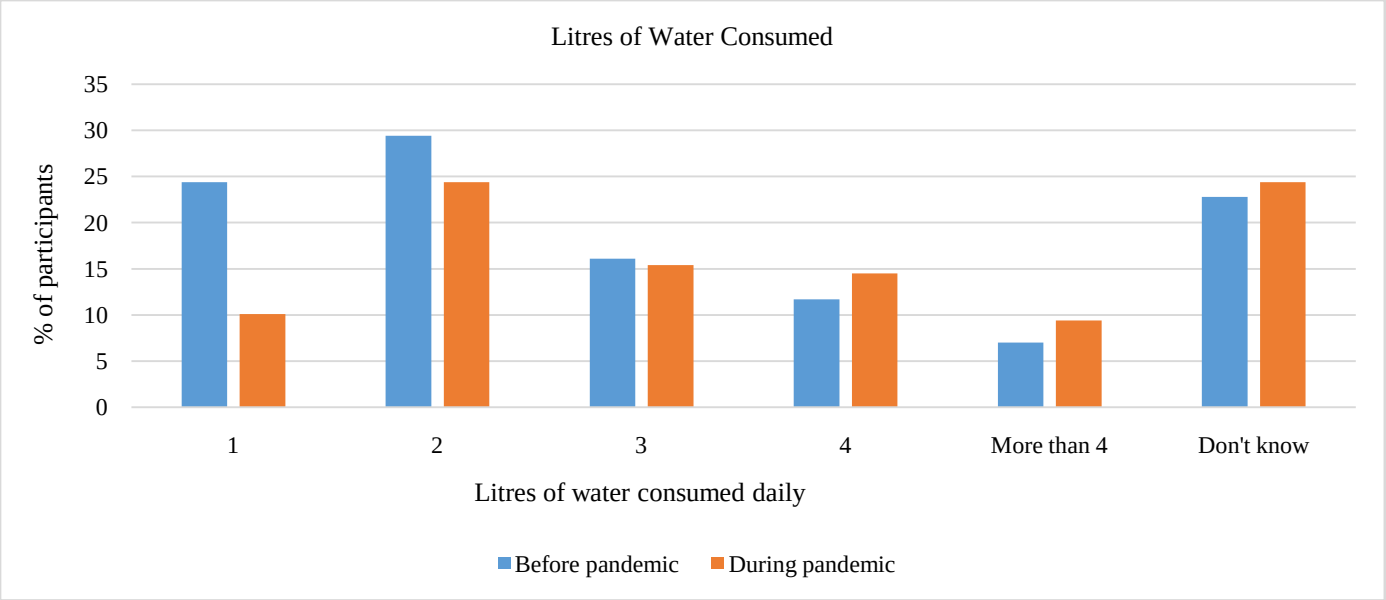

Figure-10: Differences in Water Intake Before and During the Lockdown (March-July, 2020)

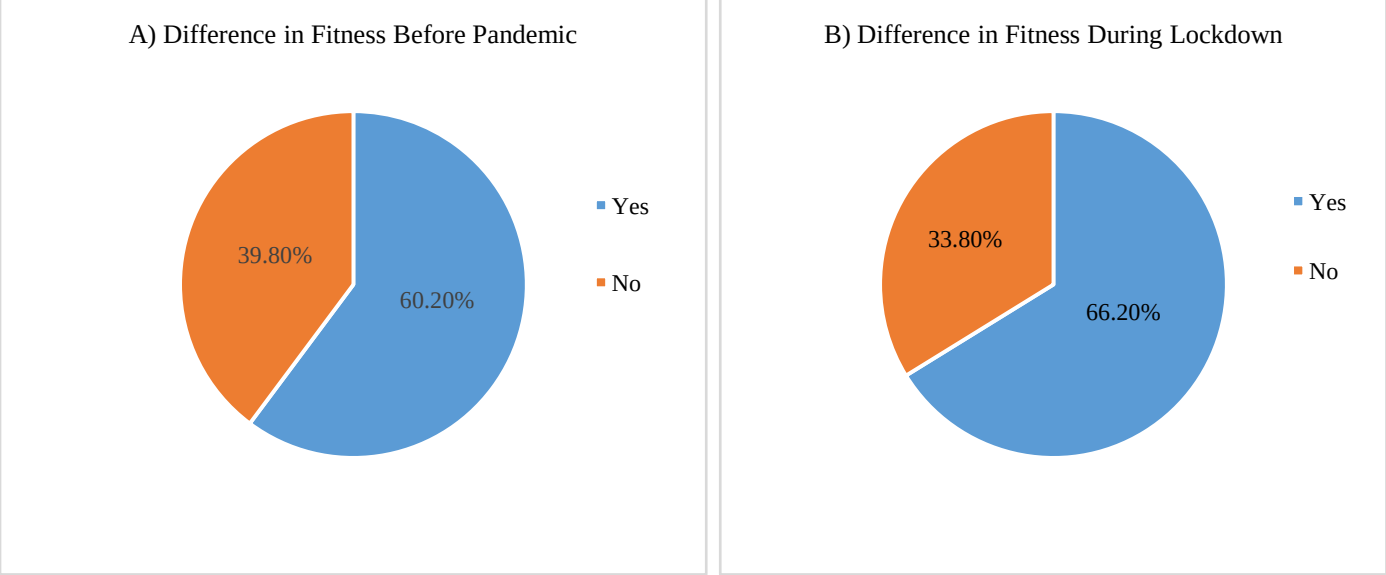

Figure-11: Differences in Fitness Measures: A) Before And B) During the Lockdown (March-July, 2020)

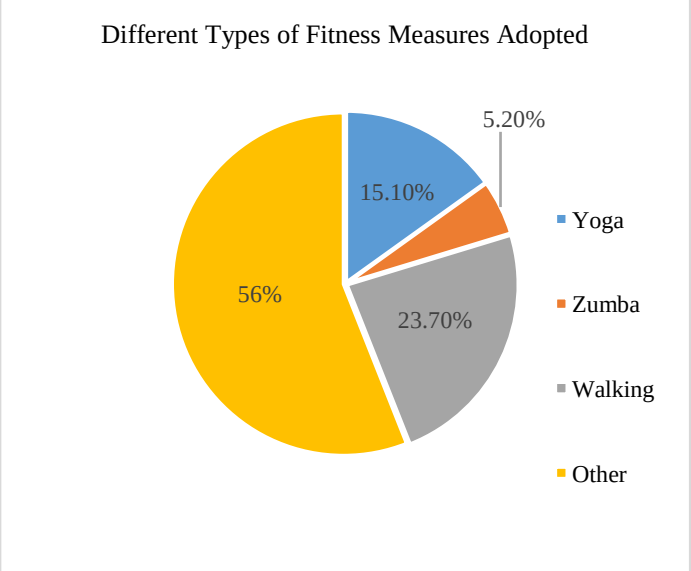

Figure-12: Different Fitness Measures Adopted During the Lockdown (March-July, 2020)

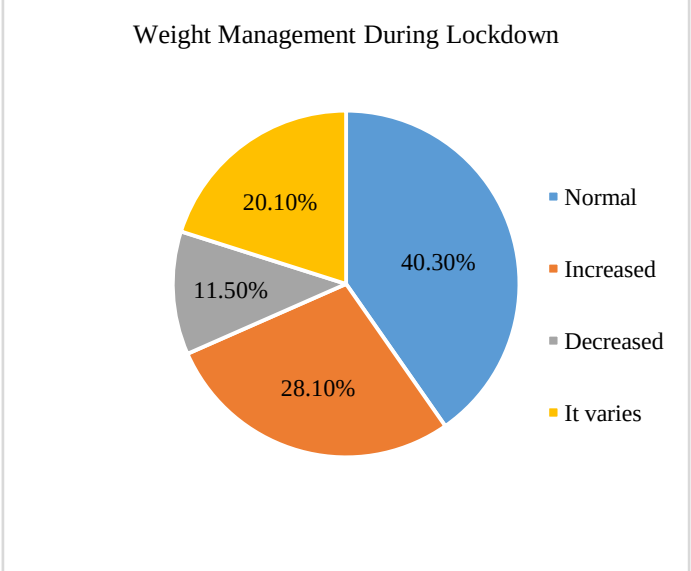

Figure-13: Weight Management During the Lockdown (March-July, 2020)

4.10 Role of Immune Boosting Foods:

It is reported that 48.2 % of the target population tried immune boosting foods purposefully during the pandemic (Figure-14). And, most people preferred citrus fruits, ginger, turmeric, garlic, etc. as immune boosters.

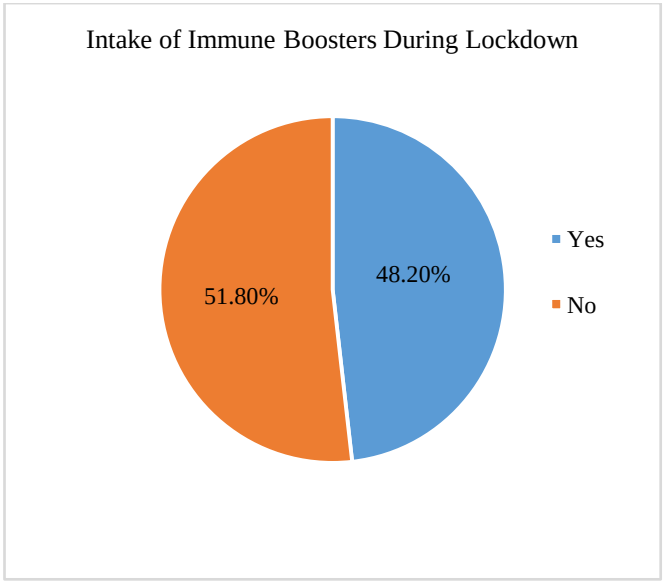

Figure-14: Intake of Immune Boosters During the Lockdown (March-July, 2020)

4.11 Mental Health During The Pandemic:

It is observed that 47.9 % of the tested young population experiences fluctuating mental stress and tension due to the pandemic and 22.6% undergoes complete mental stress, whereas, 29.5% reports no experience of mental stress during the pandemic induced lockdown period of March - July, 2020 (Figure-15).

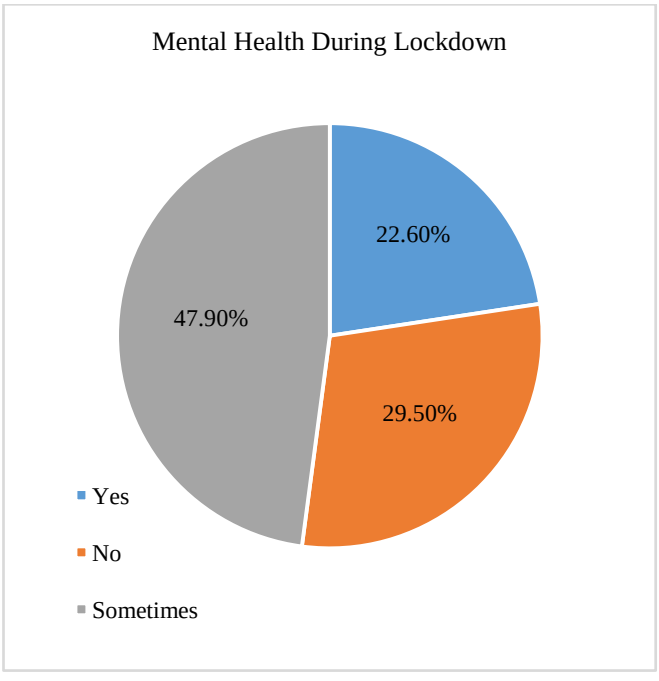

Figure-15: Mental Health During The Lockdown (March - July, 2020)

5. DISCUSSION

This report presents the data from an online survey comparing the food habits in young adults before and after the COVID-19 pandemic. This survey was conducted among the young adults in the age group 18-35 and there were 616 responses.

The questionnaire prepared was simple and easy to answer. It contains 38 questions covering all necessary information needed to assess the dietary habits. The diet-related items of the questionnaire assess the consumption of main meals, snack consumption, intake of healthy food items as well as unhealthy food items. Besides, there are also few questions regarding immunity-boosters and physical activity. We have prepared this questionnaire that will specifically target the young Indian population.

The response of this survey reveals that the current COVID-19 lockdown and other restrictions have brought changes in the food habits of youngsters who fall under 18-35 years of age. While only 61% of them used to live with their families during pre-covid period the figures raised significantly to 93.8% after the pandemic which in turn indicates the disrupted patterns of their studies and career. Furthermore, before the COVID-19 lockdown, nearly 20% of the subjects preferred restaurant food. On the contrary post COVID-19 data justifies the same figures has plummeted to a mere 0.8% This suggests a high percentage has switched to home-made food which substantiate a change in the food habit patterns among the young individuals.

Accordingly, the consumption frequencies have also elevated considerably. About 51.5% respondents reported a proper routine of food consumption during the pandemic. Staying in their own houses might be the reason why these much people are able to maintain a proper food routine. However, 43.8% reported to have a bad routine compared to the past which may be due to the increased sleeping time and increased mental stresses.

The desire for packaged foods and online delivered foods has reduced extensively during this pandemic time, may be as part of trying to be more cautious about outside foods. The inclination for animal or meat-based preparations has also surprisingly dwindled. However, there was a fondness for foods prepared by boiling/ steaming / grilling methods during the lockdown.

Most adults are confined to their homes resulting in an increase in their frequency of snack consumption. On the contrary, a reverse in the above pattern is observed in another 27.3%. This

can be owing to the fact that a comparable percentage of individuals began following a healthy diet.

A significant increase in the level of water consumption was not reported in this survey. This is possibly due to the fact that most of the young adults are staying at homes thus hardly causing energy lose or thirst. An awareness about the importance of drinking sufficient amount of water must be considered in this regard.

It is worthy to mention that a greater number of them purposefully included immunity boosting foods such as citrus fruits, ginger, turmeric and garlic in their diet, which again indicates their healthy approach towards being vigorous during the crisis. This is a good scenario as maintaining the immunity is essential for prevention and management of viral infections.

Talking about the awareness on weight management, a large portion that is about 40.3% was of the opinion that they have a normal weight management, similar to what they had before pandemic. 28.1% reported a better weight management, possibly, due to the increased awareness about the physical fitness. However, 11.5% reported a decline in weight management which could be mostly due to the closure of gyms and sports complexes.

It is shocking to know 47.9% respondents experience fluctuating mental stress and tension due to the pandemic. These high figures can be read in conjunction with the severe dip in the job market witnessed during the pandemic, consequently displacing the mental stability of recent graduates who remain unemployed. Also, cases of COVID-19 and fear of getting infected can be other reasons for this mental stress.

COVID-19 has interrupted the normal life of people all around the world. Measures adopted to minimize the spread of virus like lockdown has resulted in barriers to access food from outside and also to access to gyms, parks, etc. Anyhow, the results of this study conclude that young adults have given importance to their health during the pandemic situation by changing their eating patterns.

6. FUTURE SCOPE

As the COVID-19 is still persistent and this study primarily focused on the early stages of pandemic, future studies can use this data to compare and check whether these food habit changes have been varied in this long run of pandemic. It is necessary to continue to evaluate the population in the future too, and to compare with the current data. It helps to know the extent to which the people have affected with the pandemic. This data can also be used by various Health and Government officials to attain valuables information related to the health of people, by analyzing the changes that have taken place during pandemic crisis. This helps them easily to take necessary actions to embrace a healthy lifestyle. This data which is an indicative of the present lifestyle can be used to decide whether there is a need for nutrition education strategies exclusively for this pandemic time. Assimilating the exact food habit pattern that has taken place during this pandemic, will provide better awareness among everyone. Finally, for all those studies that are directly or indirectly related to food habits, can use this data as a conceivable source of reference.

7. CONCLUSION

This case study highlights the effects of diversity in eating trends with the strike of the COVID-19 pandemic in young Indian adults. A food pattern related questionnaire is a good way to assess the diet pattern changes during the COVID-19 pandemic. In this survey, we have examined the alterations in the diet pattern of young adults during the COVID-19 lockdown from the normal diet pattern they earlier followed. As the COVID-19 pandemic is still ongoing; this data can be used as a tool among young adults to emphasize the importance of following a healthy diet during fatal viral outbreaks. Our study attempts to understand how lockdown has impacted the food consumption behaviors of young adults. It indicates that the significant transformation in food habits during and before COVID-19 lockdown was found among those individuals who are confined to homes but used to live away before the pandemic. Overall, young adults became more careful about their food choices and health during this crisis period. To encapsulate, the pandemic hit has adversely affected young population in every angle of their lives consequently bringing forth critical changes to diet patterns they earlier followed. On account of this the above study can be used as a future reference for similar researches seeking the reflections of diversified diet patterns in people during disease outbreaks.

However, there are potential limitations in the current study that should be considered as warnings. Since the study was limited to 616 young adults, the comparison of food patterns can be slightly fluctuating on a larger population. However, the existing samples are critically analyzed to get results with accuracy. Secondly, our work is entirely based on the food behavior of young adults who belong to the age group of 18-35 years. Furthermore, all those who volunteered for the survey

were Indians, a majority of them being south Indians, suggesting the result was more suitable for south Indian young adults; whether it can be applied to other population remains unknown. As a result, we cannot speculate the equivalent outcomes in other sections of the population. Therefore, multi centre studies with larger sample sizes from different age groups are needed to understand the implications of altered food patterns due to the COVID-19 pandemic which verifies and expands our observations. Lastly another drawback is the short period in which the survey was conducted which prevents us from drawing conclusions about the trends in future since the pandemic is ongoing.

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