Food consumption behavior and lifestyle changes among rural older adults before and during the Covid-19 pandemic in Northern India: A cross-sectional study

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Research Article

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Abstract

Background: Due to Covid-19, the lockdown was imposed throughout the nation on 24 march 2020 and Covid-19 is not over yet, cases are still coming. Food insecurity was already a problem but it became even more challenging during the pandemic. Especially rural older adult people have had to deal with the problem of food and health-related issues due to the pandemic.

Objective: This study aimed to assess food consumption behavior and lifestyle changes among rural older adults before and during the Covid-19 pandemic.

Material and Methods: A retrospective cross-sectional study has been done; a multistage random sampling technique was used to select the participants. 450 participants were taken aged 60 and above for final analysis. The survey was conducted in the rural areas of the Varanasi District, Uttar Pradesh through personal interviews. The McNemar and Wilcoxon sign rank tests were used to examine differences before and during the Covid-19 pandemic, adopting the statistical significance of $p< 0{\cdot}05$.

Results: Mean age of participants were found 66.72 years. 66.0% of people faced a shortage of food. 40.9% of people reported that they had reduced their food intake and 39.6% reported that the reduction in food intake was due to the rise in the price of edible items. 27.6% of participants reported a reduction in body weight. There was a significant percentage decrease in consumption of milk products, pulse, and green vegetables($p<0.001$), a percentage decrease in initiating and maintaining sleep ($p<0.001$), and worse health conditions ($p<0.001$).

Conclusions: Food consumption behavior and lifestyles have changed significantly during the Covid-19 pandemic among rural older adults. Although some lifestyles haven't changed significantly, the quantity of food and health conditions were compromised.

Keywords: Food consumption, Covid-19, Lifestyle, Before and during, Eating habit

1. Introduction

The Covid-19 pandemic, which is present in more than 180 nations worldwide, is a serious threat to humankind (Xu et al., 2020). In addition to negatively impacting people's physical health, this pandemic also resulted in profound changes in their lifestyles.

In India, the lockdown was imposed on 24 March 2020 due to Covid-19 and lessened after 2 months (Mandal et al., 2020), but Covid-19 is not over yet, cases are still coming. As a result of this pandemic, the general public had to deal with problems like a lack of food supplies, a lack of fresh fruit and vegetables, financial concerns, and mental stress, all of which contribute to emotional and mental breakdowns(Mehta, 2020). The threat of the pandemic, might also lead to reduced income, job losses, and worry about an unknown future, which could cause people to curtail overall spending, especially on food and healthcare (Deschasaux-Tanguy et al., 2021). Some studies, however, have shown trends toward unfavorable food consumption behaviors due to Covid-19 such as reduced consumption of fresh vegetables and fruits, and reduced weight (Zachary et al., 2020). Also, studies conducted in various communities have previously shown that the lockdown and home quarantine security measures used to combat the novel coronavirus promoted numerous changes (Scarmozzino & Visioli, 2020), interfered with routines and lifestyle, decreased physical activity (Gallè et al., 2020), and altered dietary patterns and food purchases (Di Renzo et al., 2020).

According to the LASI report India 2020, there are 46% of persons over the age of 60 and above in India, and 68% of them reside in villages. Moreover, another study showed that older adult people have faced more problems with food and health-related issues due to the Covid pandemic (Rani, A. et al.,2022). That is why we included village older adults in our survey and attempted to study about the consequences of the Covid epidemic on them.

2. Statement of the Problem

We have noticed from numerous studies that Covid-19 has an impact on people of all ages and social groups. Additionally, we have observed that issues such as food insecurity, changes in daily routine, and many others have emerged due to the pandemic (Zachary et al., 2020, Deschasaux-Tanguy et al., 2021). Therefore, this is the driving force behind our investigation.

3. Objectives

The study aims to determine how the coronavirus pandemic (Covid-19) affected older adults living in rural areas in terms of their daily routines, including changes in eating and sleeping patterns.

4. Material and Methods

4.1 Study design and participants

A retrospective cross-sectional survey was conducted from March 1 to April 30, 2022, in 30 villages of the Varanasi District, Uttar Pradesh. Using multistage random sampling techniques older adult samples were selected from the Varanasi district. The selection of villages, segments, households, and individuals from the villages of the Varanasi district formed different stages of sampling. In the final analysis, 450 older adult samples were taken. The basic instrument of data collection was a personal interview method. Information on daily habits like hours of sleep, type of work, and eating habits were taken at the time of survey. The context of during covid 19 pandemic: Information was collected for the preceding 2 years at the time of the survey. The study was approved by the department of statistics, Institute of Science, Banaras Hindu University.

4.2 Variables

Information related to this study was collected for two point of time (before pandemic and during pandemic) at the time of the survey.

Four groups were prepared using the obtained information. The first group contains information regarding their age, gender, educational level, type of family, current occupation, socioeconomic status, and weight. The following sets of questions were used to gather information on food consumption behavior and lifestyle patterns for two point of time.

Concerning lifestyle, questions about substance abuse (No/Yes), doing household chores (Never /1-2 days in a week /3-4 days in a week /5-6 days in a week /Always), sleeping hours

(<6 hours /6-8 hours />8 hours), initiating and maintaining sleep (Good/Bad), family and friends support for maintaining a better lifestyle (Never /Sometimes /Always) and health conditions (Good/Medium/Bad) were asked.

To comprehend the nutrition consequences and food insecurity, questions regarding food insecurity (No/Yes), changes in food intake (No changes/Reduced), and weight loss (No/Yes) were also asked during interviews.

To investigate food consumption behavior during the Covid-19 Pandemic, questions related to the consumption of milk products, pulses, eggs, meat, fish, and kadha were carried out. Participants could choose their frequency of consumption for each type of food by choosing from: (Never /Occasionally /1-2 days a week /3-4 days a week /every day).

Kuppuswamy socioeconomic scale 2021 was used to classify the socioeconomic class of the participants.

4.3 Statistical analysis

The data were analyzed using SPSS 25 (Statistical Package for Social Science). To comprehend the responses of the participants, descriptive statistics like frequency and percentage were used. Mean and Standard deviation was calculated from data for Age, Weight, and Body Mass Index (BMI). The McNemar and Wilcoxon sign rank tests were used to investigate the difference between variables ($p<0.05$).

5. Results

5.1 Socio-demographic profile of participants

A total of 450 participants' responses were analyzed. Table 1 shows comprehensive details about the Socio-demographic characteristics of the study population. The most of participants (60.2%) were men, aged 60-69 years (70.0%). The mean age and weight of the participants were found to be (66.72-year), (51.6 kg) respectively. The majority of the participants were found to be of normal weight (60.4%) and mean BMI (21.1 kg/m^2). Almost two third of the participants were not working (68.2%). Most of the participants lived in a joint family (73.6%), were illiterate (64.7%), and belonged to the lower class (43.6%).

Table 1. Socio-demographic characteristics of the respondents

Age (years) mean ± SD (min-max)	66.72±6.7(60-90)
60-69, n (%)	315(70.0)
70-79, n (%)	93(20.7)
≥80, n (%)	42(9.3)
Gender	
Male, n (%)	271(60.2)
Female, n (%)	179(39.8)
Weight (kg) mean ± SD (min-max)	51.6±10.6(23.9-93.6)
BMI (kg/m^2) mean ± SD (min-max)	21.1±3.8(9.8-40.4)
Underweight (<18.5), n (%)	108(24.0)
Normal weight (18.5-24.9), n (%)	272(60.4)
Overweight (25.0-29.9), n (%)	59(13.1)
Obesity (≥30.0), n (%)	11(2.4)
Occupation	
Not working	307(68.2)
Agriculture	37(8.2)
Industrial laborer	47(10.4)
Small Business	24(5.3)
Others	35(7.8)
Type of family	
Joint, n (%)	331(73.6)
Nuclear, n (%)	119(26.4)
Education	
Illiterate, n (%)	291(64.7)
Primary, n (%)	57(12.7)
Secondary, n (%)	34(7.6)
High School, n (%)	30(6.7)
Intermediate, n (%)	21(4.7)
Graduate & above, n (%)	17(3.8)
Socioeconomic status	
Lower class	196(43.6)
Lower middle class	176(39.1)
Middle class	55(12.2)
Upper middle class	23(5.1)

5.2 Food insecurity and dietary outcomes

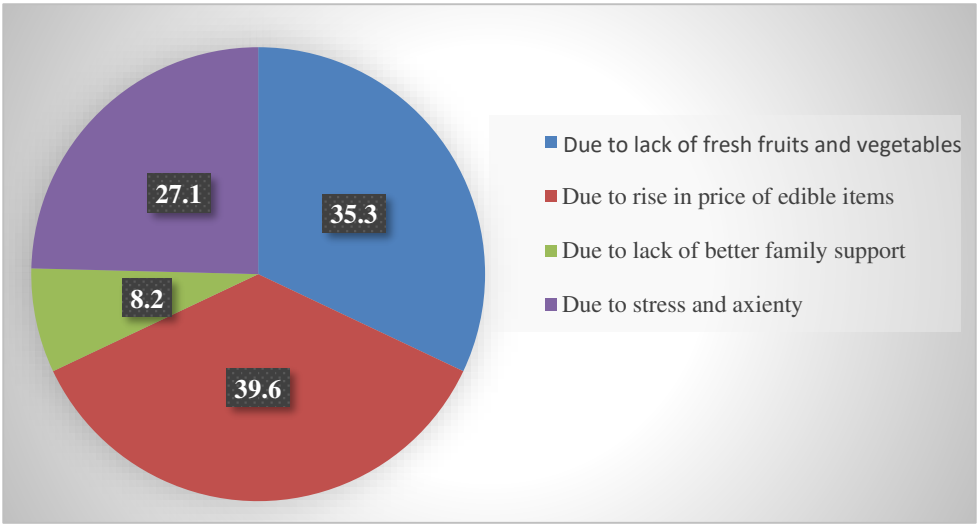
When questions were asked about food insecurity, most of the participants reported yes (66.0%). However, 40.9% reported a reduction in food intake, and 27.6% reported weight loss during the pandemic (Table 2).

Table 2: Food insecurity and dietary outcomes in rural households during Covid -19 pandemic

Variables	Male N (%)	Female N (%)	N (%)
Food insecurity			
No	96(35.4)	57(31.8)	153(34.0)
Yes	175(64.6)	122(68.2)	297(66.0)
Changes in food intake			
No changes	167(61.6)	99(55.3)	266(59.1)
Reduced	104(38.4)	80(44.7)	184(40.9)
Weight loss(self-reported)			
No	197(72.7)	129(72.1)	326(72.4)
Yes	74(27.3)	50(27.9)	124(27.6)

Participants were asked to give the reasons for the reduced food consumption during the pandemic. Figure 1 showed the percentages for each reason and it was found that most people have attributed the rise in the prices of edible items (39.6%) followed by a lack of fresh fruits and vegetables (35.3%).

Figure 1: Percent decrement in food intake due to various reasons among rural older adults



From figure 2 we found that those who belong aged between 60-69 years, reported more weight loss as compared to their counterpart (70.2%). 58.1 % of participants who belong to the lower class of socioeconomic status have reported more weight loss during the Covid-19 pandemic (figure 3).

Figure 2: Weight loss (Self-reported) according to the age groups of respondents

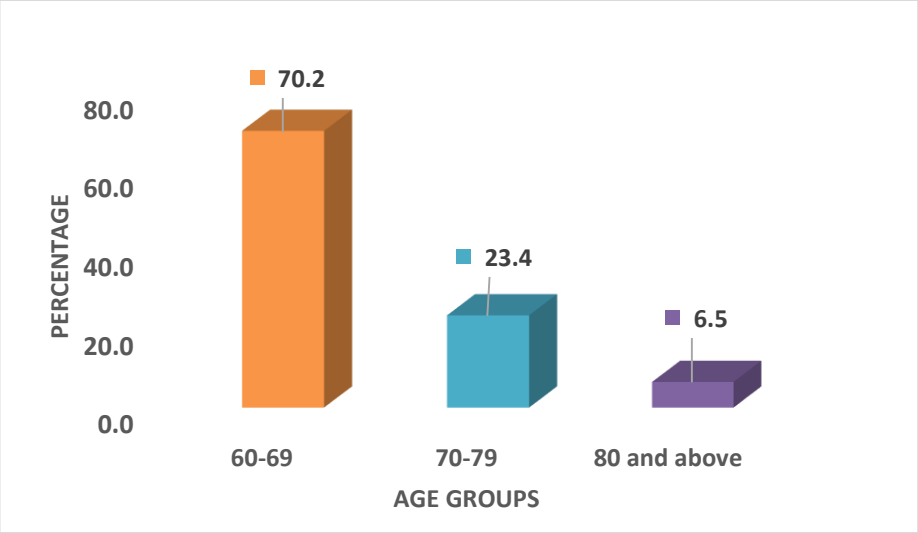
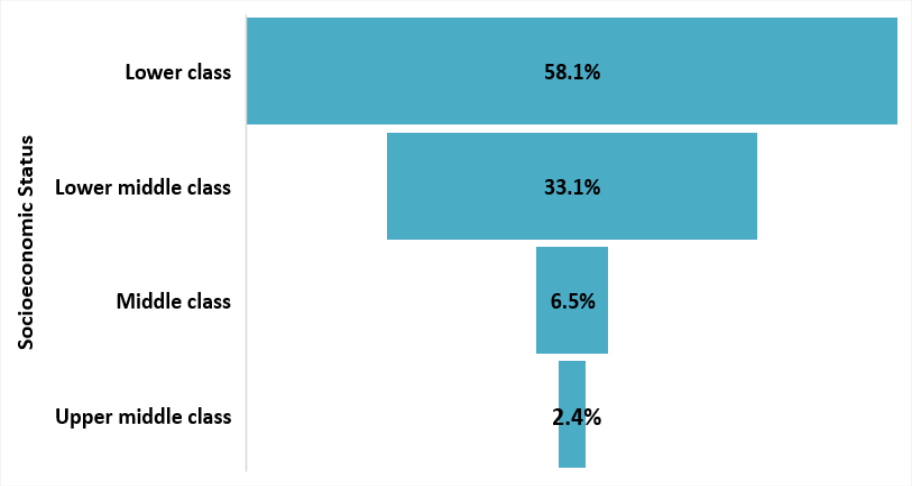


Figure 3: Weight loss (Self-reported) according to the Socioeconomic status of respondents



5.3 Eating habits

The eating patterns of the study population before and during the pandemic are shown in figure 4. Food items like milk and dairy products, pulse, green vegetables, and kadha showed significant differences in the percentage of consumption before and after the Covid-19 pandemic. The findings revealed that 71.6% of people who used to eat milk and dairy products daily before Covid-19 had decreased to 28.2% during the Covid-19 pandemic. Also, the percentage of consuming pulse every day decreased from 90.4% to 26%, and the percentage of those consuming green vegetables and fruits every day decreased from 90% to 32.9%. Moreover, the percentage of participants consuming kadha per day increased from 1.8% before Covid-19 to 69.3% during the Covid-19 pandemic.

5.4 Lifestyle

Questions were asked from the participants to indicate the frequency of doing household chores, sleeping time, initiating and maintaining sleep, family and friend support for maintaining a better lifestyle, health conditions, and substance abuse at the time of the survey. Results showed, no significant percentage changes in doing household chores, sleeping time, family and friends support, and substance abuse during the Covid-19 pandemic in the rural region. But there was a significant percentage change in initiating and maintaining sleep, and in health conditions ($p<0.001$).

Figure 4: Percentages of food consumption before and during the Covid-19 pandemic (n=450)

Fig. 4(a): Milk and dairy product consumption (%)

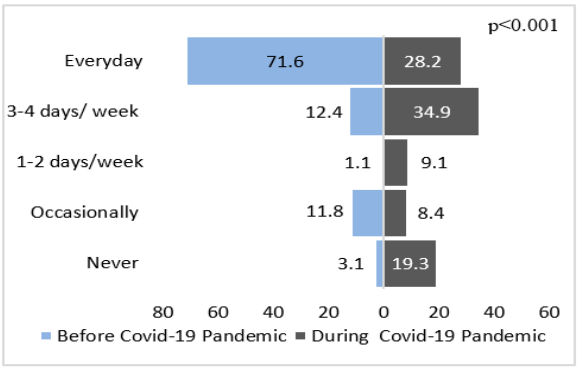


Fig. 4(b): Pulse consumption (%)

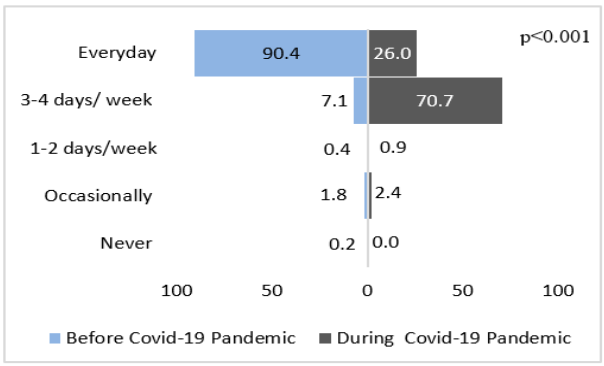


Fig. 4(c): Green Vegetable and Fruits consumption (%)

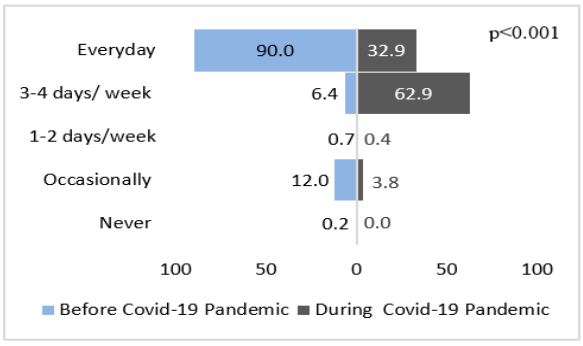


Fig. 4(d): Egg consumption (%)

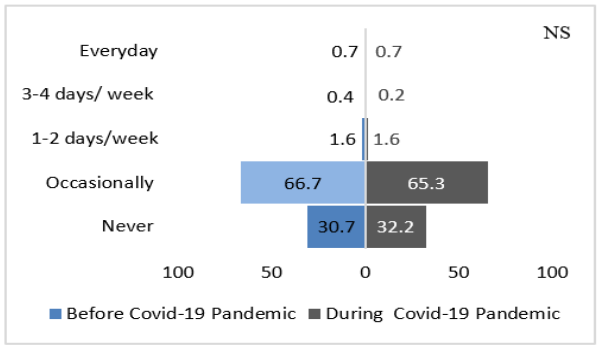


Fig. 4(e): Meat consumption (%)

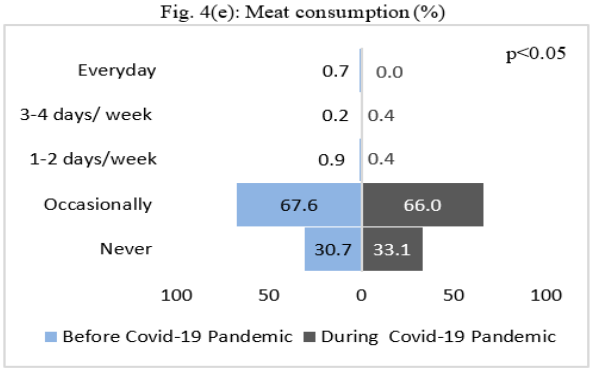


Fig. 4(f): Fish consumption (%)

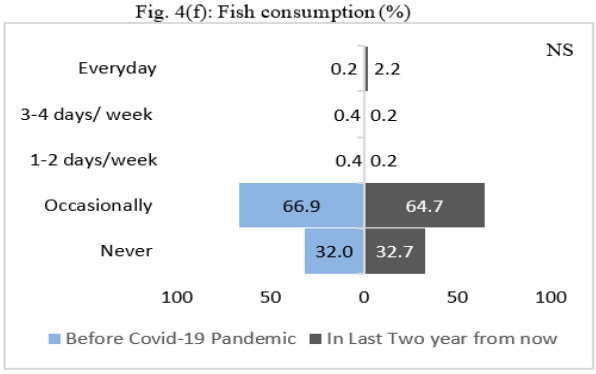


Fig. 4(g): Kadha consumption (%)

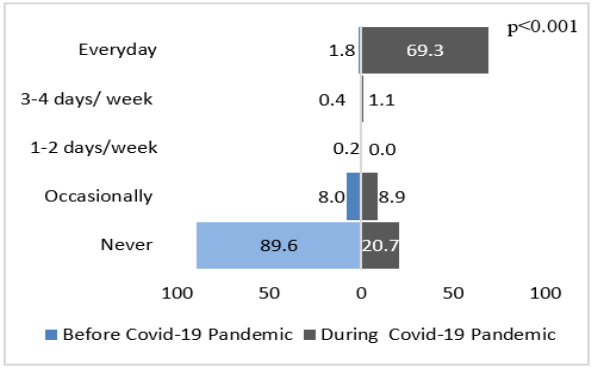


Table 3: Lifestyle-related changes among rural older adults

Variables	Before Covid-19 N (%)	During Covid-19 N (%)	p-value
Doing household chores			NS
Never	84(18.7)	87(19.3)	
1-2 days/week	151(33.6)	150(33.3)	
3-4 days/week	137(30.4)	135(30.0)	
5-6 days/week	17(3.8)	17(3.8)	
Always	61(13.6)	61(13.6)	
Hours of Sleep/day			NS
<6 hours	9(2.0)	13(2.9)	
6-8 hours	438(97.3)	432(96.0)	
>8 hours	3(0.7)	5(1.1)	
Initiating and maintaining sleep			P<0.001
Good	466(95.6)	347(77.1)	
Bad	20(4.4)	103(22.9)	
Family and Friends support maintaining a better lifestyle			NS
Never	54(12.0)	54(12.0)	
Sometimes	384(85.3)	382(84.9)	
Always	12(2.7)	14(3.1)	
Health conditions			P<0.001
Good	404(89.7)	278(61.8)	
Medium	34(7.6)	98(21.8)	
Bad	12(2.7)	74(16.4)	
Substance abuse			NS
No	213(47.3)	214(47.6)	
Yes	237(52.7)	236(52.4)	

Note: NS: Not Significant

The percentage of older adult participants who reported bad in initiating and maintaining sleep increased from 4.4% before Covid-19 to 22.9% during the Covid-19 pandemic. Similarly, the percentage change in bad health conditions was reported from 2.7% before Covid-19 to 16.4% during the Covid-19 pandemic (Table 3).

6. Discussions

This research focused on how rural older adults' daily routines, food consumption habits, and lifestyles changed during the Covid-19 pandemic. Our main findings showed that there were

issues with food availability, most of which resulted in decreased food consumption and weight loss.

Additionally, eating patterns have changed, and also found that significant decrement in the use of milk and dairy products, pulses, green vegetables, and fruits, while a significant increment was noted in the kadha's consumption during the Covid-19 pandemic. Moreover, there was a significant percentage change in initiating and maintaining sleep, and health conditions ($p<0.001$).

While comparing our findings with those of other related research, we found that the pandemic's effect on home isolation caused changes in food-related behaviors in an American survey (n=484 adult participants), persons who were experiencing food insecurity had decreased their consumption of fruits and vegetables from the beginning of the Covid-19 pandemic (Litton & Beavers, 2021). Eating behavior patterns changed during Covid-19. Consumption of regular milk, pulses, and green vegetables was decreased but a significant improvement can be seen in routine consumption of more than once a week of protein-rich food such as pulses and green vegetables. There were not much more changes in the consumption of meat, egg, and fish but the study shows that they were taking it more than once a week. Some studies also found a slight improvement in protein-rich food consumption (Chopra et al., 2020). A possible reason for this difference in rural reason due to the lack of fresh vegetables and the rise in the price of edible items. During the Covid-19 intake of the herbal drink (Kadha) an ayurvedic home remedy that consists of some immunity booster ingredients such as fennel seed, black paper, cinnamon seed, basil (tulsi), ginger, turmeric, etc was increased. Additionally, some studies discovered a rise in the use of products that improve immunity (Gupta R et al., 2020; Francis et al., 2022; Paul et al., 2020). Slipping time remains unchanged before and during Covid-19 but the quality of bad sleep was increased. Anxiety, fear of novel diseases, and mental stress can cause poor sleep quality. Some studies also reported that the pandemic affected sleep patterns among Indians (Chopra et al., 2020; Dey & Dey 2020; Gupta et al., 2020; Sankar et al., 2020). Bad health conditions significantly increase during Covid-19 and weight loss was also seen in elderly people. Lack of support for adequate public health care during Covid-19 in rural areas may be the reason for the increase in poor health conditions.

7. Conclusions

The present study has highlighted that food consumption behavior and lifestyles have changed significantly. Although some lifestyles haven't changed significantly, the quantity of food and health conditions were compromised. Moreover, reduced weight loss was also recorded in the participants during Covid -19. Therefore, the findings of this study can help policymakers, public health experts, and the Indian government to launch efficient initiatives to address such types of problems in the future.

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