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Effect of Altered Lifestyle During Lockdown on Pandemic of Obesity

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ABSTRACT

Introduction: India reported the first COVID-19 case on 30 January 2020 and due to mass and rapid spread of disease in other countries, the Indian government took immediate steps. India observed lockdown from 22 March to 31 May 2020 with conditional relaxation after that. The schools, colleges, and workplaces continued to be closed or functioned online only. So, young age group observed a marked shift to sedentary lifestyle.

Aim: Study was aimed to assess the effect of changed lifestyle during lockdown on leading us to another pandemic of obesity.

Methodology: An electronic questionnaire was distributed using applications like Whatsapp and Instagram to people of age group 15 to 30 years across India. The questionnaire had 3 sections -general questions, questions related to lifestyle patterns before lockdown, and during lockdown.

Results: We received 500 responses. Study found that 60.74% of males and 64.42% of females showed an increase in BMI during the lockdown. It was observed that before lockdown 47.8% of the participants lived with family but during lockdown, 98.6% of participants lived with family. Sleeping hours and the number of meals taken daily increased. An unexpected increase in physical exercise was reported. Fast food, alcohol intake and smoking reduced to a minimum. Participants also reported reductions in stress eating habits. Conclusion: The changes observed during lockdown led to an increase in BMI but participants already in the obese category reported decreased BMI. So, more participants shifted to the overweight category while the number of participants in the obese category decreased.

Conclusion: We observed that more participants shifted to overweight category while the number of participants in obese category decreased during the lockdown period.

Key Words: Pandemic, Corona, Obesity, Lifestyle, Participants, Disease

INTRODUCTION

The outbreak of coronavirus disease 2019 (COVID-19) caused by the novel coronavirus severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) occurred in India in January 2020. First case of COVID - 19 in India was reported on 30th January 2020 and after seeing the mass and rapid spread of disease in other countries, the Indian government decided to take immediate steps. India observed lockdown from 22th March to 31st May 2020 with conditional relaxation after that, although the schools, colleges, and workplaces continued to be closed or functioned online only. So a marked shift to a sedentary lifestyle in the young age group was observed. This shift increased the chances

of greater risks, as prevalence of overweight and obesity in India is increasing faster than the world average. Also, during the pandemic, supply chain disruption and panic buying may have limited access to fresh foods, increasing reliance on unhealthier foods with longer shelf lives.¹ This might have played an important role in increasing the chances of obesity.

According to WHO, overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health. Body mass index (BMI) is considered the most appropriate criteria to assess obesity.

BMI classification: ^{2,3}

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- Severely underweight – BMI less than 16.5 kg/m²
- Underweight – BMI under 18.5kg/m²
- Normal weight – BMI greater than or equal to 18.5 to 24.9 kg/m²
- Overweight – BMI greater than or equal to 25 to 29.9 kg/m²
- Obesity – BMI greater than or equal to 30 kg/m²
- Obesity class I – BMI 30 to 34.9 kg/m²
- Obesity class II – BMI 35 to 39.9 kg/m²
- Obesity class III – BMI greater than or equal to 40 kg/m² (also referred to as severe, extreme, or massive obesity)

According to ICMR INDIAB study 2015, prevalence rate of obesity and central obesity varies from 11.8% to 31.3% and 16.9%-36.3% respectively.⁴ The National Institute for Nutrition, showed high prevalence of obesity in adults in a study in 2016. The study showed 44% of women were obese in urban India. During the lockdown period lifestyle patterns changed and it became important to assess if this is increasing the prevalence of obesity in the young age group.

Objective

- To assess various lifestyle changes during lockdown.
- To assess the effect of changed lifestyle during lockdown on leading us to another pandemic of obesity

Methodology

This was a questionnaire based study. Hence, institutional ethics committee approval was not required.

We distributed an electronic questionnaire using popular social media platforms like WhatsApp, Instagram and Telegram. It was randomly circulated throughout India. The advantage of the electronic questionnaire was that it could be distributed even in the areas of lockdown restrictions.

We collected data from 26th June 2020 to 18th July 2020.

The age group selected for the study was between 15 to 30 years. A study by Amudha P. et al indicated that weight increases during this life stage of transition at a high rate that is 1kg/year.⁵ As a result with changed lifestyles during lockdown, we expected a greater effect in this age group. Along with this because of online classes in all schools and colleges, and work from home conditions even after conditional relaxation of lockdown, this population group was affected for a long time. This age group also observed a significant change in living conditions as most people started living with family during lockdown.

The questionnaire consisted of a total of 53 questions divided into three different sections.

The first section consisted of personal information like age, height, profession, and medications; the next two sections contained similar questions with respect to before and during lockdown.

It included questions on eating patterns, sleeping habits, physical activity and exercise, smoking and alcohol intake. The eating pattern questions consisted of questions related to number of meals per day, consumption of snacks and dessert, special diet, water drinking habit, meal skipping, caffeine and fast food intake, stress eating and sensation of satiety. Total sleeping hours at night and nap hours were asked under the questions related to sleeping habits.

We calculated the BMI of each participant based on the data collected about their height and weight to minimize error.

We collected a total of 510 responses out of which only 500 responses were proper (98.04%) and considered for the study.

This was a questionnaire based study. Hence, institutional ethics committee approval was not taken.

RESULTS

The online survey ended on 18th July 2020, after which we assessed all the collected data. After complete validation of data, 500 responses (98.04%) out of 510 responses collected were taken for assessment.

Out of 500 participants, 242 were male, 253 were female and 5 preferred not to tell their gender.

The major change in lifestyle was expected because of change in living conditions in lockdown as it was observed that before lockdown only 47.8% (239) participants lived with family but during lockdown 98.6% (493) participants shifted to family living. This shift indicated change in eating patterns, sleeping hours, physical activity, and stress.

BMI changes: We calculated the BMI of each participant for before and after lockdown conditions based on the data we received. From the calculated BMI, we observed that 60.74%(147) males, 64.42%(163) females and 80%(4) of other genders showed an increase in BMI [Table1, Figure 1,2,3].

Eating habits changes: Eating habits were assessed by different questions like frequency of meals, snacks, skipping meals, fast food intake, stress eating and satiety. We observed an increase in frequency of meals for 17.4% participants and decrease for only 2.8% of participants while for frequency of snacks 18.2% showed increase, while 7% showed decrease, while for the rest both remained same. Fast food intake decreased in a large group of participants as 67.2% reported decrease (figure 4). 12.2%(61) participants reported an increase in stress eating, 28.4%(142) reported a decrease while 59.4%(297) reported no change in stress eating habits. For meal skipping habits we observed that before lockdown only 26% of participants never skipped meals but after lockdown was implemented 60.6% participants reported that they

stopped skipping meals (Table 2, Figure 4). 15.8%(79) participants were not mindful of satiety before lockdown but have now become mindful of satiety while 15.2%(76) have lost their mindfulness of satiety in lockdown.

Sleep changes: Change in sleeping hours was also observed during lockdown. 49.2%(246) participants reported increase in sleep hours, while 8%(40) reported decrease. The people taking optimum sleep of 8 to 10 hours increased from 17.2% to 48.8% (Table 3, Figure 5).

Physical activity changes: We observed unexpected results for exercise and activity in people because it was expected that going out was not allowed so people won't indulge in exercise. 36%(180) of participants reported increase in exercise routine while 24.2%(121) reported decrease and for 39.8%(199) exercise routine remained the same (Figure 6).

Alcohol and smoking habits are related to obesity so we also assessed the pattern in all participants. Out of all participants, only 3 started alcohol drinking during lockdown. There were 66 alcohol drinkers among all but 52 of those showed a decrease in alcohol intake. While for smoking also 93.8% never smoked before lockdown while this increased to 96.6% after lockdown. So alcohol and smoking habits were not observed in the majority of participants as a result we couldn't assess any significant relation between these parameters and obesity.

We also asked the participants about their perception of being obese and observed that before lockdown only 13.8% participants considered themselves obese while after lockdown 18.2% considered themselves obese (Table 5, Figure 7).

We also collected data for various lifestyle components like water intake, dessert intake, fruits and vegetable intake, caffeine intake, and satisfaction about their eating patterns but no significant change was observed.

Table 1: Change in BMI after lockdown was implemented

Change in BMI	Increase	Same	Decrease
Male(242)	(60.74%)	(16.53%)	(22.73%)
Female(253)	(64.42%)	(18.18%)	(17.4%)
Prefer not to say(5)	4(80%)	0(0%)	1(20%)

Table 2: Variation in meal skipping habit

Frequency of meal skipping	Frequently	Sometime	Never
Before lockdown	90(18%)	280(56%)	130(26%)
After lockdown	40(8%)	157(31.4%)	303(60.6%)

Table 3: Variation in sleeping hours

Sleeping hours	4 to 5 hours	6 to 7 hours	8 to 10 hours	More than 10 hours
Before lockdown	71(14.2%)	339(67.8%)	86(17.2%)	4(0.8%)
After lockdown	39(7.8%)	191(38.2%)	244(48.8%)	26(5.2%)

Table 4: Variation in Physical activity

Physical activity	One to two hours	Two to four hours	More than four hours
Before lockdown	415(83%)	63(12.6%)	22(4.4%)
After lockdown	419(83.8%)	63(12.6%)	18(3.6%)

Table 5: Variation in people's perception about their weight

Consider yourself obese	Yes	No	Maybe
Before lockdown	67(13.4%)	368(73.6%)	65(13%)
After lockdown	91(18.2%)	320(64%)	89(17.8%)

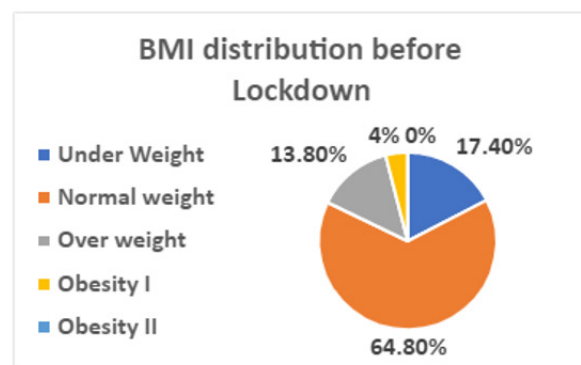


Figure 1: BMI distribution before lockdown

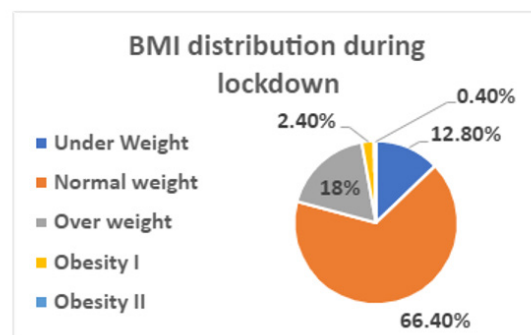


Figure 2: BMI distribution during lockdown

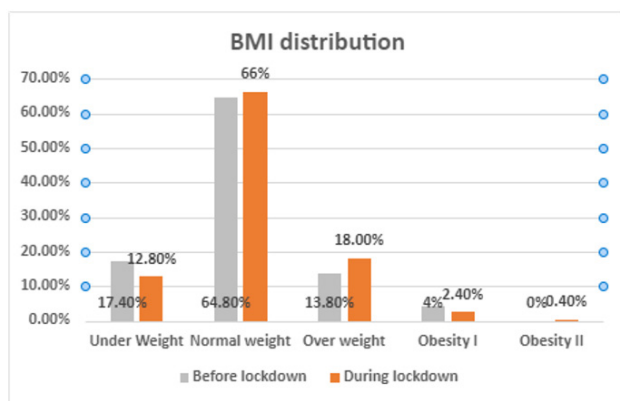


Figure 3: Graph showing BMI distribution before and during lockdown.

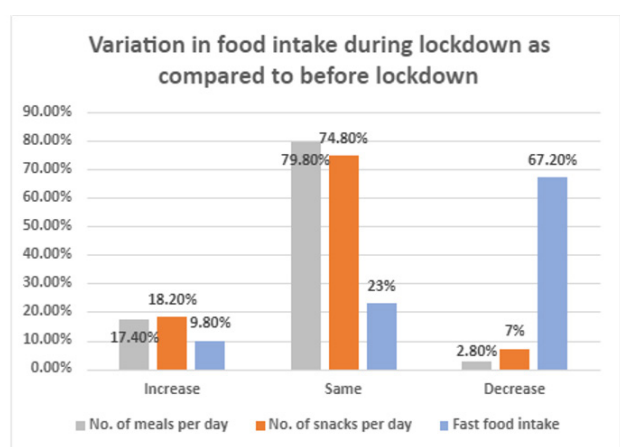


Figure 4: Graph showing variation in food intake during lockdown as compared to before lockdown.

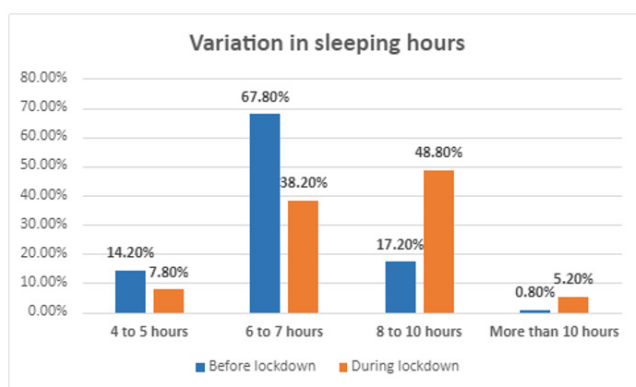


Figure 5: Graph showing variation in sleeping hours during lockdown as compared to before lockdown.

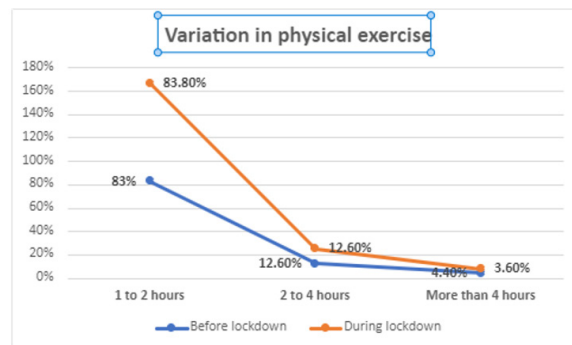


Figure 6: Graph showing variation in physical exercise during lockdown as compared to before lockdown.

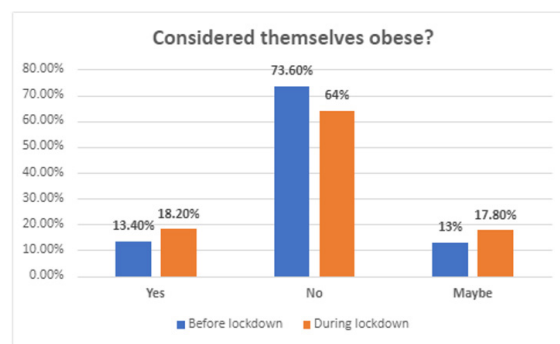


Figure 7: Graph showing variation in perception about their weight during lockdown as compared to before lockdown.

DISCUSSION

The study showed that there was a general increase in BMI of most people and a decrease in BMI of obese people. This result was in accordance with the Chinese Survey undertaken from 27th January to 1st March 2020. According to it, people with BMI < 24 were not normally troubled by being overweight or obesity, but also had less awareness of weight gain than people with BMI ≥ 24. Therefore, under the conditions of the semi-lockdown, they gained weight more easily.⁶ We studied changes in various habits of participants, like the number of meals and snacks per day, sleeping hours, fast food and alcohol intake, mindfulness of satiety, physical exercise, stress eating habits and living conditions, to know about its effect on the BMI change.

Approximately half of the participants showed an increase in their sleeping hours, and participants taking only 4 to 5 hours of sleep everyday reduced to 7.8% from 14.2%, which is considered an improvement as more people were now getting adequate amounts of sleep.

A Wisconsin Sleep Cohort Study, which was a population based longitudinal study of sleep disorders showed that subjects sleeping less than 8 hours had an increased BMI pro-

portional to the decreased length of sleep. Short sleep duration was associated with low leptin levels and high ghrelin levels, independent of BMI, age, sex, and other confounding factors.⁷

Data gathered about alcohol intake and smoking indicated that most of the participants showed a decrease in these habits, either due to lack of availability or due to increased awareness about their health. According to a cross-sectional study done in UK, current smokers were less likely to develop obesity than never smokers but, former smokers were more likely to develop obesity than both current smokers and never smokers.⁸

For alcohol intake correlation with obesity a research by Sayon-Orea et al. found that people who drink more than 7 times per week have higher risk of weight gain and development of overweight and obesity.⁹ Also, Shutz et al. study found that males who are light to moderate beer drinkers, have the chance of smaller increases in WC and weight than non drinkers or heavy drinkers over 8.5 years of follow up.¹⁰ But our participants were not habitual drinkers or smokers so any significant relation between the data collected could not be derived.

The number of meals and snacks consumed on a daily basis did not change for most participants but the number of participants who showed an increase were considerably higher than those who showed a decrease in the number of meals and snacks consumed daily.

We observed that more than half of the participants reported a decrease in fast food intake. A survey by the Economic Times (4th April, 2020) had shown that the frequency of food delivery orders made through applications like Swiggy and Zomato had dipped by 70% post lockdown due to fear of spread of the COVID-19.¹¹ This could be because people considered fast food and delivered meals as a major threat for the spread of COVID-19. This can also be because the participants were more health conscious during the lockdown period.

Meal skipping habits decreased in the participants mainly because of a less hectic schedule and family living conditions. By not following the biological clock (e.g., skipping breakfast and consuming bigger meals in evening or eating late night) is associated with an increased risk of obesity and type 2 diabetes.¹² As a result this was considered to be affecting obesity prevalence negatively.

The result observed for physical exercise was unexpected because even after being unable to go out, more participants showed an increase in physical exercise as compared to those who reduced their physical exercise. Another Indian study by Subhro B et al. on the impact of COVID 19 showed similar results. According to it, since the spread of coronavirus and imposition of lockdown, people have tried to maintain or

improve their physical well-being. People started doing exercise for at least 1-2 hrs.¹¹ According to an Italian research, those who previously managed to exercise only occasionally, now have more time to do it at home.¹³

The limitations of our study included that being an online survey, it couldn't reach people who did not have access to smartphones and internet. We did not divide the age into subgroups so we don't know which particular age group had the most impact.

CONCLUSION

An increase in BMI of 62% of the participants during lockdown was observed. The participants who showed increase in BMI were not in the obese category before lockdown. We observed that obese category participants either showed decrease or same BMI during lockdown. This can be due to lack of awareness about the weight gain chances in the participants of non obese category, as they had never observed the harmful effects of excess weight. So, they ignorantly changed their lifestyle pattern during lockdown resulting in increased BMI. However, obese participants were aware of their weight gain and positively used lockdown to change lifestyle pattern to control weight. More participants increased their exercise schedule, but the increase in number of meals counteracted it. We finally observed that more participants shifted to overweight category while the number of participants in obese category decreased during the lockdown period.

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Conflict of Interest:

The authors do not have any conflict of interest.

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