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# Impact of covid-19 lockdown on dietary habits in three groups viz sedentary individuals, gym goers and athletes of age group 21 to 29years.

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***Abstract-*** The World Health Organization (WHO) recognized the coronavirus illness (COVID-19), which started in Wuhan, China, as a global pandemic on March 11, 2020. Since then, it has expanded over the entire globe, having an impact on the lives of millions of people. Many nations, including India, instituted citizen lockdowns in an effort to reduce the number of instances. In India, the lockdown was imposed beginning across March 2020 in a number of states and towns. People were forced to stay inside throughout the lockdown, which interfered with their usual daily routines. The current study examines changes in dietary habits brought on by lockdown in three groups: sedentary individuals, gym-goers and athletes. This is a cross-sectional online study where a google form-made questionnaire was used. There were 90 participants in this study, with 30 in each group within age group of 21-29years both male and female. Participants with chronic disorder and athletes playing other sports except team sports or two sports at a time were excluded. It was observed that dietary habits were positively affected due to lockdown since, decrease in the outside food consumption was observed in all the groups. Participants with good physical activity levels pre-lockdown were able to maintain healthy dietary habits during lockdown. In conclusion, lockdown affected dietary habits of all the groups, but the impact was more significant on gym-goers compared to sedentary and athlete group.

**Key words:** Covid-19 lockdown, dietary habits, sedentary individuals, gym goers, athletes

## I. INTRODUCTION:

Coronavirus disease (COVID-19), originated from Wuhan of China was declared as a global pandemic by World Health Organization (WHO) on 11th March 2020. Since, then it has spread all over the world affecting the life of millions of people. In order to bring down increasing number of cases, many countries including India implemented lockdown of citizens. In India, the lockdown was implemented in various phases starting in March 2020, until the unlock phase which began in June 2020. This lockdown resulted in people being confined within their homes, and disrupted their regular daily activities and schedules including work, studies, exercise schedules and other leisure activities. Additionally, the COVID-19 pandemic and lockdown has resulted in people losing their lives or of their loved ones, people with medical conditions facing difficulty in receiving the due medical care, and has affected food availability and income for many. Thus, this lockdown has not only impacted the economy, medical and educational system of country, but has also impacted the life of people, either in a positive or negative way (Jena, 2020) (Sheth, 2020) (Gautam, 2020)

Lockdown has affected the physical activity, dietary habits and mental wellbeing of people. Due to lockdown migrants lost their job and were unable to have daily food availability for themselves and their family, due to this reason and due to zero travel facility they had to walk miles bare foot to reach their native place. Covid also took away many people life, due to this mental health of people was affected since they were scared and also depressed due to loss of their loved ones. Due to home confinement during lockdown, some people lost their habit of physical activity and healthy eating which resulted in weight gain. An increase in meal consumption with more reliance on ready-to-eat and packaged food than home-cooked food was reported due to increased work hours and high levels of stress during lockdown period (Mehta, 2020). On the other hand, some people have reported a renewed focus on eating healthy and engaging in physical activity, thereby reducing their weight and risk or severity of lifestyle-associated diseases. Several people have reported improvement in their eating habits during lockdown, by consuming more meals on a regular interval, choosing healthier options from varied food groups and minimizing junk food intake (Chopra, et. al., 2020). Studies on physically active individuals and athletes (Castro, et. al., 2021; Pillay, et. al., 2020) also found out that 50% of athletes were not able to follow a healthy diet during lockdown and the physically active individuals and athletes both reduced or stopped their supplements intake, choose unhealthy foods like ready to eat food, fizzy high carbohydrates drinks and red meat over a healthy diet.

The effect of lockdown in India has been studied on sedentary individuals belonging to middle-age group (Chopra, et. al., 2020; Mehta, 2020) and on people with medical conditions such as diabetes, hypertension or mental disorder (Saqib, 2020). Till date, there are no studies done on young adults mainly college and office goers. Also, there are no research on impact of lockdown on physically active and athletes of India in terms of their lifestyle i.e., their training and dietary habits. Due to the lack of research on the effect of lockdown and its relaxation on the lifestyle of young healthy Indians, the present study aims to study the changes in physical activity due to lockdown of three groups viz sedentary individuals, gym goers and athlete group.

## II. Methodology:

This study was designed to assess the influence of covid-19 lockdown on dietary habits of three groups viz sedentary individuals, gym goers and athlete group. In this study young adults (aged 21 to 29 years) were included.

**Selection of Participants:**

The study was conducted on young adults including both male and female participants aged 21-29 years training at sports clubs, gyms or are sedentary. Grassroot level team sports athletes, college students and office goers involved in desk job were included in the study. Athletes playing more than one sport or playing other than team sports were excluded. Participants with health conditions like diabetes, hypertension or cardiovascular disease were also excluded.

The study comprised of 90 participants, (30 sedentary individuals, 30 gym-goers and 30 team sport athletes). Sedentary individuals either were involved occasionally in walking, yoga or home workout or were inactive pre-lockdown. Gym-goers group were those who were involved in daily gym activities pre-lockdown and athletic group were those who were grass root level athletes playing team sports like cricket, football and basketball. Individuals were contacted through social media platforms including WhatsApp and Instagram.

Prior to data collection, the participants were informed about the study in detail and the importance of their role in this study. Informed consent was obtained from all the participants.

A Questionnaire was specifically designed to collect data on physical activity pre-during and post lockdown. The Questionnaire was constructed on google forms and for the ease of filling, it was divided into two parts personal details and dietary habits.

**Study Design**

**Screening of Participants:** Individuals were approached from all over India through social media platforms like Instagram and WhatsApp, and were screened for eligibility for participation in the study.

**Selection of Participants:** After the participants are screened, they were selected according to the selection criteria for the study. Then they were divided into three groups based on their physical activity (like sedentary individuals -group 1, Gym goers -group 2 and grass root level team sports athletes- group 3).

**Collection of Data:** A Questionnaire that focuses on the dietary habits pre, during and post lockdown, was used to collect relevant data from the selected participants. Questionnaire made on Google Form was shared with the participants.

**Analyzing and Evaluation of Results:** After the duly-filled questionnaire was collected, the data was analyzed and assessed to understand the influence of lockdown on dietary habits and the challenges faced by the participants. BMI was also calculated using the height and weight measurements provided by the participants. The data was compared to the post lockdown period to understand whether relaxation of lockdown guidelines resulted in changes in the dietary habits of the participants.

**Statistical Analysis:** The data was analyzed using the statistical package for social sciences (SPSS) software. The data was presented as mean ± SD and percentages. Chi-square test was used compare the variables in all the three groups.

## III. Results and Discussion:

The purpose of the study was to understand the impact of COVID-19 lockdown on dietary habits of sedentary individuals, gym goers and athletic group. The study was conducted on an online platform using a questionnaire.

### Participants Characteristics:

The study comprised of 90 young adult participants (male and female), aged 21 to 29-year-old. All participants were based in Maharashtra, and were either sedentary (n=30), gym goers (n=30), or grassroot level athletes (n=30) participating in team sports such as cricket, football and basketball. Participant characteristics can be found in Table 3.1.

Table 3.1.: Characteristics of the Participants

| Characteristics | Sedentary | Gym Goers | Grass Root Level Athletes |
|---|---|---|---|
| No of participants | 30 | 30 | 30 |
| Age (years)* | 22.60 ± 1.94 | 22.83 ± 2.39 | 21.97 ± 1.47 |
| Gender<br>Males:<br>Females: | <br>15<br>15 | <br>15<br>15 | <br>15<br>15 |
| Occupation<br>Student<br>Working | <br>21 (70%)<br>9 (30%) | <br>17 (56.7%)<br>13 (43.3%) | <br>23 (76.7%)<br>7 (23.3%) |
| Anthropometric Measurements<br>Height (cm)*<br>Weight (kg)*<br>BMI (kg/ $m^2$)*<br>BMI interpretation | <br>166.10 ± 10.16<br>64.30 ± 11.33<br>23.28 ± 3.46<br>Normal | <br>165.63 ± 9.20<br>65.63 ± 12.82<br>23.87 ± 4.06 Normal | <br>167.80 ± 7.74<br>56.87 ± 7.44<br>20.24 ± 2.65<br>Normal |

***mean ±SD**

Among all the participants, about 6.7% of sedentary individuals and 10% gym goers reported conditions such as abnormal period and vit d deficiency the rest did not have any medical condition. About 10% of gym goers reported use of medications like eltroxin and dietary supplements like calcirol, rinifol and tab hosit rest did not take any medication.

### Dietary Habits of Participants Pre, During and Post Lockdown:

Firstly, majority of the sedentary individuals consumed lacto-vegetarian diet (48.3%) while majority of gym-goers and athletes consumed non-vegetarian diet (46.7%) and (56.7%) respectively. 36.7% of the sedentary individuals and 40% of the athletes reported that their dietary habits were best pre-lockdown, while 56.7% of the gym-goers reported that it was post lockdown. Majority of all the three groups believed that lockdown affected their eating habits but, the change was positive. Self-reported reasons which motivated participants to follow health dietary habits were availability of time to cook, fear of eating outside and fear of illness. While the self-reported challenges faced by the participants to follow healthy diet during

lockdown were unavailability of various ingredients and grocery like fruits and curd, binge eating on packed food due to boredom and increased price of the food products made it difficult for the participants to cook healthy meals at home. Details of their dietary behavior in pre, during and post lockdown is mentioned in Table 3.1.

Table 3.1 Dietary Habits of Participants Pre, During and Post Lockdown

| | Sedentary | | | Gym Goers | | | Grass Root Level Athletes | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pre (%) | During (%) | Post (%) | Pre (%) | During (%) | Post (%) | Pre (%) | During (%) | Post (%) |
| **No. of meals in a day** | | | | | | | | | |
| 1-2meals | 60.00 | 43.30 | 60.10 | 3.30 | 10.00 | 0.00 | 26.70 | 13.30 | 33.30 |
| 3-4meals | 26.70 | 16.70 | 23.30 | 70.00 | 66.70 | 73.30 | 66.70 | 63.30 | 60.00 |
| 5-6meals | 13.30 | 33.30 | 13.30 | 23.30 | 23.30 | 23.30 | 3.30 | 20.00 | 6.70 |
| > 7meals | 0.00 | 6.70 | 3.30 | 3.30 | 0.00 | 3.30 | 3.30 | 3.30 | 0.00 |
| p value | | 0.296 | | | 0.677 | | | 0.201 | |
| **Consuming regular meals** | | | | | | | | | |
| Yes | 73.30 | 66.70 | 73.30 | 76.70 | 56.70 | 80.00 | 83.30 | 73.30 | 80.00 |
| No | 26.70 | 33.30 | 26.70 | 23.30 | 43.30 | 20.00 | 16.70 | 26.70 | 20.00 |
| p value | | 0.805 | | | 0.119 | | | 0.722 | |
| **Daily Water intake** | | | | | | | | | |
| <1Lts | 23.30 | 20.00 | 20.00 | 13.30 | 13.30 | 6.70 | 13.30 | 16.70 | 13.30 |
| 1-2Lts | 46.70 | 43.30 | 46.70 | 46.70 | 53.30 | 46.70 | 46.70 | 36.70 | 46.70 |
| 3-4Lts | 23.30 | 26.70 | 23.30 | 26.70 | 20.00 | 23.30 | 33.30 | 33.30 | 33.30 |
| >4Lts | 6.70 | 10.00 | 10.00 | 13.30 | 13.30 | 23.30 | 6.70 | 13.30 | 6.70 |
| p value | | 0.998 | | | 0.877 | | | 0.961 | |
| **Consumption of outside food** | | | | | | | | | |
| Everyday | 0.00 | 3.30 | 6.70 | 3.30 | 6.70 | 3.30 | 3.30 | 0.00 | 6.70 |
| 3-4 times/week | 20.00 | 6.70 | 13.30 | 30.00 | 3.30 | 13.30 | 30.00 | 6.70 | 13.30 |
| 1-2 times/week | 53.30 | 10.00 | 43.30 | 23.30 | 13.30 | 40.00 | 46.70 | 26.70 | 53.30 |
| Once/15days | 23.30 | 36.70 | 16.70 | 43.30 | 33.30 | 36.70 | 13.30 | 20.00 | 13.30 |
| Once/month | 3.30 | 23.30 | 20.00 | 0.00 | 30.00 | 6.70 | 3.30 | 33.30 | 10.00 |
| Once/3-4 month | 0.00 | 13.30 | 0.00 | 0.00 | 6.70 | 0.00 | 3.30 | 6.70 | 3.30 |
| Once/6months or more | 0.00 | 6.70 | 0.00 | 0.00 | 6.70 | 0.00 | 0.00 | 6.70 | 0.00 |
| p value | | 0.002 | | | 0.000 | | | 0.008 | |
| **Consumption of fried food or fast food** | | | | | | | | | |
| Everyday | 0.00 | 3.30 | 6.70 | 0.00 | 0.00 | 0.00 | 3.30 | 3.30 | 3.30 |
| 3-4 times/week | 20.00 | 3.30 | 10.00 | 16.70 | 10.00 | 0.00 | 16.70 | 13.30 | 10.00 |
| 1-2 times/week | 23.30 | 13.30 | 26.70 | 26.70 | 16.70 | 30.00 | 53.30 | 20.00 | 56.70 |
| Once/15days | 33.30 | 33.30 | 23.30 | 33.30 | 36.70 | 40.00 | 20.00 | 26.70 | 20.00 |
| Once/month | 20.00 | 23.30 | 26.70 | 16.70 | 23.30 | 20.00 | 3.30 | 23.30 | 3.30 |
| Once/3-4 month | 3.30 | 13.30 | 3.30 | 3.30 | 6.70 | 6.70 | 3.30 | 6.70 | 6.70 |
| Once/6months or more | 0.00 | 10.00 | 3.30 | 3.30 | 6.70 | 3.30 | 0.00 | 6.70 | 0.00 |
| p value | | 0.263 | | | 0.721 | | | 0.069 | |
| **Unhealthy snacking behavior** | | | | | | | | | |
| Daily | 3.30 | 6.70 | 13.30 | 0.00 | 3.30 | 0.00 | 0.00 | 0.00 | 0.00 |
| Often | 10.00 | 10.00 | 6.70 | 16.00 | 10.00 | 6.70 | 67.00 | 13.30 | 10.00 |
| Sometimes | 36.70 | 20.00 | 30.00 | 26.70 | 23.30 | 40.00 | 43.30 | 26.70 | 36.70 |
| Occasionally | 30.00 | 26.70 | 26.70 | 20.00 | 26.70 | 13.30 | 20.00 | 30.00 | 23.30 |
| Rarely | 6.70 | 20.00 | 10.00 | 16.70 | 16.70 | 20.00 | 16.70 | 13.30 | 16.70 |
| Never | 13.30 | 16.70 | 13.30 | 20.00 | 20.00 | 20.00 | 13.30 | 16.70 | 13.30 |
| p value | | 0.789 | | | 0.827 | | | 0.952 | |
| **Intake of Dietary supplement** | | | | | | | | | |
| Yes | 3.30 | 3.30 | 10.00 | 43.30 | 23.30 | 63.30 | 10.00 | 16.70 | 13.30 |
| No | 96.70 | 96.70 | 90.00 | 56.70 | 76.70 | 36.70 | 90.00 | 83.30 | 86.70 |
| p value | | 0.429 | | | 0.010 | | | 0.924 | |
| **Daily Tea Consumption** | | | | | | | | | |
| Zero | 46.70 | 43.30 | 43.30 | 30.00 | 33.30 | 33.30 | 53.30 | 50.00 | 50.00 |
| 1-2 Cups | 50.00 | 43.30 | 50.00 | 66.70 | 60.00 | 66.70 | 43.30 | 36.70 | 46.70 |
| 3-4 Cups | 0.00 | 10.00 | 3.00 | 3.30 | 6.70 | 0.00 | 0.00 | 10.00 | 0.00 |
| >4 Cups | 3.30 | 3.30 | 3.30 | 0.00 | 0.00 | 0.00 | 3.30 | 3.30 | 3.30 |

| | Sedentary | | | Gym Goers | | | Grass Root Level Athletes | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pre (%) | During (%) | Post (%) | Pre (%) | During (%) | Post (%) | Pre (%) | During (%) | Post (%) |
| p value | 0.712 | | | 0.820 | | | 0.376 | | |
| **Daily Coffee consumption** | | | | | | | | | |
| Zero | 63.30 | 60.00 | 66.70 | 53.30 | 60.00 | 33.30 | 63.30 | 70.00 | 56.70 |
| 1-2 Cups | 36.70 | 36.70 | 30.00 | 40.00 | 36.70 | 63.30 | 36.70 | 26.70 | 40.00 |
| 3-4 Cups | 0.00 | 3.30 | 3.30 | 3.30 | 0.00 | 0.00 | 0.00 | 3.30 | 3.30 |
| >4 Cups | | | | 3.30 | 3.30 | 3.30 | | | |
| p value | 0.851 | | | 0.274 | | | 0.717 | | |

In the sedentary individual group, meal consumption was increased during lockdown as seen in but the change was statistically non-significant (p=0.296), but significant reduction was seen in consumption of outside food (p=0.002) refer fig 3.1 and 3.2 respectively. Similar observation came from a Spanish study were dietary habits improved in terms of increased intake of fruits and vegetables during lockdown (Rodrigo, et. al.,2021). Contradicting results were obtained from another Spanish study were the dietary habits were negatively affected due to lockdown (Oscar, et. al.,2021). The change in consumption of tea and coffee in the same group was also statistically non-significant (p=0.712, p=0.851). On contrary in Vidhi et. al. (2020) study increase in consumption of tea was observed (i.e., 3-5cups per day) during lockdown.

In gym goers, there was no change in meal consumption pre, during and post lockdown (p=0.677), but significant reduction was observed in outside food consumption (p=0.00) refer fig 3.1 and 3.2 respectively. Also, there was significant reduction in consumption of dietary supplements like whey, omega 3 supplements, calcium tablets and BCAA in this group (p=0.010). In the same group no change was observed in the consumption of tea and coffee (p=0.820, p=0.274)

In grass root level athletes, increase in the meal consumption was observed during lockdown, but not significantly (p= 0.201). Same as the other two groups, there was a significant reduction in consumption of outside foods during lockdown (p=0.008). The dietary supplement consumption remained same during lockdown unlike gym goers (p=0.924). No significant change in consumption of tea and coffee was observed (p=0.376, p=0.717).

During lockdown individuals who tried to manage their physical activity levels also showed good dietary habits in terms of increased meal consumption, reduced outside food consumption, reduced unhealthy eating/ binge eating. It was also observed that participants who continued their physical activity post lockdown where also able to maintain healthy dietary habits.

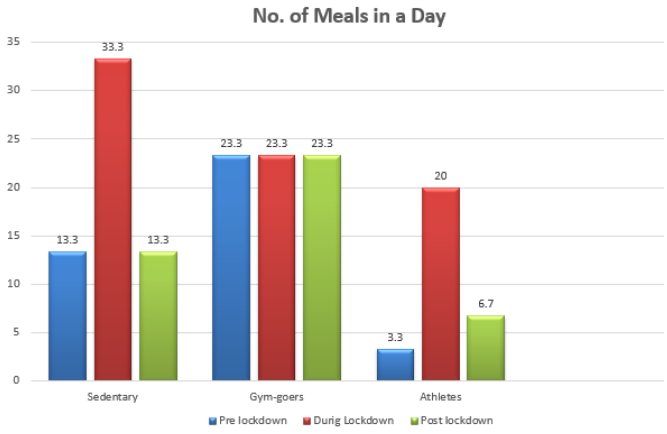


Figure 3.1

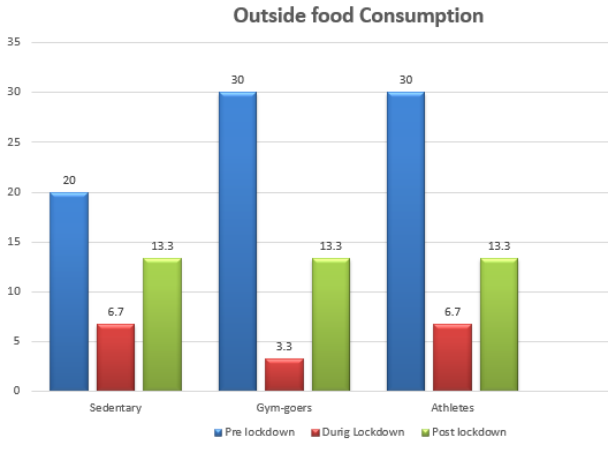


Figure 3.2

## IV. Conclusion:

In conclusion, the dietary habits of the participants among all three groups were affected due to lockdown. An increase in meal consumption was observed in sedentary individuals and athlete group. Additionally, a significant reduction in consumption of outside food during lockdown was observed in all the groups, with reported reasons including availability of time to cook, fear of illness and fear of eating outside food. Majority of participants among all three groups believed that the lockdown positively affected their dietary habits; but still felt that their dietary habits was best pre or post lockdown as compared to during lockdown. The reported challenges to maintain good dietary habits included unavailability of various food items (fruits, crud, non-veg items etc.), increased food prices and increased boredom eating during lockdown. It was also observed that participants who were active pre-lockdown were able to maintain healthy dietary habits during lockdown.

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