



Review of Eating pattern in Athletes amid COVID-19 Lock Down 1.0.

Namratha Pramod ¹

Namratha Pramod⁽¹⁾, Nutritionist, Sports Authority Of India, Netaji Subhas Southern Centre, Bangalore 560056, India

1.INTRODUCTION:

In the new age busy world, one fine day everything came to halt or rather stand still due to a new species of infectious virus known as Corona Virus Disease 2019 or COVID-19. Due to the unstoppable spread of the disease and infecting lakhs of people in 100 or more countries, it is declared as a Pandemic⁽¹⁾. The symptoms of COVID19 are similar to that of a flu, such as cough, fever, respiratory illness and in more severe cases breathing difficulties. The spread of the respiratory virus, Novel Corona virus is mainly through the droplets produced by an infected person, through sneeze or cough, saliva or discharge from nose. COVID-19 can be transmitted by 2 ways: Direct Close contact: Exposure to the infected person (within 1 meter). Indirect Contact: Touching the infected surface, clothes of infected person where the virus survives for several hours and touching one's face, mouth, eyes, nose which can transmit the virus⁽²⁾.

WHO emphasises on self-protection through regular hand wash using soap and water or using an alcohol based sanitizers frequently to stop the by chance spread of the Corona Virus⁽³⁾. This unprecedented challenge requires a coordinated global response. The government around the world have taken the route of "Lock Down to Knock Down Corona". The containment measures have reduced new cases in China more than 90% unlike in Italy and Iran⁽⁴⁾.

In India, many steps have been taken by the Ministry of health and Family welfare(MOHFW), from introducing Aarogya Setu App to stay alert and informed against COVID-19, a digital bridge to fight against COVID-19 to developing various guidelines for the public to not panic against COVID-19⁽⁵⁾. A country wide lock down was announced on March 24th for three weeks to slow the spread of COVID-19⁽⁶⁾.

Sports authority of India (SAI) has left no stone unturned for the protection of Elite and non-elite athletes in their centres all over India. Kiren Rijju held meeting with regional Directors of SAI to discuss and review the arrangements of elite athletes at Sai Bangalore and SAI Patiala⁽⁷⁾. For the athlete's safety Olympic games that were supposed to be held in TOKYO, in July 2020 announced its postponement to August 2021⁽⁸⁾.

Athletes have special diet requirements during training, recovery and rest phases. The nutritional needs of the athletes also vary due to type of sport played, physical activity and conditioning. Athletes have restrictive eating behaviour. They are always under the pressure to maintain their weight and perform their best. Dietary fads are also common in the athletes, peer pressure being one of the reason. A Sports nutritionist educates and helps athletes to improve their eating habits. A Sports nutritionist considers psychosocial factors that can influence their eating behaviour⁽⁹⁾. During the Lock Down its very important to look into their nutritional behaviour in order to achieve optimum performance. Emphasis on nutritional education is very important as non-elite multisport athletes do not meet the recommendations of carbohydrate also⁽¹⁰⁾. To improve college athletes eating habits and dietary intakes effective nutrition interventions are required⁽¹¹⁾. The impact of nutritional knowledge of athletes on their dietary intake is equivocal⁽¹²⁾.

2.METHODOLOGY

Study Design

Sample Selection: Study was done using a well-planned questionnaire. Study was carried out through filling of google forms due to Social Distancing during COVID-19 lock down. 128 participants were included based on their willingness to participate in the study. Among 128 participants, 67 were men athletes and 61 were female athletes. The participants were between the age group of 20 – 35 years. The athletes are a part of SAI, NSSC, Bangalore. Dietary habits and pattern were assessed. Physical activity and their training schedules were also looked into. Stress was also studied during the lock down phase. Approval was obtained from the management, before initiating the study and consent was taken from the participants.

Somatic Status: Anthropometric Measurements - Height (cm), Weight (kg) were collected in the google forms.

Dietary habits: The google forms included the dietary intake of all the participants. Other details like type of certain food groups consumption before and during the lock down were studied. Online ordering was also looked into as Zomato and Swiggy had resumed their services halfway through the lockdown.

Interpretation and Analysis of the data: Keeping the objectives in mind, the data collected was compiled tabulated for the appropriateness of analysis. The data was statistically analysed using appropriate statistical tests of significance and results were then interpreted; appropriate conclusions were drawn.

3. RESULTS AND DISCUSSION

The study was conducted through google forms keeping in mind the Social Distancing during COVID-19 Lock down. The study consisted of 128 participant athletes, out of this 67 were male and 61 were female (Table 1).

Among the athlete participants majority (95%) of the athletes about 122 were in between 20 – 25 years of age, (45%) about 5 were between age group 26-30 and only 1 athlete (15) was in between 31- 35 years (Figure 1).

In an athlete's diet the sport the athlete is into makes an important factor to be considered. In the study the participants were of various sport discipline. One third of the athletes, n=42 were from gymnastics(33%) almost one third (31%) were from handball n=40. The rest of the one third were from different sports like taekwondo(n=15), hockey (n=9), kabaddi (n=7), rhythmic gymnastics (n=8), athletic (n=3), badminton(n=2) and artistic gymnastic (n=1).(Figure 2).

Sri Narendra Modi ji announced India lock down on March 24th, 2020. Faridabad's transitional health and Science Executive director took twitter to appreciate the move as "right move, just in time"⁽¹³⁾. For the athletes safety Sports authority of India (SAI) had announced all the National Centre of Excellence athletes to go home and stay home for safety. The lock down period was studied. More than half(54%) n=69 were in lockdown for 16 – 20 days, almost half (43%) n= 55 were in lockdown for 10 – 15 days and only (3%) n= 4 athletes were in lock down from 6 – 10 days as in figure 3.

Even during the lock down period more than half (58%) n= 74 were working from home where as the rest n=54 was not involved in any work from home. (Table 2)

The athletes were in lockdown period in their home or hostels. Time spent on gadgets were monitored. The most vulnerable group for gadget dependency is the youth. The dependency can become an addiction to technology without knowledge ⁽¹⁴⁾. 53% (n=68) used these gadgets between 2-4 hrs.33% (n=42) Of them used it for less than one hour. Only 5% (n=6) used it for more than 6 hrs.(Figure 4)

The athletes were spending the free time in various other activities. A study done on youth of Helsinki, showed that when you hang out with friends it's a good and easy way to learn and practise something new that you have never tried before. The study also quotes that practising something new or your hobbies can also reduce the negative feelings within one self.⁽¹⁵⁾.31% (n=40) spent time on social media,22%(n=28) of them tried some new hobbies like painting, singing etc. 20% (n=25) spent time reading books, a rare one these days.8%(n=10) spent time relaxing and sleeping. (Figure-5)

Vegetarianism in athletes were lesser seen in the athletes about 20%(n=25), about three fourth of the participants studied were non vegetarian, 75%(n=96). Very less athletes, 5%(n=7) were found to be ova vegetarians, those who consume eggs but no other form of meat, fish etc. (Table -3)

The study aims at understanding eating pattern of the athletes of different foods before amid during COVID-19 Lockdown. Nutrition education in athletes showed increased ability in nutritional knowledge. It also showed self efficiency and improvement in positive dietary changes.⁽¹⁶⁾

In non vegetarians a strange pattern was observed. Athletes who consumed non veg thrice a day had marginally increased(n=10 to n=14). Those who consumed once a day had reduced drastically from 33%(n=42) to 7% (n=9). Athletes had started to use non veg only once a week hence the graph shows and increase from 25%(n=32) to almost double 52%(n=66). (Figure 6)

Paneer consumption amongst vegetarians showed a decrease in daily consumption, athletes who ate paneer twice a week 12%(n=16) had reduced to 5%(n=6). Those who consumed weekly once were almost in the same ratio 74%(n=95) to 78%(n=100.) (Figure 7).

Fruits and vegetables are rich sources of antioxidants. Antioxidants are compounds that fight against free radicals in the body, which causes the several damages to the body including reduction in immunity, body ageing etc. Sufficient supply of antioxidant rich foods in young athletes showed beneficial effect. It also reduced the oxidative stress⁽¹⁷⁾.

Figure 8 and 9 shows the reduced consumption of fruits and vegetables of the athletes. This may be reasoned due to the lock down and unavailability of the fruits and vegetables of their choices like before. Athletes who consumed fruits everyday had reduced to 25%(n=32) from 52% (n=66). Instead of daily weekly consumption had increased from 9% (n=11) to 23%(n=27). Vegetable consumption also had dropped down to nearly half in the athletes. Athletes who consumed vegetables everyday either in the form of salads, vegetable preparations or steamed vegetable before lock down were about 52% (n=67) and during lock down was 28%(n=36). Those who consumed weekly once showed a sharp increase from 9% (n=11) to 23% (n=24) during the lock down.

Dairy plays an important role in an athlete's diet. It has many benefits including the bioactive compounds that support muscle anabolism. Dairy also is a good source of protein, calcium and vitamin d for the athletes. Dairy consumption along with resistance exercise helped in fat loss, maintenance or gains of lean muscle mass and bone preservation in athletes⁽¹⁸⁾. Athletes dairy consumption showed marginal changes before and during the lock down period. (Figure 10). 32% (n=41) used to have dairy twice a day before lock down reduced to 18% (n=24) during lock down. More athletes were consuming dairy every day. 50% (n=63) athletes consumed dairy every day before lock down increased to 60% (n=77) athletes during lock down.

Athletes snacking pattern plays an important role in their nutrient intake be it the carbohydrates, fats or micro nutrients like iron or calcium. A study on snacking behaviour of athletes revealed that it contributed to nearly one fourth of the total energy intake. More snacking pattern was seen on the training days than the rest days⁽¹⁹⁾. Snacking amongst the athletes reduced from 61% (n=79) to 43% (n=56) (Figure 11). The athletes were aware of the healthy snack options, they were occasionally having junk foods like chats (12%, n=15) where as they mostly preferred healthy options like fruits (46%, n=59), dry fruits (16%, n=21). Figure 12.

Water consumption of the athletes is an important strategy to improve their performance and reduce risk of injuries. The performance of an athlete can be compromised and risk of exertional health injuries are increase in case of dehydration. Increasing accessibility, optimizing palatability and education can increase drinking behaviour of athletes⁽²⁰⁾. Figure 13 represents the water consumption of athletes both before and during the lockdown phase. 33% (n=42) of the athletes consumed 3-4 litres before lock down and 31% (n=40) during the lock down. Water consumption pattern did not vary much during both the periods.

Online ordering is a common practice amongst youngsters. It is at ease of their home. In India food delivery applications has become a major hit. Anyone can download the app on the mobile and start placing orders of food. Some of the famous apps in India are Zomato, Swiggy and Uber eats. However due to COVID-19 lock down these food deliveries had stopped. However, realising the need for those who stay in PG or who do not have cooking provisions, these apps started to function again. The athletes presented a low percentage of ordering food from these apps both before (76%, n=19) who ordered once a week and during the lock down were none, after these companies resumed services.

Athletes are supposed to train throughout the year. Even during off season, some exercises and conditioning are important to enhance performance on season too. Some tests like single leg hop, standing long jumps improved in athletes who were continuing off- season training⁽²¹⁾. The athletes had active training even during the lock down period at home. Majority of them 70%(n=89) trained during the unexpected COVID-19 lockdown1.0 at home. (Table 4)

Sports Minister Kiren Rijiju posted on Instagram as "SAI is promoting #FitIndiaMovement during the 21-Day lockdown. I appeal everyone to take up this simple exercise of Skipping Rope (रस्सी कूदना) at home. You can share it too. let's unite online, while maintaining social distance". Figure 14 and 15 shows athletes were involved in various activities like yoga 40% (n=51), Skip a rope 23% (n=29), solo walks 14% (n=18). About 35% (n=45) trained between 1 – 2hrs daily, about 12 % trained about 2-3 hrs (n=16) and less than 1 hour (n=15) daily.

Circadian Rhythms or sleep/ wake cycles are very important for human performance. Sleep also plays a role in rest and recovery of the athlete. Important biological process such as hormone production, cell generation, brain activities are determined by this cycle. Athletic performance dependency on quality and quantity of sleep⁽²²⁾. Athlete's were having good amount of sleep. (0% of the athletes had sleep more than 6 hrs every day. Majority of athletes 51%(n=65) had 6- 8 hrs of sleep, 40 % (n=51) had 8-10 hrs of sleep (Table 5).

Stress can have a direct impact on athlete's performance. Stress can have impact on even daily activities of the athletes. A study states that stress score can be a predicted from mood scores like vigour, depression and tension⁽²³⁾. The unpredicted lock down due to COVID-19 has caused stress amongst all individuals. Stress pattern was studied amongst athletes .70% (n=90) showed moderate stress and 20%(n=25) showed less stress (Table 6). The athletes were involved different hobbies and activities to keep them occupied through the lock out period along with minimal training. (Figure 15). 22% (n=28) started practising a new hobby.20% (n=25) spent time on reading a rare hobby however. 32% (n=40) spent time on social media.

4. CONCLUSION:

Good health and good nutrition always go hand in hand. Importance of good nutrition among sports person has become a branch itself. Sports nutrition helps and athlete to attain a right body composition, increase performance, aid in better recovery. Our very own Indian track Superstar, P T Usha explained the importance on nutrition for an athlete. She told in an interview with Hindustan times that back in 1984, she was only on a rice and pickle diet in Los Angeles. This made her miss a medal by one-hundredth of a second. She could not sustain the energy level due to restricted diet and limited knowledge of the diet. Sports nutrition importance is well explained by Tracy R. Ray and Rachel Fowler. They explain that proper nutrition is essential to staying healthy during a run, a draining practise or as a year-round philosophy to perform maximally and to avoid or recover from an injury⁽²²⁾. Nutrition adaptations are mostly used the concepts in the field of sports nutrition. An athlete's performance can be amplified or reduced by nutrition. Training the gut reduces the negative effects of dehydration. Factors such as poor nutritional knowledge, frequent travelling, diet extremism hinder the sports performance. Nutrition education must be practical with easy food and fluid choices⁽²⁴⁾.

The study revealed that the athletes were well informed on the nutritional periodisation during a reduced training period or intensity. The athletes were able to manage their eating pattern from home/ hostel. Due to the unavailability of all the food groups and as required, the athletes managed to have easily available options. The athletes reduced a few items like non veg and paneer considering the reduced need of protein. Fruits and vegetable consumption also reduced and were limited to the available ones. The athletes consumed dairy every day to aid better recovery. Snacking was also controlled due to limited training schedule. Water consumption was the same. This prevents dehydration of the athletes, also considering the season being summer. The athletes made the most of the free time and indulged themselves in healthier habits like reading, developing a hobby. These skills also kept the stress of the athletes at check. Nutrition education has tremendously helped the athletes to make wise choices of the diet. The athletes must be appreciated for the healthy eating pattern they followed Staying at Home, Staying Safe.

ACKNOWLEDGMENT

I would like to thank our Senior Director, Captain Ajay Kumar Bahl for allowing me to do the study in SAI. I would like to extend my thanks to Mr. Satish Kumar (AD, NCOE) for the spontaneous action in permitting me to do the study. I would like to thank Dr. Saju Thomas (HPD) and Dr. Manilal (Head of Sports science Department) for their support. I would like to thank

all our coaches in SAI, NSSC, Bangalore and the athletes who agreed to participate in this study without whom the study would not be possible.

FOOTNOTES: Conflicts of Interest: None

List of Tables

Table 1: Gender of the athletes

Gender	
Male	52% (n=67)
Female	48%(n=61)

Table 2: Work from home pattern of the athletes

Working from home	
Yes	58% (n=74)
No	42% (n=54)

Table 3: Food preference of the athletes

Food preference	
Vegetarian	20% (n=25)
Non – vegetarian	75% (n=96)
Ova- vegetarian	5% (n=7)

Table 4: Training of athletes during lockdown at home

Training during lockdown at home	
Yes	70% (n=89)
No	30% (n=39)

Table 5: Sleep hours of Athletes

Hours of Sleep	
less than 6 hrs	5% (n=7)
6-8 hrs	51% (n=65)
8- 10 hrs	40% (n=51)
more than 10 hrs	4% (n=5)

Table 6: Stress of athletes

Stress during lock down	
Less stressed	20% (n=25)
Normal	70% (n=90)
More stressed	10% (n=13)

List of Figures

Figure 1: Age distribution of athletes

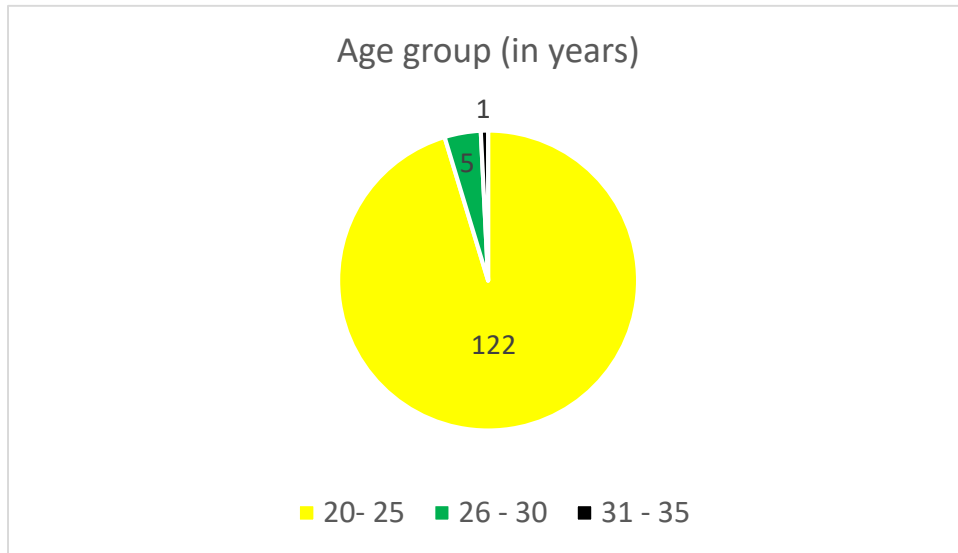


Figure 2: Sports Discipline of athletes

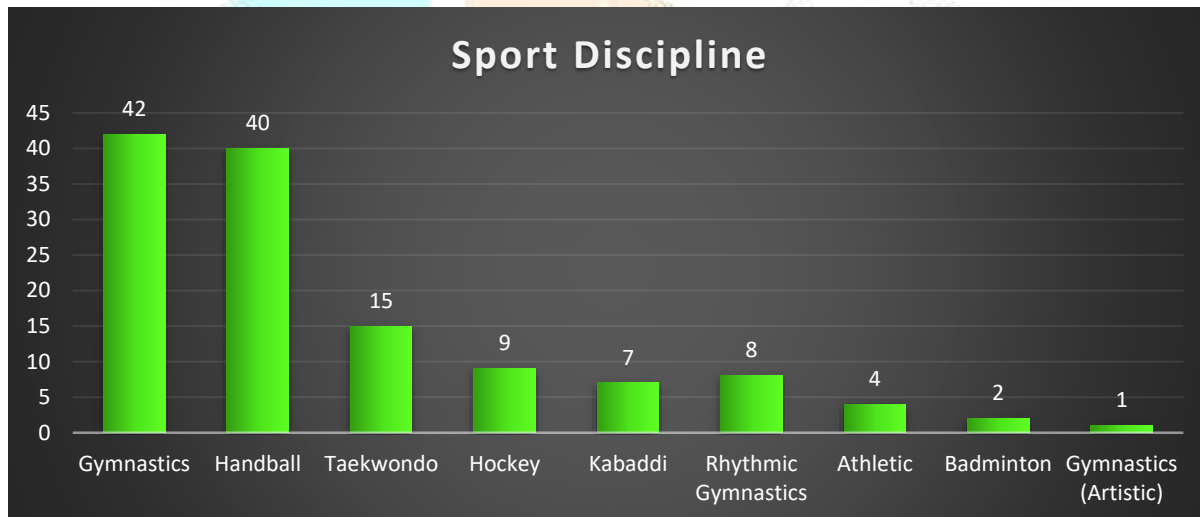


Figure 3: Period of lock down of athletes

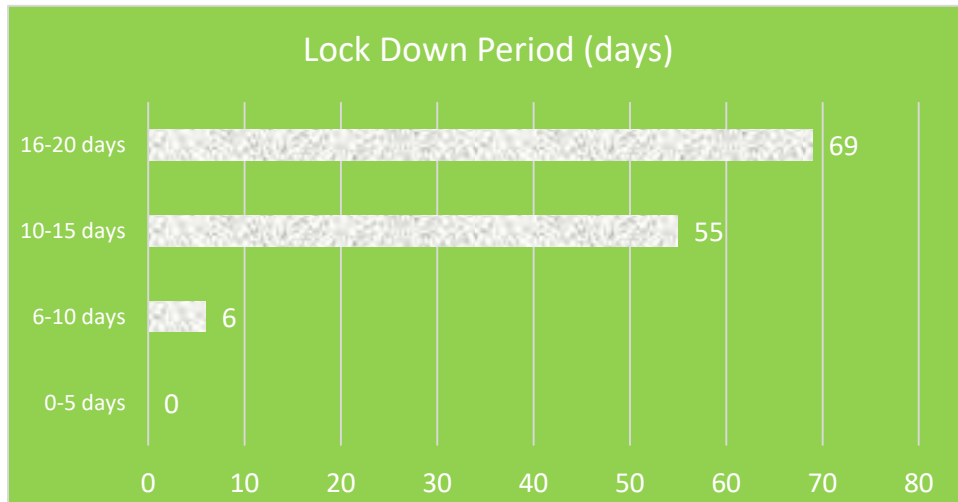


Figure 4: Time spent on gadgets by athletes

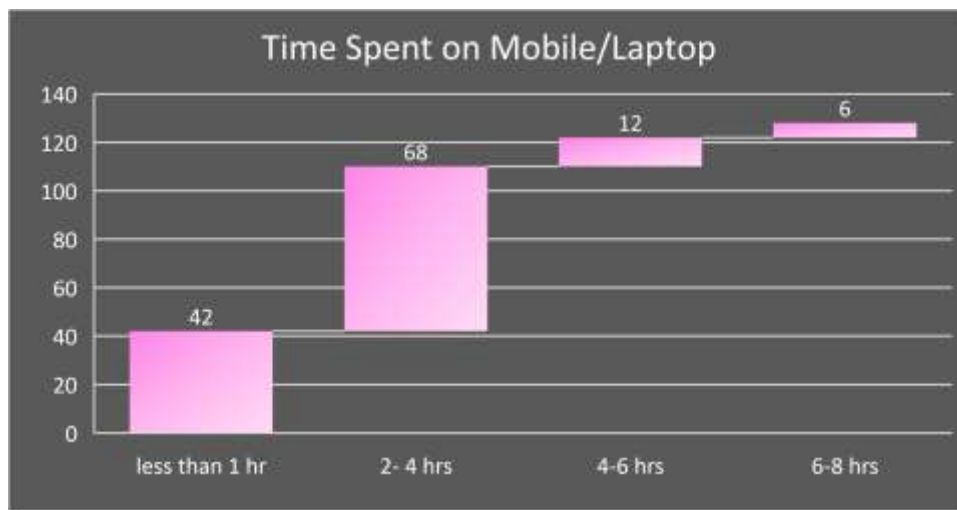


Figure 5: Time spent by athletes with various activities

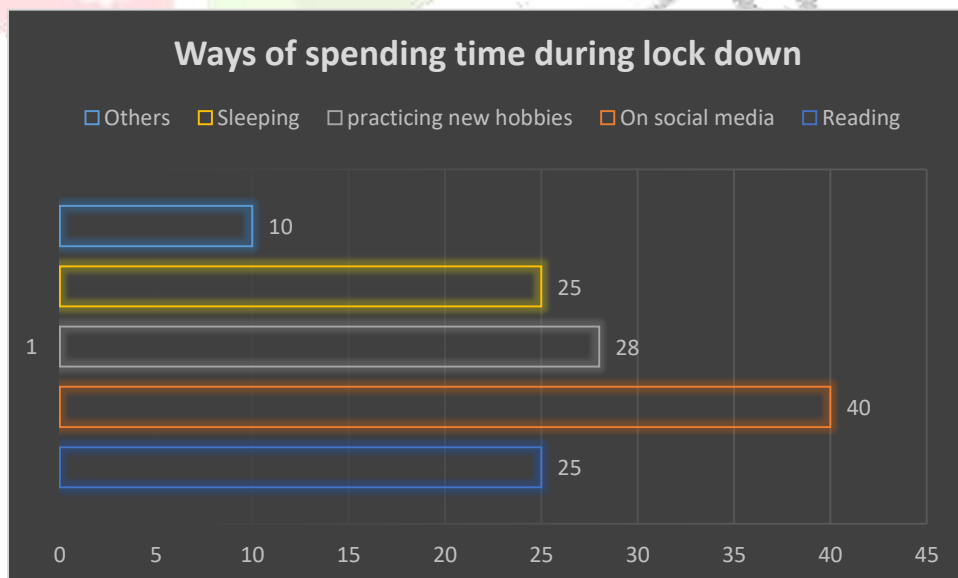


Figure 6: Non veg consumption of athletes

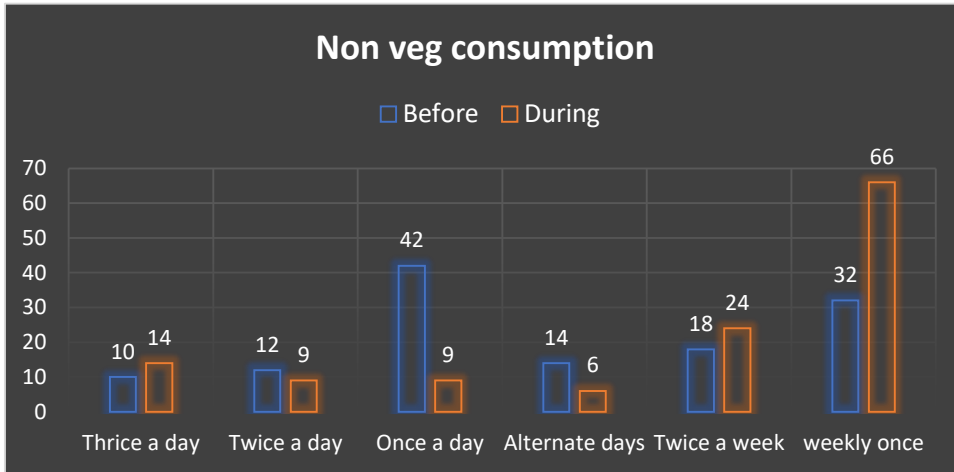


Figure 7: Paneer consumption of athletes

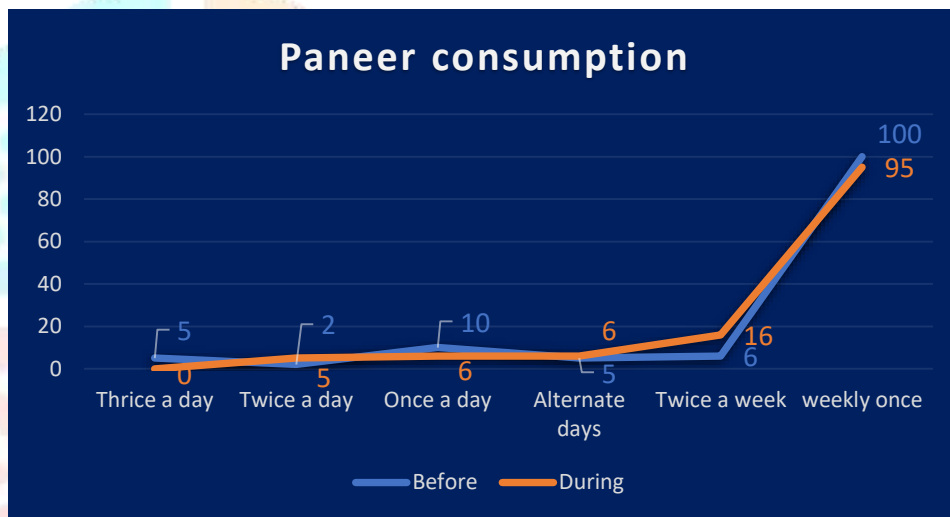


Figure 8: Fruit consumption of athletes

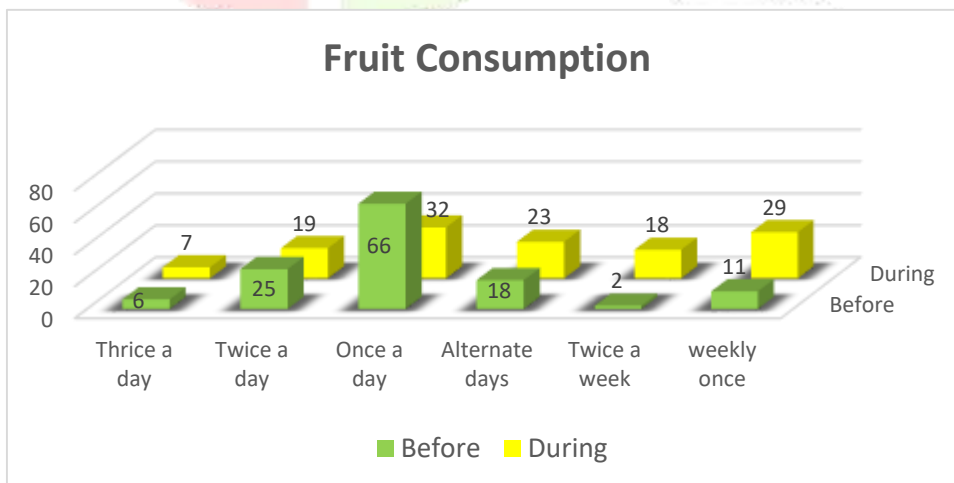


Figure 9: Vegetable consumption of athletes

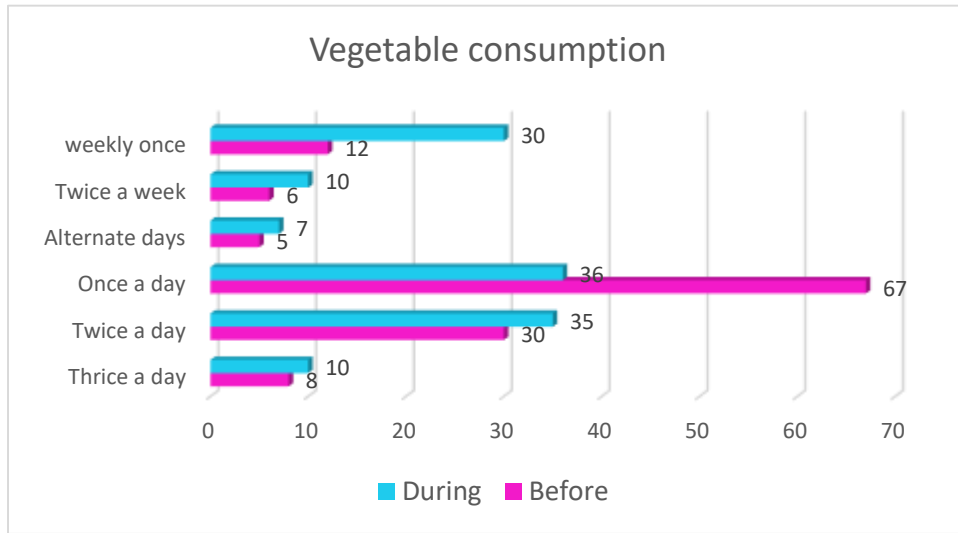


Figure 10: Dairy consumption of athletes

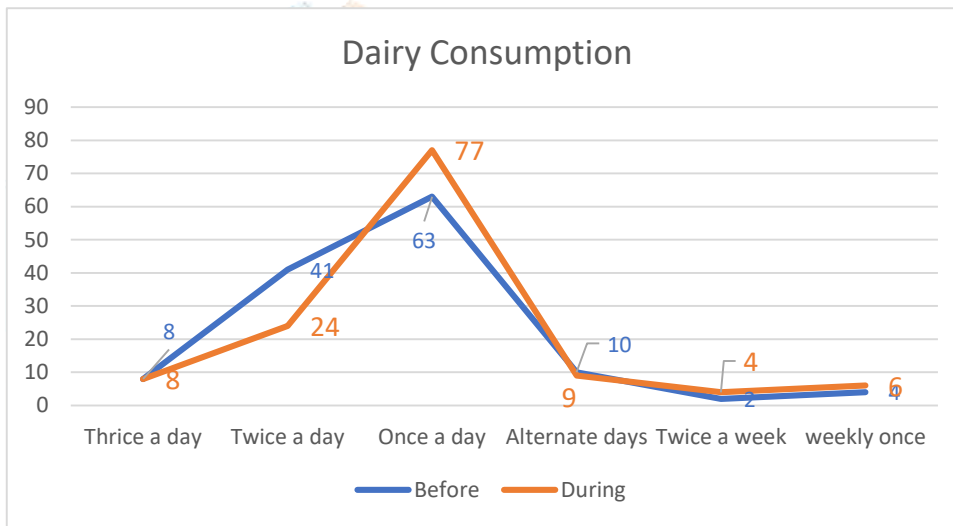


Figure 11: Snack consumption of athletes

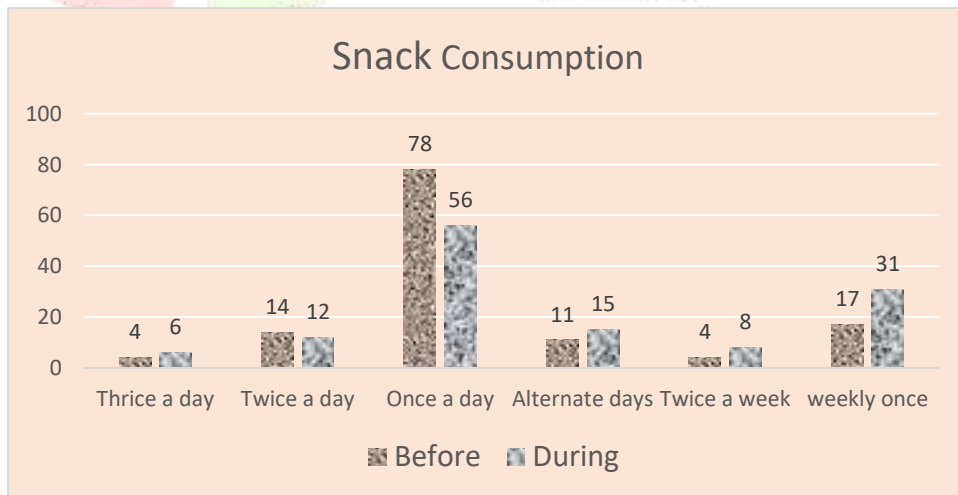


Figure 12: Snack consumption of athletes during lock down 1.0

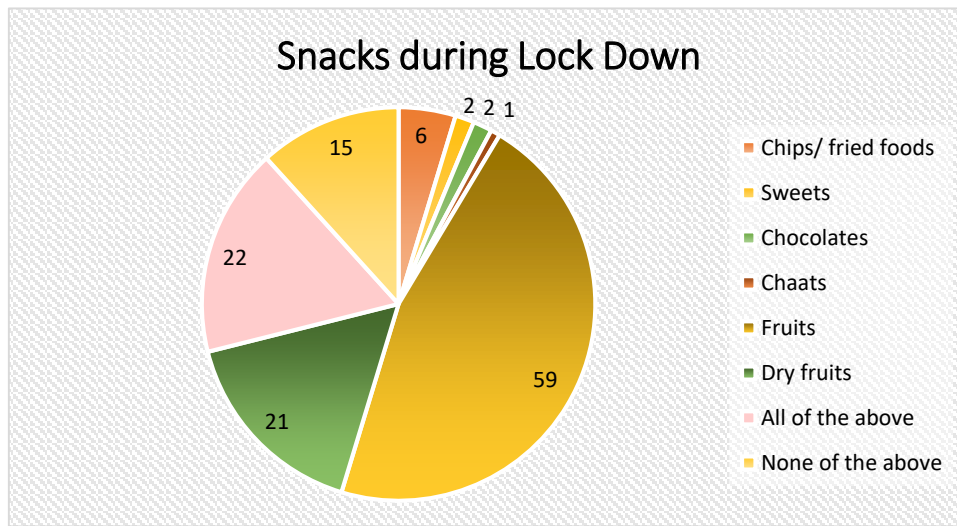


Table 13

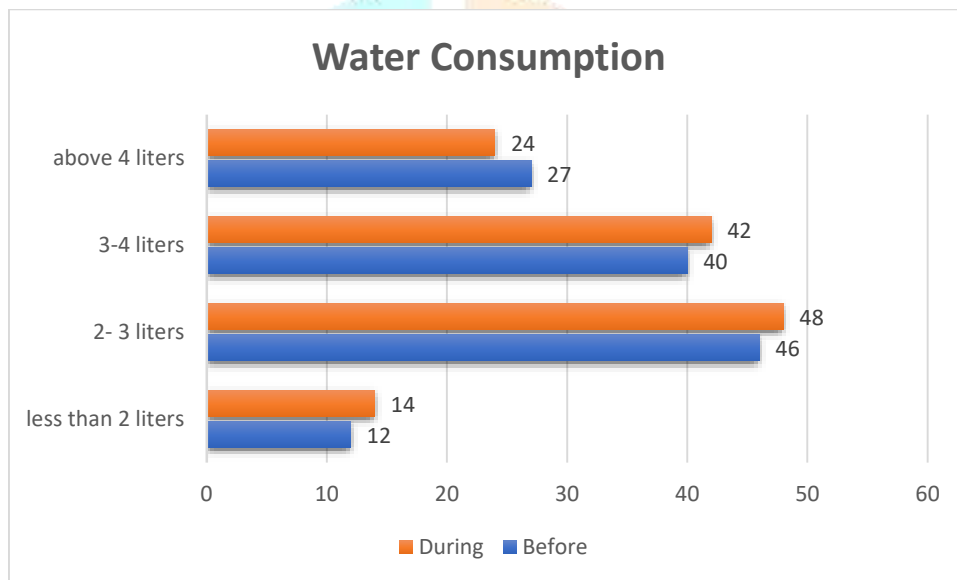


Figure 14: Training hours of athletes at home

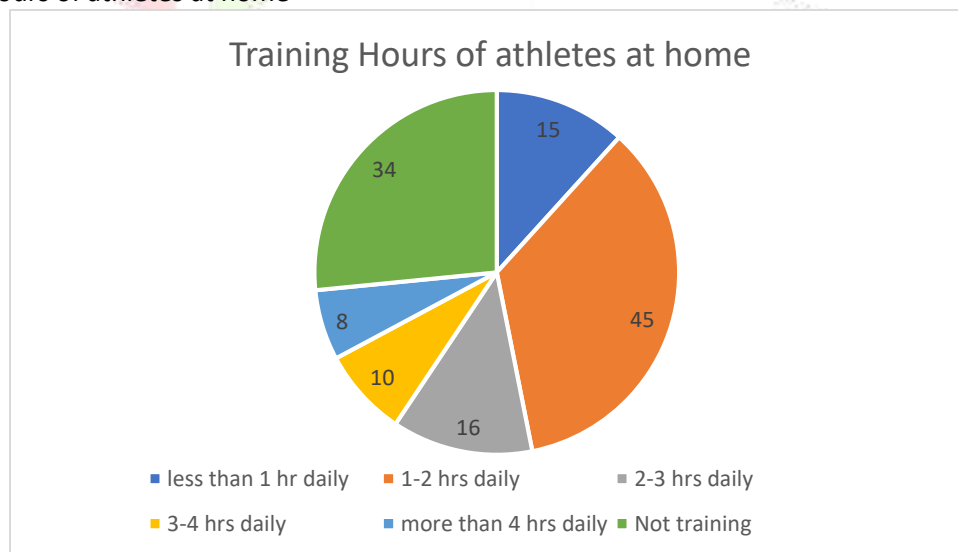


Figure 15: Exercise routine during lock down at home

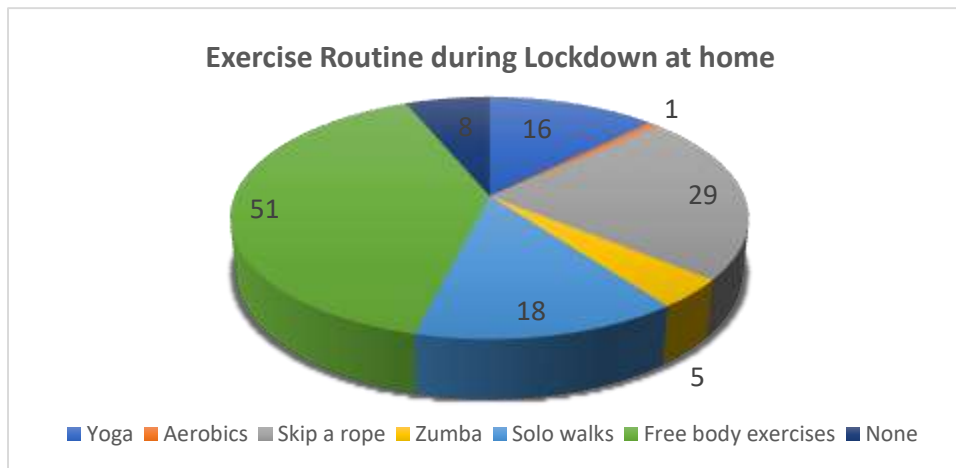
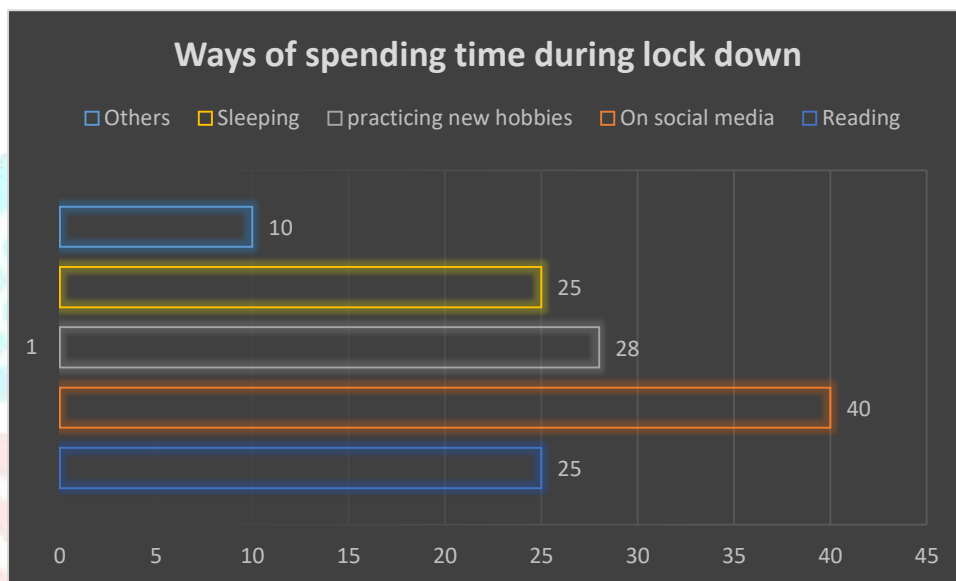


Figure 16: Ways of spending time at home during lockdown



REFERENCES:

1. E Callaway Time to use the p-word? Coronavirus enter dangerous new phase Nature, 579 (2020), p. 12. View Record in Scopus Google Scholar
2. <https://www.mohfw.gov.in/pdf/PreventionandManagementofCOVID19FLWEnglish.pdf>
3. Myth busters. www.who.int › diseases › novel-coronavirus-2019 › advice-for-public
4. The Economist Tourism flows and death rates suggest covid-19 is being under-reported <https://www.economist.com/graphic-detail/2020/03/07/tourism-flows-and-death-rates-suggest-covid-19-is-being-under-reported> (2020), Accessed 11th Mar 2020
5. <https://webcache.googleusercontent.com/search?q=cache:Q7S18eyhhpgJ:https://www.mohfw.gov.in/>
6. Priyanka Pulla. Covid-19: India imposes lockdown for 21 days and cases rise. BMJ 2020;368:m1251 doi: 10.1136/bmj.m1251 (Published 26 March 2020)
7. ANI Updates, 7th April. 2020. Kiren Rijju holds meeting with Regional Directors of SAI amid coronavirus crisis Cheteshwar Pujara pledges support for COVID-19 relief
8. <https://tokyo2020.org/en/schedule/>

9. Jean Storlie. International Journal of Sport Nutrition and Exercise Metabolism.
10. Geneviève Masson, Benoît Lamarche. Many non-elite multisport endurance athletes do not meet sports nutrition recommendations for carbohydrates.
11. Lenka H. Shriver; Nancy M. Betts, Dietary Intakes and Eating Habits of College Athletes: Are Female College Athletes Following the Current Sports Nutrition Standards?
12. Susan Heaney, Helen O'Connor, Scott Michael, Janelle Gifford, and Geraldine Naughton. Nutrition Knowledge in Athletes: A Systematic Review
13. Priyanka Pulla. Covid-19: India imposes lockdown for 21 days and cases rise. BMJ 2020;368:m1251 doi: 10.1136/bmj.m1251 (Published 26 March 2020)
14. Muduli, J R. Addiction to technological gadgets and its impact on health and lifestyle: a study on college students.
15. Miska Halén. Experiences of Hobbies among the Youth (Bachelors Thesis).
16. Doris A. Abood EDD, CHES^a David R. Black PHD, HSPP, CHES, MPH, CPPE, FASHA, FSBM, FAAHB^b Rachel D. Birnbaum MS^a Nutrition Education Intervention for College Female Athletes
17. Carlsohn A, Rohn S, Mayer F, Schweigert FJ. Physical activity, antioxidant status, and protein modification in adolescent athletes.
18. Lamprecht, M. (Graz) Impact of Milk Consumption and Resistance Training on Body Composition of Female Athletes
19. Kenny Anne Erdman, Jasmine Tunnicliffe. Eating patterns and composition of meals and snacks in elite Canadian Athletes.
20. Douglas J. Casa, PhD, ATC, CSCS (Chair),* Lawrence E. Armstrong, PhD, FACSM,* Susan K. Hillman, MS, MA, ATC, PT,[†] Scott J. Montain, PhD, FACSM,[‡] Ralph V. Reiff, MEd, ATC,[§] Brent S. E. Rich, MD, ATC,^{||} William O. Roberts, MD, MS, FACSM,[¶] and Jennifer A. Stone, MS, AT. National Athletic Trainers' Association Position Statement: Fluid Replacement for Athletes
21. Jason Brumitt, PT, PhD, ATC, CSCS,^{1,2} Bryan C. Heiderscheid, PT, PhD,³ Robert C. Manske, DPT, MEd, SCS, ATC,⁴ Paul E. Niemuth, PT, DSc, OCS, ATC,⁵ and Mitchell J. Rauh. Off-season training habits and preseason functional test measures of division iii collegiate athletes: a descriptive report.
22. Damien Davenne Sleep of athletes – problems and possible solutions
23. Tracy R. Ray and Rachel Fowler. Current issues in sports nutrition in athletes.
24. Asker E Jeukendrup. Periodized Nutrition for Athletes.
25. Louise Burke. Practical issues in nutrition for athletes.