

Survey on nutritional status of school students during COVID-19 lockdown

Rishit Khinduka & Rashmi Shrivastava

Jayshree Periwal International School, Jaipur, India

Abstract

The COVID-19 virus was primarily observed in human population in December 2019 and it was very soon infected people across the world. COVID-19 was declared as a pandemic by World Health Organization. It affected the world in all aspects of life. A lot of attention was paid on immunity and preventive measures of COVID-19 but lifestyle of normal healthy school students who were staying at home first time for such a long duration was ignored by most of the researchers. Therefore, present study aimed to highlight the consequence of lockdown & COVID-19 amongst the school students in Rajasthan, India of the age ranging from 14 to 25. A cross sectional online survey was conducted using Google forms. A total 200 responses were collected. It was found that long home stay caused unusual craving and eating energy dense foodstuffs that led to more than 20% weight gain during last one year in 75% students.

Key words

Weight gain, Food habits, COVID-19, Pandemic, Student, Rajasthan

Introduction

Corona virus disease is a kind of pneumonia that occurs due to corona virus. It was first identified in Wuhan, China on 31 December 2019 (Hui *et al.*, 2020). Very soon Covid - 19 diseases was declared as a Public Health Emergency all over the world. World Health Organization named it as COVID-19. Corona virus was originated by the family *Coronaviridae*. It is a single-stranded, positive-sense RNA viruses. Scientists named this virus as 'corona' in the year 1960 because it contained crown shape protein. In 2003, 2012 and 2015, there were outbreaks of the corona virus. In China, its outbreak in 2003 was termed as 'Severe Acute Respiratory Syndrome' (SARS); Saudi Arabia faced it in 2012 (Chen *et al.*, 2020); South Korea was affected in 2015 (Killerby *et al.*, 2020) & the disease was identified as 'Middle East Respiratory Syndrome' (MERS) (Willman, 2019). Widespread outbreaks of COVID-19 are associated with physical as well as degradation of mental health (Wang *et al.*, 2021). This worldwide pandemic had remarkable effect on the psychological health and quality of life of the affected patients & their families and remained for a prolonged period even after the outbreak [IASC, 2007]. The pandemic has caused a huge effect on all the lived across the strata. Be it health care professionals or infected or quarantined patients, the social sustenance system has been deeply affected (Tol *et al.*, 2011; Kang *et al.*, 2020).

Not only just because of COVID-19 itself, but also the conditions of home isolation or lockdown also contributed to significant changes to daily lives as the movement was restricted in support of efforts to contain and slowdown the spread of the virus. People faced new normal of work from home, unemployment, online studies of school students and lack of physical activity. So it was very important to study effect of this new normal on health of students.

Till now the existing literature is not enough to understand effect of COVID-19 on human lives of lower age groups that can be done through more extensive clinical experience and research. Various publications in 'The Lancet' have reported the clinical symptoms of COVID-19 patients and forecasted its worldwide spread also (Brooks *et al.*, 2020, Chan *et al.*, 2020 and Huang *et al.*, 2020). A lot of research work has been done on medicines & vaccine development of COVID-19. Still there are limited studies that have investigated the impact of COVID-19 on nutritional status of Indian population especially on the students. Therefore, the present study aimed to investigate whether there was an immediate effect of the COVID-19 pandemic or its related lifestyle habits on nutritional status of Indian students especially in a particular region (Rajasthan) during the lockdown and travel restrictions imposed by the government.

Research Methodology

It was a cross-sectional, observational study executed in Rajasthan. For the data collection, a quantitative method that is a survey was used. A Google form was designed in the form of an online semi-structured questionnaire. After the questionnaire was completed a link was created in the Google form. Further, a message was drafted which had the instruction of how to fill the survey, eligibility of the participant (14 to 25 years), purpose of the survey with the link to the survey. Once the student decides to take the survey, on clicking the link they were redirected to the form that had a set of questions related to awareness, food habits during lockdown, physical activity & nutritional status etc. The link was forwarded to the students of the age group 14 - 25 through email, social media like WhatsApp, Instagram. Sample selection was done using 'The snowball' sampling technique. The participants were requested to forward the message to as many as students of age group 14-25 as possible. So, each participant shared it with 2-3 students which created a chain that helped in collection of data. Using this methodology, it was possible to collect data from various cities of Rajasthan.

Inclusion criteria

1. As this was an online study, students should have access to an internet connection and electronic devices
2. Student should be between the age group of 14-25 years
3. Students should understand English.
4. Who are willing to participate & give their feedback

Exclusion criteria

1. Who are >25 & < 14 years of age
2. Who don't understand English
3. Who don't have access to internet & electronic devices
4. Who didn't provided timely feedback

The survey had 20 multiple choice questions which were mandatory to answer followed by 4 5-point Likert scales which were also mandatory to answer. The study was divided into four parts: awareness, types of foods eaten, physical activity and nutritional status. For awareness, there were 5 multiple choice questions followed by 1 5-point Likert scale. For types of foods, there were 5 multiple choice questions along with 3 5-point Likert scales. For the physical activity, there were 5 multiple choice questions and for nutritional status also there were 5 questions for which they need to enter their data for height, weight, waist circumference, hip circumference and weight gain. Reference height of Indian adolescents in the age group 14-25 years of age is 160-175 cm for boys & 155-160 cm for girls.

Reference weight is 48-62 kg for boys & 46-55 kg for girls (RDA, 2020). Normal waist circumference is <90 for male & <80 for female (Vijayanchali, 2014). WHR should be <.9 for male & <0.8 for female (Kowsalya & Parimalavalli, 2014).

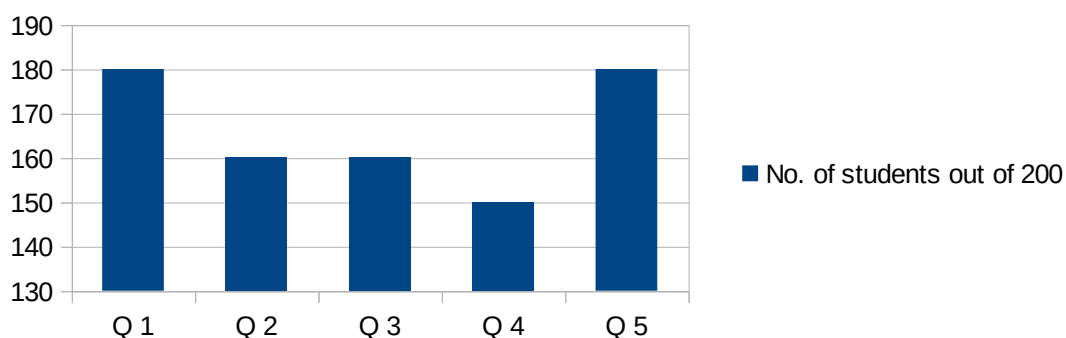
Result and discussion

In the pandemic of COVID-19 people faced many difficulties, which unfavourably influenced their lives. Its consequences are severe that have influenced our nutritional well being also in a negative manner. Results & discussion part has been divided into 4 parts:

1. General awareness of COVID-19
2. Types of foods eaten during lockdown
3. Physical activity
4. Nutritional status

1. General awareness of COVID-19

The participants had a moderate degree of awareness regarding the symptoms, prevention, precautions and reliable source of information. Question 1 was about hand hygiene for which 180 out of 200 students provided correct responses. For question 2 & question 3 were for respiratory hygiene & awareness on authentic source of information for which 80% students showed their awareness. Question 4 was for awareness of symptoms of COVID-19, for which 75% students gave affirmative answers. Question 5 was for awareness regarding authentic source of information in which willingness for vaccination. For this, 90% students choose the option that vaccination should be compulsorily done (Graph 1). This awareness about present situation of COVID-19 can be attributed to mass media like newspapers, mobile apps, social media (whatsapp, facebook etc)



2. Types of food eaten

Students were given 5 questions about type of food item preferred during lockdown.

Question 1 How many times did you order outside food from online home delivery restaurant apps? - In it's response, 70% students replied that on an average fortnightly they did so.

Question 2 How many times you had fried food items prepared at home? 60% students responded at least once per week.

Question 3 How many times did you had junk food like pizza, pasta, burger, chow mien etc prepared at home? - In its reply, 65% students responded that they had these types of food items at least twice a week.

Question 4 How many times you had cakes/ jalebi / desserts at home? 70% of students responded that they had cake etc. at least fortnightly

Question 5 How much water they drank per day? 80% of students replied 2 L per day.

These types of food choices can be understood by the fact that students were in stress by the impact of this widespread disease. They were staying at home for around one year with their families as schools were closed due to lockdown & online teaching pattern was followed as per guidelines. They had cravings to eat something all the time because of stress or because of more free time at home when they didn't have any specific goal/ activity to do. In this situation, the food/ preparation of different types of delicious foodstuffs not only fulfilled their hunger/ craving but also it was a mode of stress reliever that diverted their mind from negativity of COVID-19. It provided them a feeling of cheerfulness and positivity.

3. Physical activity pattern: Five questions were prepared in this category.

Question 1: At what time did you woke up? In this 70% (140 out of 200 replied that they woke up at 7 – 8 'o'clock.

Question 2: At what time did you when to sleep? -160 students responded that they slept between 11 pm - 12 am.

Question 3: Did you do any morning/ evening walk at home: - 98% students responded that they didn't do this.

Question 4: Did you spent some time on exercise/ Yoga at your home ?- In its reply, 50% students replied that they didn't had any exercise during lockdown.

Question 5: Did you spent any time in household chores like brooming/ mopping/ gardening etc at your home? - Seventy percent of students replied that they didn't do these types of activities. It can be described due to restricted movement outside their home in order to prevent the spread of the disease in lockdown and schools were closed, they had to sit at one place for online classes, students had very less physical activity during lockdown.

4. Nutritional status: In this category also, following 5 questions were asked from students.

S.No.	Question	Response
1	What is your height?	Average 155 cm
2	What is your weight?	Average 65 Kg
3	What is your waist circumference?	85 cm for male & 78 cm for female
4	What is your hip circumference?	90 cm for male, 85 cm for females
5	Increase in weight during last 3 months	Between 2- 4 kg average

From the above data, average Body Mass Index & waist-to-hip ratio was calculated that was found 27.08 kg/M² (average BMI), 0.94 (boys) and 0.91 for girls.

The BMI was found in category of obesity (Snehlata *et al.*, 2003). Bacopoulou *et al.* (2015) and Romaguera (2010) also stated that diet is directly related to waist circumference and adiposity. A number of other studies have been done on waist circumference and obesity in Indian population (Misra *et al.*, 2006; Khalidkar *et al.*, 2014; Lalitha *et al.*, 2016)

Conclusion

From the above data, it is clear finding that lack of physical activity and stress due to COVID-19 lockdown, school students had more of junk & high calorie recipes often that

led to more than 20% weight gain during last 3 months that brought them in the category of obesity. It is an alarming signal for health economics of the country that should be taken care of in due time otherwise serious consequences can be seen in future. Therefore, there is a strong need to counsel students about healthy food choices & motivate them for physical activity to keep them nutritionally fit.

References

1. Bacopoulou, F., Bacopoulou, V., Landis, G., Rentoumis, A. & Chrousos, G. (2015). Waist circumference, waist-to-hip ratio and waist-to-height ratio reference percentiles for abdominal obesity among Greek adolescents. *BMC Pediatr.* **15**: 50. doi: [10.1186/s12887-015-0366-z](https://doi.org/10.1186/s12887-015-0366-z).
2. Brooks, S.K., Webster, R.K., Smith, L., Woodland, L., Wessely, S., Greenberg, N. & Rubin, G.J. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *Lancet - Int. J. Environ. Res. Public Health*, **17**, 2381.
3. Chan, J.F., Yuan, S., Kok, K.H., To, K.K., Chu, H., Yang, J., Xing, F., Liu, J., Yip, C.C. & Poon, R.W. (2020). A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: A study of a family cluster. *Lancet*.
4. Chen, Y., Liu, Q. & Guo, D. (2020). Genome structure, replication, and pathogenesis Coronaviruses. *J. Med. Virol.* **92** (4), 418–423.
5. Huang, C., Wang, Y., Li, X., Ren, L., Zhao, J., Hu, Y., Zhang, L., Fan, G., Xu, J. & Gu X. (2020). Clinical features of patients infected with 2019 novel corona virus in wuhan china. *Lancet*, **395** (10223), 497 – 506.
6. Hui, D.S.I., Azhar, E., Madani, T.A., Ntoumi, F., Kock, R. & Dar, O. (2020). The continuing 2019-nCoV epidemic threat of novel coronaviruses to global health: The latest 2019 novel coronavirus outbreak in Wuhan, China. *Int. J. Infect. Dis.* 264–66.
7. Inter-Agency Standing Committee (IASC) (2007). IASC guidelines on mental health and psychosocial support in emergency settings. Geneva.
8. Kang, L., Li, Y., Hu, S., Chen, M., Yang, C. & Yang, B.X. (2020). The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. *Lancet Psychiatry* **7**: e14.
9. Khalidkar, A., Ekbote, V. & Agrawal, S. (2014). Waist circumference percentiles in 2- 18 years old Indian children. *The J of Pediatrics* DOI:[10.1016/j.jpeds.2014.02.018](https://doi.org/10.1016/j.jpeds.2014.02.018).
10. Killerby, M., Biggs, H., Midgley, C., Gerber, S. & Watson, J. (2020). Middle East respiratory syndrome coronavirus transmission. *Emerg. Infect. Dis.* **26** (4), 191–198.
11. Kowsalya, T. & Parimalavalli, R. (2014). Prevalence of overweight /obesity among adolescent girls in Salem District, India. *Indian journal of health sciences & biomedical research KLEU*, **7**(2), 73 – 77.
12. Lalitha, R., Surekha, B Shetty & Anil Kumar, R. (2016). The waistline of Indian men is expanding faster than women with general obesity and abdominal obesity reaching a epidemic in Indian subject with diabetes. *Int. J. Med. Res. Rev.* **4**(10), 1853 – 1858.
13. Misra, A., Vikram, N., Gupta, R. & Pandey RM (2006). Waist circumference cutoff points and action levels for Asian Indians for identification of abdominal obesity. *Int. J. of Obesity* **30**(1) 106- 111.
14. Recommended dietary allowances & estimated average requirements. Nutrient requirements for Indians 2020. A report of the expert group Indian Counsel of medical Research, National Institute of Nutrition. Hyderabad, India

15. Romaguera, *et al.* A multi center study (2010). Mediterranean dietary patterns and prospective weight change in participants of the EPIC- PANACEA project. *Am. J of Clin. Nutr.* **92(4)** 912-21. doi: 10.3945/ajcn.2010.29482
16. Snehlata, C., Vishwanathan, V. & Ramchandran, A. (2003). Cutoff Values for Normal Anthropometric Variables in Asian Indian Adults. *Diabetes Care*, **26(5)**, 1380-1384. <https://doi.org/10.2337/diacare.26.5.1380>.
17. Tol, W.A., Barbui, C., Galappatti, A., Silove, D., Betancourt, T.S. & Souza, R. (2011). Mental health and psychosocial support in humanitarian settings: linking practice and research. *Lancet* **378**,1581-91.
18. Vijayanchali, S.S. (2014). Prevalence of obesity in the rural adult population: an empirical assessment. *Journal of Research, Extension and Development*, **2 (6)**, ISSN: 23191899.
19. Wang, C., Michael, T., Ashley, E.R., Fardeen, M.A., Wandee, S., Habib, H.A., Tran, B.X., Hussain, S., Hoang, M.T., Le, X.T., Ma, W., Pham, H.Q. & Shirazi, M. (2021). The impact of COVID-19 pandemic on physical and mental health of Asians: A study of seven middle income countries in Asia. *PLOS ONE*, February <https://doi.org/10.1371/journal.pone.0246824>.
20. Willman, M., Kobasa, D. & Kindrachuk, J. (2019). A comparative analysis of factors influencing two outbreaks of middle eastern respiratory syndrome (MERS) in Saudi Arabia and South Korea. *Viruses* **11(12)**, E1119.