Questionnaire Based Study: Changes in Dietary Habits and Sleep Pattern Before and During Covid-19 Lockdown Period (Indian Scenario)

R V Sista* and V Railla

Department of Foods and Nutrition, Sun Degree College, Hyderabad – 500020, Telangana, India

Abstract
Data regarding the association between dietary habits and sleep pattern during a pandemic scenario was limited. In this study, we hypothesised that the sleep pattern has taken a negative curve over the dietary habits which resulted in excessive food intake. This study was based on the data collected from the people residing in India during June 2020. Overall 456 responses (from the individuals aged 25 years and above) were recorded. Food habits were estimated by using semi-quantitative food frequency questionnaire. There was a significant difference between pre-lockdown and lockdown period which affected the dietary habits and sleep pattern of an individual.

*Correspondence
Author: R V Sista
Email: vsista625@gmail.com

Introduction

The current corona virus (COVID - 19) situation has affected the people of many countries. The worldwide pandemic has affected almost every aspect of our life with the sudden shut down of cities and countries. Most of the population had started working, studying and learning from home via online platforms. This had brought a drastic change in the daily routine of the population worldwide. All of these changes affected people not only physically, but also psychologically, which led to change in the consumption of food, reduction in the physical activity and later sleep timings. The main aim of our study was to explore the linkage between COVID – 19 lockdown periods and the change in the dietary habits and sleep pattern of the people residing in the region of India [1].

Although several studies have investigated dietary habits and sleep patterns, research regarding the factors affecting these habits during the period of a pandemic, wherein people are forced to lead a life under lockdown remains lacking in Indian population. This population based observational study was performed on data obtained through a self-complete questionnaire from the people residing in India.

The main aim of the study was:

1. To obtain a baseline data on the dietary habits and sleep schedule of the individuals
2. To obtain information on the factors affecting the changes in the dietary habits and sleep schedule
3. To note the cross associations of the changes in dietary intake and sleep pattern of individuals during a pandemic scenario.

Experimental

A Research questionnaire was designed in English language by using Google forms. This form was circulated to the population aged above 25 years by using social media platforms like WhatsApp, Facebook, etc. A total of 456 respondents completed the said questionnaire.

Socio-demographic and lifestyle behavioral data such as age, residential area, occupation, size of the family and annual income were obtained from the research questionnaire circulated. Residential area was reclassified as the name of the state (Telangana, Andhra Pradesh, Maharashtra, Gujarat, etc). Annual income was reclassified as lower middle class, higher middle class and high class income respectively.

Dietary Habits

Data regarding the food habits, skipping of breakfast/lunch/dinner, the time at which the food is consumed, the type of food consumed and the food preferences were obtained from the questionnaires circulated. The food preferences were reclassified into vegetarian and non-vegetarian. Skipping of meals was categorized into once, twice, thrice and more than thrice per week. All these variables and data from the questionnaire were analyzed to determine the changes in lifestyle during the lockdown compared to before the lockdown.

Sleep pattern and physical activity

Activities of the individuals before and during the lockdown were collected. Physical activity was reclassified as yoga/meditation, Pilates, gym workout, others. The time at which physical activity is performed was classified into morning and evening. The time spent in performing the physical activity was classified as <30 minutes/day, 30-60 minutes/day, >60minutes/day. Sleep schedule was analyzed depending on the time at which the person wakes up and the nap time during the day (if any) and the time at which the person goes to bed. Post lunch activities were recorded which were categorized as relax (watch TV/listen to music), nap and occupational work. All the other variables were assessed using yes or no responses in order to evaluate the factors affecting the changes in the dietary habits and sleep pattern [2].

Evidence from previous research studies have concluded that the food consumption has increased with short term sleep restriction. Epidemiological studies have shown that late sleep or insufficient sleep with the presence of an obesogenic environment of readily accessible food has increased the ingestion of calories. It has also stated that sleep restriction could be one of the environmental factors which might contribute to the obesity epidemic [3 & 4].

Researchers have proved that 5 days of insufficient sleep not only increased the energy needs but also increased the food intake specifically, excessive consumption of calories which led to weight gain [5].

Results and discussion
Socio-demographic characteristics of respondents

A total of 456 participants both men and women took part in the survey who were aged between 25 years and above, the majority of participants belong to the age group of 25 to 35 year old. The respondents belonged to various States of India including Telangana, Andhra Pradesh, Gujarat, Maharashtra, Haryana, etc. Maximum contributors were working professionals from the field of IT, Banking sectors, Architects, etc and few contributors were retired employees. The average income of the respondents was taken, where 338 participants had an average income of above 2.5 lakhs per annum. Among all the participants only 119 participants earned an average income of 1 to 2 lakhs rupees per annum. Out of 456 partakers 57.5% had a family size of 2 to 4 members, 31.1% had a family size of more than 4 members and 12.7% of participants had a family size of 1 to 2 members.

Trends in sleeping patterns

Urbanization has led to change in daily routine of life which has a lot of effect on sleep time and wake up time of individuals. Advances in technology, increase in working hours and travelling long distances to reach the workplace are some of the responsible factors which resulted in altering the quality of sleep and decrease in sleep time [6]. In this study, the comparison of sleep pattern was noticed before and during covid-19 lockdown period in India. The survey analysis (**Figure 1**) revealed that there was markable change in the wake up time and sleep time during the lockdown when compared to before the lockdown. 32.4% people used to wake up before 6 am but after the lockdown began 49.8 % people woke up in between 7 to 8 am. The reasons for the shift in wake up time were identified as -

1. No need to rush for office or work.
2. Convenience of working from home
3. Online learning methods

It was also observed that 25.4 % participants woke up after 10 am during the lockdown period while no participant woke up after 9 am before lockdown.

Sleep plays a key role in maintaining proper upright metabolic functions in the body. Studies have shown that there is an interrelation between sleep and effect on metabolic activities. The study revealed that 60.3 % people used to sleep in between 10 to 11 pm before lockdown while the statistics decreased to 50.2% during lockdown.

Before lockdown only 13.6 % participants used to sleep after 12 am while during lockdown there was a marked shift to 24.3 % participants.

Thus, it can be concluded that the decline of sleep quality might have been experienced which may have an impact on metabolic functions of the body. One of the possible reasons for late night sleep may be stated as work from home facilities.
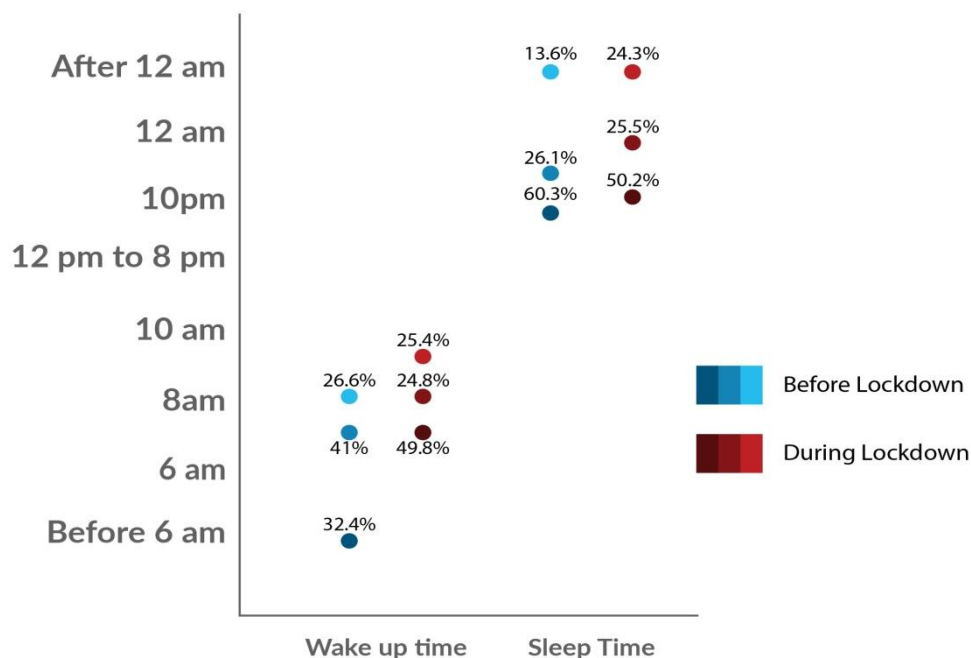
Figure 1 Changes in the Sleep pattern with effect to Lockdown

Physical activity and health

Being physically active keeps an individual mentally fit and free from anxiety, stress and depression. Individuals involved in physical activities are much stronger and healthy as compared to the individuals who are not physically active [7]. In this study, out of 456 individuals, 58.6% people were occupied in various activities such as yoga/meditation, walking, playing tennis, cycling, swimming, etc., on regular basis. 30.9% people were not involved in any kind of physical activity, while 10.5% partakers started indulging in some sort of physical activities like walking, Yoga and meditation, playing badminton with their family members during lockdown.

The analysis of the conducted survey revealed that duration of exercise in between 30 to 60 minutes was preferred by 59% people, whereas 25.4% people preferred less than 30 minutes of physical activity. 15.6% individuals were indulged in the physical activity for more than 60 minutes per day.

43.5% respondents preferred doing physical exercise in the morning hours of the day 20.3% preferred in the evening hours and 24.8% preferred performing yoga or any form of physical activity twice a day i.e. both morning and evening.

Dietary habits

Dietary habits play a key role in maintaining healthy lifestyle, which helps an individual to maintain healthy weight and also helps in preventing or reducing the risk of chronic degenerative diseases.

Good nutrition of the day which includes breakfast, lunch, evening snacks, and dinner or a minimum of three major meals of the day that is breakfast lunch and dinner along with at least 30 minutes of physical exercise provides overall wellbeing to the mankind.

In the present study the pattern of consumption of breakfast, lunch and dinner were observed before and during lockdown (**Figure 2**).

It is always said that "Eat breakfast like a king", meaning breakfast which is often the first meal of the day taken after 8 hours of fasting from the last consumed meal, which shall provide a minimum of one third of total nutrients of the day. Breakfast is necessary to be consumed by the individuals of all age groups in order to maintain proper metabolism. Studies have stated that skipping of breakfast leads to poor cognitive functions as well as decreased supply of vital nutrients like vitamins and minerals [10].

By analyzing the results of the survey conducted, it was found that the lockdown period has not affected the habit of consuming breakfast of 76.1% respondents. However 10.7% respondents have a habit of skipping breakfast regularly with no effect of lockdown, whereas 3.5% respondents have started consuming breakfast only during the period of lockdown. On the contrary, 9.7% individuals used to consume breakfast only before lockdown.
The most preferred breakfast choice of 76.1% respondents was Indian preparations such as idly, poha, thepla, etc. followed by ready to eat breakfast cereals, eggs and left over foods.
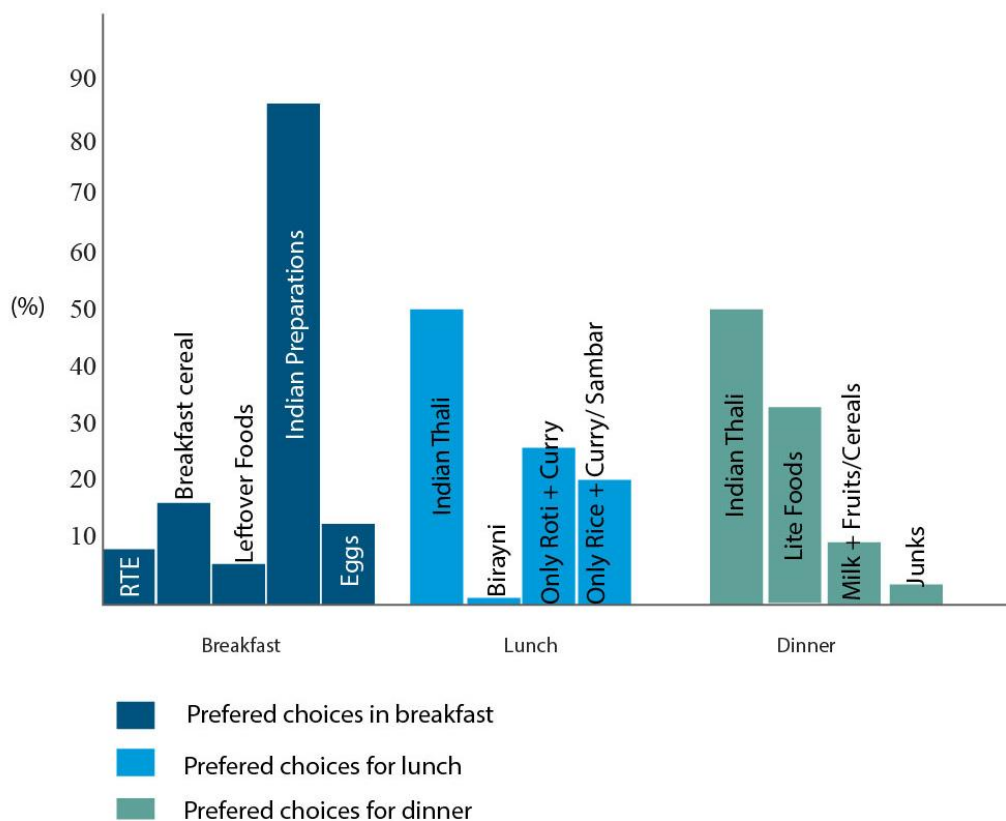
Figure 2 Preferred Choices for Breakfast, Lunch and Dinner.

According to ICMR NIN, it is recommended to consume a minimum of 500 ml of milk per day and at least one medium sized fruit per day which helps in meeting the body's requirement of minerals, vitamins and roughage [8].

In order to understand the dietary habits a question related to the consumption of milk/fruits was added in the questionnaire where it was observed that 66.2% partakers had the habit of consuming fruits/milk every day. On the contrary 9.2% individuals consumed neither fruits nor milk, whereas 24.6% individuals consumed fruits/milk on a regular basis depending on its availability. There was not much of a change in the pattern of consumption of fruits/milk during and before lockdown.

It has been concluded that 46.6% individuals preferred consuming fruits/milk in the morning time (8am - 12 noon), 35.9% preferred to consume in the evening (4 pm to 8 pm), 12.1% preferred to consume at post-lunch(12 noon to 4pm) and only 6.3% preferred to consume it after 8 pm.

The menu of healthy lunch and dinner should comprise of adequate portions of calories, fat and protein along with vitamins and minerals which states that all the basic food groups should be included in the plate served.

The analysis of the study revealed that 54.6%, 23.9%, 19.7% participants preferred to consume lunch in between 1 to 2 pm, 2 to 3 pm and12 to 1 pm respectively.

The most accepted lunch choice was Indian thali which included rice/roti, veg or non-vegetarian curry along with curds or buttermilk. However it was found that, 76.1% of population preferred to consume vegetarian food, whereas 23.9 % population preferred to consume both vegetarian and non-vegetarian foods.

Out of 456 respondents only 211 respondents had dal compulsorily in their daily diet. Pickles/Papads/Fryums were occasionally a part of the meal. However some respondents preferred to have heavy foods or appetizing foods in the form of feast such as biryani, sambar rice, fried foods and exotic dishes at least once in a week

The study revealed that 16% of respondents have skipped their lunch/dinner intentionally once in a week because of religious fasting practices and expanded portion size in the previous meal. Whereas, 19.5% respondents have skipped their meal unintentionally due to excessive work load and non-flexible working hours.

It was also noticed that there was not much of a change in the pattern of dinner before and during the lockdown. On an average, 277 participants preferred to consume lite foods such as Upma, steamed foods, porridge, milk and fruits as part of the dinner. Only a small group of participants (20%) preferred to have junk foods such as pizza, sandwich, samosa, burger, fries, etc., for dinner occasionally.

In the current study it was observed that the consumption of junk food was quite minimal during lockdown because of the unavailability of restaurant foods and Street foods.

Conclusion

All the participants demonstrated a clear understanding of the questionnaire. There were no aspects in the questionnaire that was difficult to understand. The outcome of the questionnaire lead to the conclusion that lockdown period has affected the sleeping pattern and dietary habits of the citizens. Sleeping late at night and waking up late due to the relaxed daily routine as there is no need to rush to workplaces. Since all of them were working and learning from home there was a remarkable change in sleep pattern and dietary habits which included delayed consumption of breakfast or skipping of breakfast. It was also found that whenever a meal was skipped the following meal was excessively consumed and if there was a delay in meal consumption the following meal was consumed at an inappropriate time which in turn affected the sleep pattern of an individual. Family members living together and the unavailability of the restaurant food or street food has led to feasting once or twice in a week followed by post lunch naps/relaxing or performing occupational work which in turn lead to increase in the number of hours spent sitting at a single place with little or no physical activity. The results of the study stated that even though people started to indulge in some kind of physical activity like Yoga/meditation during the lockdown period, there was a markable change in their dietary pattern because of the decrease in the number of hours of sleep time. It can be concluded that sleeping habits has to be taken seriously as a distinct construct, which in turn can affect the dietary pattern.

Study limitations

This validation study had a short time frame. The original proposed sample was 500 responses. Because of the time constraint, the sample size fell below the anticipated numbers. Nevertheless, the achieved sample size yielded significant findings.

References

[1]   Stankovska G, Memedi I, Dimitrovski D. Coronavirus COVID-19 disease, mental health and psychosocial support. Society Register, 2020, 4(2):33-48.
[2]   Seo Y, Je Y. A comparative study of dietary habits and nutritional intakes among Korean adults according to current depression status. Asia-Pacific Psychiatry, 2018,10(3):e12321.
[3]   Bosy-Westphal A, Hinrichs S, Jauch-Chara K, Hitze B, Later W, Wilms B, Settler U, Peters A, Kiosz D, Müller MJ. Influence of partial sleep deprivation on energy balance and insulin sensitivity in healthy women. Obesity facts, 2008;1(5):266-73.
[4]   Brondel L, Romer MA, Nougues PM, Touyarou P, Davenne D. Acute partial sleep deprivation increases food intake in healthy men. The American journal of clinical nutrition, 2010, 91(6):1550-9.
[5]   Markwald RR, Melanson EL, Smith MR, Higgins J, Perreault L, Eckel RH, Wright KP. Impact of insufficient sleep on total daily energy expenditure, food intake, and weight gain. Proceedings of the National Academy of Sciences, 2013, 110(14):5695-700.
[6]   Pot GK. Sleep and dietary habits in the urban environment: the role of chrono-nutrition. Proceedings of the Nutrition Society, 2018, 77(3):189-98.
[7]   Paluska SA, Schwenk TL. Physical activity and mental health. Sports medicine, 2000, 29(3):167-80.
[8]   Gillham B. Developing a questionnaire. A&C Black, 2008, Pg.15-28
[9]   Lee SH. Constructing effective questionnaires. Handbook of human performance technology, Hoboken, NJ: Pfeiffer Wiley, 2006:760-79.
[10] Srilakshmi B. Dietetics. New Age International; 2007, Pg. 6-7.