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Impact of Covid-19 Lockdown and Online Studies on Fitness in College Students in and Around Kerala

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Abstract. Coronavirus disease (COVID-19) is a newly discovered infectious disease caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). In March 2020, WHO declared the COVID-19 outbreak a pandemic. As a result, schools and colleges were forced to shut down all over the world. This makes all students population to study from home through online classes. The objective of the study was to find out the relationship between COVID-19, fitness, and lifestyle changes in students. A sample of 300 students (aged between 18 and 25 years) from Kerala, Tamil Nadu, and Karnataka participated in this online survey sent through a Google Form. The survey consisted of 15 questions regarding the student's activity level, food habits, and health. 90% of the population did not have any medical limitations to stay active during this survey. Out of this, more than half (53%) of the study population has marked that the pandemic has influenced their fitness status. The sedentary behaviour among the population has increased. 49.7% of the population was physically less active, and 37.7% was not at all active. The possible reasons could be lack of time to do exercise, altered sleeping behaviour, increased laziness, and increased online time. 60.7% population have marked that they do not eat more during pandemic and their food habits were good. 47.7% wish to improve their overall health but not decrease weight. Only 16.7% of the population needs to reduce their weight. This is associated with better access to fresh, homemade food. This indicates that majority of studied student population has good eating habits, but they are not able to stay physically fit due to inability to stay physically active. This study concludes that physical activity limitation is the major factor found to have decreased during the COVID-19 pandemic's online learning. Majority of students' eating habits have improved due to lockdown, but their fitness status has remained low due to online learning.

Keywords: Sarscoronavirus, onlineclasses, collegestudents, physicalinactivity, physical fitness, sedentary lifestyle, food habits.

INTRODUCTION

The SARS Coronavirus that emerged in 2019 originated in Wuhan, China. COVID-19 is an airborne infection that spreads worldwide due to contact between people [1]. Amid the widespread of COVID-19, people all over the globe have been prompted to remain at home and to keep distance from contact with people outside the home. Lockdown restrains people from places like schools, colleges, gyms, parks, and other settings where they can be active [4]. Staying indoors likely results in a significant diminish in moderate-to-vigorous physical activity and an increase in inactive. Even though quarantine and lockdown are useful measures for reducing physical contact and controlling infection, they affect people's health and lifestyles [5]. Apart from these, online studies lack mobility between home and school. E-learning is a very effective and efficient way of learning in a pandemic situation, but it has lots of disadvantages for the students. Students are at risk of mental health issues. The frequency of depression and anxiety was 29% and 21%, respectively, among medical students, according to a study by Imran Aslan. Majority of students show increased perceived stress and anxiety due to pandemics [6]. Mental health

and physical activity have been highly recommended amidst COVID-19 by WHO. WHO recommends 150 min of moderate-intensity aerobic physical activity per week with strengthening exercise for two more days per week, but it is questionable whether this is possible at home due to students' online learning. So, the college population is set to be at risk for a higher level of sedentary behaviour and physical inactivity [8]. So, this study is aimed to know whether online learning influences activity levels in college students in and around Kerala.

STUDY DESIGN AND SAMPLE

This is a single-blind study. A cross-sectional online questionnaire survey was conducted among college students. E form was sent to students of different colleges in Kerala, Karnataka, and Tamil Nadu. Since all these states were on online classes, students were invited to participate through WhatsApp. Students attending online classes were invited to fill the questionnaire form from 16 May 2021 to 23 May 2021, when all the colleges were on online classes. The online form inclusion criteria were: (1) college students attending online classes, and (2) aged between 18 and 25 years. Exclusion criteria included students having physical limitations to be active such as COVID-19, musculoskeletal diseases, congenital disorders, and neurological disorders. A completed form was considered consent by the participant.

DATA COLLECTION

The questionnaire has four parts consisting of baseline data, food habits, activity levels, and a question to mark their perception of their own fitness. The questionnaire consists of 15 closed-ending questions; the first four questions were regarding basic information on age, college they belong to, and body type, collected at the beginning of the form. Questions regarding physical activity were asked as follows: (1) what is your current fitness level (perfect, good, average, poor, and unfit); (2) mark your level of laziness during lockdown (very low, low-moderate, moderate–high, and very high); (3) do you feel exhausted after a mild to moderate work (yes, no, and sometimes); (4) how long do you exercise at home (0–1, 1–2, 2–3, 4 h, and not at all); and (5) what would be your primary fitness goal among the following (weight reduction, improve mood and stress level, improve overall health, reshape or tone the body, and enjoyment). Questions regarding the food habits were as follows: (1) do you think you eat healthy diet (yes or no or occasionally); (2) do you think you eat more than you need during lockdown (yes or no); (3) do you consume snacks or junk foods in between meals (yes or no); and (4) how many glasses of water you drink per day (2–5, 5–7, 7–9, and more than 9). A final question was added to understand their perception of whether their fitness has been influenced by COVID-19 or not.

RESULT

After receiving responses from 300 students, 58 responses were incomplete, and 22 students were excluded from the study due to physical limitations (16 COVID-19 infections and 6 congenital disorders). A total of 218 completed data were considered for analysis. Participants included 218 students with mean age of $20.98 + 1.96$ years. Out of which, 73.9% were males and 26.1% were female students. The data are given in Table 1.

HEALTHY DIET AND OVEREATING

Figure 1 shows that 34.9% of participants have a healthy diet at home, and majority of participants are on occasional healthy diet (50.5%). A 67% of respondents are not overeaters, but 46.3% of students consume snacks or junk food between meals. In addition, there is no statistically significant difference between male and female students in junk food consumption, overeating, or a healthy diet. A chi-square test is done between male and female students on water consumption and shows that there is a statistically significant difference among female and male students on water consumption ($p < 0.00$). Female population is found drinking more water compared to male student population.

FITNESS LEVEL AND PHYSICAL ACTIVITY

The participants who engaged in physical activity are depicted in Figure 2. It shows that majority of population is active only less than an hour per day. Students who are not at all active are 36.7%. This is also related to tiredness and laziness. 50.5% of students feel tired occasionally during activities that are related to laziness. 17.9% of the population has marked YES on tiredness on activities. 12.8% of the population is active only for 1–2 h. Only minor (0.5%) students are physically active for more than 2 h, but their perception of their fitness level is not comparable. That is, majority of the students have marked their current fitness as average (57.8%) or good (30.3%). Factors associated with a lack of physical activity are laziness, changes in sleeping behaviour, and tiredness.

PERCEPTION OF IMPACT OF COVID-19 ON FITNESS

Figure 3 gives the data on fitness goals and shows that 47.2% of the population wanted to improve their overall health during the pandemic. Except for 5.5% of students, all others have specific requirements, such as to reduce weight (17.9%), improve moods and stress levels (10.6%), and reshape or tone the body (18.8%). 51.45% of the student population reported that their fitness was affected by the COVID-19 infection. A significant difference in fitness goal among male and female students is found ($p = 0.045$).

Table 1.

Demographic Variables	Frequency	%	Demographic Variables	Frequency	%
Gender			**Snacks/junk food**		
Male	57	26.1	Yes	117	53.7
Female	161	73.9	No	101	46.3
Body type			**Healthy diet**		
Lean	54	24.8	Yes	76	34.9
Moderate	154	70.6	No	32	14.7
Overweight	10	4.6	Occasionally	110	50.5
Water intake/day			**Laziness level**		
2–5 glasses	85	39	Very low	17	7.8
5–7 glasses	71	32.6	Low-moderate	123	56.4
7–9 glasses	40	18.3	Moderate-high	61	28
More than 9	22	10.1	Very high	17	7.8
Medical limitation			**Fitness level**		
COVID-19 infection	16	6.6	Perfect	4	1.8
Neurological disorder	0	0	Good	66	30.3
Congenital	6	2.4	Average	126	57.8
Musculoskeletal disorder	0	0	Poor	17	7.8
None of the above	0	0	Unfit	5	2.3
Physical activity duration			**Fitness goal**		
0–1 h	109	50	Weight reduction	39	17.9
1–2 h	28	12.8	Improve moods and stress level	23	10.6
2–3 h	1	0.5	Improve overall heath	103	47.2
Not at all	80	36.7	Reshape or tone the body	41	18.8
Overeating			Enjoyment	12	5.5
Yes	72	33	**Sleeping behaviour**		
No	146	67	Increased/decreased sleeping time	73	33.5
Tiredness			Day time/late night sleepiness	62	28.5
Yes	39	17.9	Interrupted sleepiness	14	6.4
No	69	31.7	No changes	69	31.7
Sometimes	110	50.5			
Impact of COVID-19 on fitness					
Yes	112	51.4			
No	106	48.6			

Figure 1. Frequency distribution on overeating and junk food consumption.

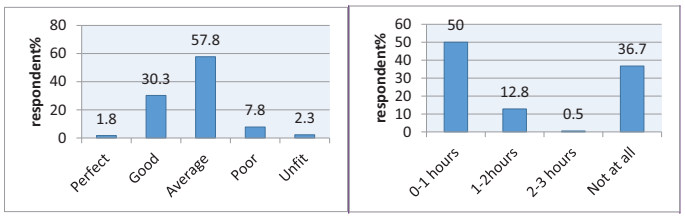

Figure 2. Frequency distribution on current fitness level and water consumption per day.

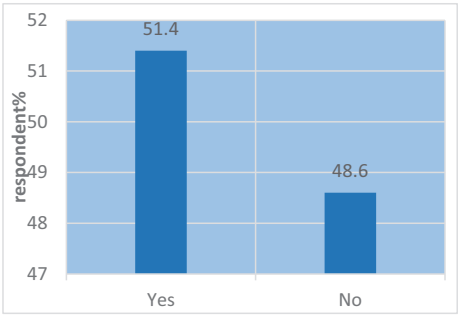

Figure 3. Frequency distribution on impact of the COVID-19 on fitness.

DISCUSSION

Studies have been done on COVID-19 and fitness among college students, but none of the studies were held in Kerala; so, this study is aimed to know the fitness level

and food habits among students from Kerala, Karnataka, and Tamil Nadu. Majority of students were at home during the pandemic, but few of them were at hostels during pandemics. Both the categories lack mobility, direct interaction between people, and are prone to sedentary behaviour. Physical activity, food habits, and fitness among students have been observed through the study. Assessing lifestyle among this population is to make them aware of the need to maintain or improve their fitness level and to promote healthy behaviour during the COVID-19 pandemic.

Majority of the population has denoted that their food habit at home varies between occasional healthy eaters and healthy eaters; an occasional healthy diet can also be considered to be good because their access to junk food is limited at home compared to when they were going college. Similarly, fresh food availability has improved due to lockdown. Majority of the population is occasional healthy food eaters that could be due to a sudden shift to healthy food consumption, which is not acceptable to majority of students because they are adapted to regular consumption of street food. Since the availability of bakery products was not interrupted, they must have had bakery food. That could be the reason for reporting on occasional healthy eating. Both are indicating that healthy food consumption has improved. These data are consistent with Ruzica Dragun et al. (2020). Their study on medical students' life habits showed that a positive change in food habits was found in 20–38% of students, similar to the present study. A 34.9% of students are on good food habit. Students who are staying far from home also had to cook their own, but their access to fresh food is difficult. So, this kind of student subgroup needs to be assessed further.

In total, 80 students reported their activity level as not at all active in participating in exercise. Maximum number of students performed physical activity for a duration of 0–1 h per day. This finding is consistent with the findings of Francesco Luciano et al. (2020) in medical students. A significant decrease in MET before and during the pandemic was observed. These data are associated with changes in sleeping behaviours, changes in laziness, and tiredness. Our study result on physical activity is inconsistent with that by Ruzica Dragun et al.; they reported a healthy lifestyle in adolescents and medical students in Croatia. This is because majority of their students followed a Mediterranean diet.

A statistically significant association between COVID-19 and sleeping behaviour was found. Those who reported YES on effect of the COVID-19 on fitness (42%) have also reported increased or decreased sleeping time. Majority of those who answered NO reported no changes in sleeping behaviours. Similar result was found by Meenakshi Sinha et al. (2020), in which they found that a delay in sleep onset and sleep awake was reported by 18–25 age group. They say that this change in sleeping habits is due to home confinement, which forces the younger age group to sleep more.

An association between sleeping behaviour and laziness was found using statistical analysis. Majority of the students who marked on very low laziness level during the pandemic did not have any changes in sleeping pattern; among students who marked on low-moderate laziness, no changes in sleeping pattern was found. 32.8% of the population had a moderate-high laziness level, and their sleeping was altered. Similarly, high laziness during the pandemic was associated with altered sleeping pattern. These data are in contrast to a recent survey study done by Ravi Gupta et al. (2020), in which a deterioration in sleep habits was found. They found delayed bed time and pronged wake-up time. This deterioration in sleeping habits was found to be associated with depressive symptoms after lockdown. The lack of physical activity found in the present study reveals that these altered sleeping habits can be one of the reasons for it, but their study population was an older age group.

A statistically significant association between body type and overeating was found. Those who are marked on overeating is also reported on current fitness level as overweight; this was seen in both male and female students. Statistical analysis of fitness goal and gender reveals that a relationship exists between fitness goal and gender. Majority of females reported their fitness goal as to improve their overall health. A similar relationship was found in male students, that is, to improve overall health during the pandemic. The present study found another important finding of a statistically significant association between gender and water consumption. It was found that female population is drinking 2–5 glasses of water per day, at the same time, male population is found drinking more water than females (5–7 glasses). This needs to be addressed among student population.

Frequency distribution on students' perceptions of COVID-19 and fitness shows that 51.4% of students believe that their fitness has been affected by COVID-19, and 48.6% of students marked that fitness has not been affected by COVID-19.

These data show that the food habits in student population have improved in many cases, but they still need to improve in many more. More attention should to be given to the food habits among students because their access to fresh food is improved during lockdown period. Since it is proven that sleeping behaviour and laziness are related to food habits, an improvement in food habits will eventually promote a good sleeping pattern. It is also proven that the physical activity duration per day is low. Comparing the usual college times, the mobility is reduced because students are on continues online classes, have less time for being physically active, and are more active online. This can be the primary reason for reporting a decreased activity level.

LIMITATIONS OF THE STUDY

The methodological limitation of the study is that the inclusion and exclusion criteria are dependent upon students' responses. Some students would not be aware of their exact body type. For example, students who marked moderate might be overweight. Similarly, the exact fitness status is not possible to assess. Their reports are based on their perceptions. Self-reported data are less reliable. The questionnaire is created subjectively, which carries limitations. Next, a response bias could have occurred. The socioeconomic status is not able to gain. So, their access to food during COVID-19 is thinkable. Again, this study does not ask for pre-lockdown data. So, the current data cannot provide insight into the changes that occurred, but rather give evidence for the current state of lifestyle.

CONCLUSION

Online learning has influenced students' lifestyles in different ways. Even though their access to fresh food was enhanced, their fitness level remains unimproved. Lack of time to be physically active is associated with increased laziness and tiredness among students. In addition, water intake is lower in female students. Awareness among students should be prompted regarding the importance of physical activities.

CONFLICTS OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

AUTHORS' CONTRIBUTIONS

All authors contributed to the idea of study. Corresponding author contributed to the sample preparation and major contribution to the design and methodology and final preparation of the manuscript. Second authors helped in correction of questionnaire to help in writing manuscript. Third authors assisted with questionnaire preparation and result analysis.

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