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Original Research Article

The impact of COVID-19 pandemic on diet and lifestyle of undergraduate medical students of South India-a cross sectional study

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ABSTRACT

Background: COVID-19, infectious disease caused by the Corona virus, caused economic and social disruptions all over the World. In order to contain this pandemic, complete/partial lock down was declared in different parts and thus restricting all human activities. Lifestyle behaviours, especially eating habits, physical activity and sleep patterns changed causing complications such as obesity, diabetes and cardiovascular disorders. The prevalence of depression, anxiety and stress increased among the public.
Methods: The study is conducted among medical students to find out the extent of after effects of COVID pandemic on the diet and life style of medical students. Online questionnaire was used to access the lifestyle and exercise patterns of medical students across South India.
Results: The study reveals that the pandemic has led to notable shifts in the daily routines, eating habits, and overall well-being of this demographic. Factors such as increased stress, remote learning, and limited social interactions have played a crucial role in these changes. Significant change in hours of sleep, and change in sitting and screen time has been observed. Slight increase in the daily intake of fruits and vegetables, intake of balanced diet and immunity-boosting food, consumption of junk food/fast food and fried food has been observed. The consumption of unhealthy food when bored or stressed is also slightly increased. There is also slight change in quality of sleep and participation in exercise.
Conclusions: The publication provides insights into the challenges faced by medical students and highlights the importance of addressing these issues to support their health and well-being during these unprecedented times.

Keywords: COVID-19, Corona virus, Medical students, Survey, Physical exercise, Psychological impact

INTRODUCTION

Coronavirus disease (COVID-19) is a contagious disease caused by the SARS-Cov-2 virus. Older people and those with underlying medical conditions are more likely to develop serious illness. Anyone can get sick with COVID-19 and become seriously ill or die at any age. On March 11, 2020, the novel coronavirus (COVID-19) outbreak was declared as a global pandemic by the world health organisation (WHO).[1]

The highly contagious nature of COVID-19 and the increased mortality among the general population has forced to lockdown and quarantine their population in many countries including India to control the spread of the disease.[2] The second wave started by the middle of March 2021.During this period, the countries across the world entered lockdown with the closure of educational institutions, offices, establishments,etc.[3] For medical students, practical sessions and classroom learning were backed up with virtual curriculum.[4]

This global burden compelled to redefine diet and lifestyle habits.[2] Factors like public health recommendations and government measures taken to abate infection have indirectly impacted food availability, dietary quality, normal daily activities, access to recreational public settings, social activities, work and financial security added up over time to altogether change lifestyle behaviours, especially eating habits, physical activity and sleep patterns that are well known risk factors for metabolic complications such as obesity, diabetes and cardiovascular disorders.[5]

Amped up life stress seems to be related to unhealthy eating and stressed people tend to indulge in food high in energy, fats, and sugars. Research has already demonstrated poorer diet in children during COVID-19 lockdown, although other sources suggest that eating habits in adults have not changed or may even have improved for some. Potential links has been established between diets high in processed and sugary food and poor mental health.[6]

By and large, prevalence of depression, anxiety, and stress in medical students is more compared to the general population which is possibly due to the high-pressure environment where they study. The pandemic has increased the burden of stress in the lives of the general population especially to the healthcare workers and medical students.[2]

Therefore, this study is conducted through questionnaire survey to assess the changes in physical activities and lifestyle including Undergraduate students pursuing their MBBS degree course in medical colleges of the South India.

METHODS

Study place

For the study, 400 undergraduate students from various medical colleges of South India in the age group of 18-35 years were chosen for the survey. The study is purely based on the primary data that have been collected through questionnaire developed in consultation with expertise in this field. Secondary data are also used for the study. That has been collected from published journals, articles and books. The validated questionnaire used in the study of Kumari has been used in the present study during the period from October 2021 to May 2022.[15]

Sample size was calculated from the reference study by Archana which reported 50% increase in intake of healthy diet and 40% increase in stress and anxiety.[15] In this proportion, the required sample size is approximately 400 with 5% precision and 95% confidence interval.

The following formula is used to calculate sample size:

$N=(1.96)^2p(1-p)/d^2$

Where,

N=Sample size, p=Proportion (is taken as 0.50), d=Precision (is taken as 0.05).

$N=(1.96)^2\times0.50(1-0.50)/(0.05)^2$

=384.16 (calculated sample size)

=400 (approx.)

The study design adopted was cross-sectional study. The period of the study is confined to six months from October 2021 to March 2022. The sampling method used is purposive sampling.

Exclusion criteria

Students doing their compulsory rotation ship in hospital were excluded from study.

Ethical clearance

Permission to conduct the study was obtained from the institutional ethics clearance committee. Informed written consent was taken from all participants of the study.

Study tool

The information was collected using a semi structured questionnaire which consisted of: Socio-demographic profile which looks into the basic identification details and questions to assess the socioeconomic classification of the individual, lifestyle related behaviour questionnaire and use of the five-point Likert scale as a response option.[15] Matsudo et al to classify level of the physical activity.[16]

Data collection

The data collected via online links comprising of the study tools and informed consent form. The data collected have been presented through proper tabulation, cross tabulation and diagrams. The data collated into a data sheet using Microsoft excel 2013 and analysed using statistical tools in SPSS 20.0. as percentages, mean and standard deviation. The various factors and their association with lockdown related changes, dietary and lifestyle factors studied using relevant test of significance such as Chi square test.

RESULT

Table 1 shows descriptive statistics of gender category. Out of the total 401 adult participants belonging to age group 18-24 years (mean age 21.49), 56.8% are female and 43.2% are male. Most of the participants had normal

BMI of 68.5%. Regarding socio economic status, 41.8% are of upper middle socioeconomic strata.

Table 1: Descriptive statistics of gender category.

Criteria	Group	Mean	SD
Eating behaviour	Female	52.26	11.43
	Male	50.55	12.35
Physical activity	Female	46.2	15.49
	Male	46.29	13.87
Sleep pattern	Female	40.46	15.64
	Male	40.03	15.83
Daily stress	Female	42.21	28.2
	Male	38.87	29.82
Addictive behaviour	Female	50.71	9.1
	Male	49.49	8.67

Tables 2 and 3 show descriptive statistics of each year of study and descriptive statistics of socioeconomic class. Female participants had increased daily stress levels compared to their male counterparts (42.21%). Percentage of students who felt little pleasure/interest in doing things during COVID-19 pandemic for several days is 41.4% and about 45.8% felt lonely for several days during pandemic. About half of participants (50.19%), had developed stress related addictive behaviour.

The proportion of students who reported increased consumption of balanced diet, fruits and vegetables were 48.6% and 54.8% respectively, 63% of the total study group also showed increased intake of immunity boosting foods. On the other hand 38.1% showed increased intake of junk food in times of stress.

Table 2: Descriptive statistics of each year of study.

Criteria	Group	Mean	SD
Eating behaviour	First year	46.72	9.76
	Fourth year	52.78	12.95
	Second year	51.34	12.2
	Third year	52.02	11.39
Physical activity	First year	45.35	12.37
	Fourth year	46.31	15.64
	Second year	47.67	12.62
	Third year	45.9	15.62
Sleep pattern	First year	36.63	16
	Fourth year	42.27	14.48
	Second year	42.1	14.63
	Third year	39.44	16.47
Daily stress	First year	31.98	25.19
	Fourth year	44.07	30.36
	Second year	38.97	26.76
	Third year	41.71	29.47
Addictive behaviour	First year	52.03	9.42
	Fourth year	49.87	10.28
	Second year	48.53	7.64
	Third year	50.52	8.45

Table 3: Descriptive statistics of socioeconomic class.

Criteria	Group	Mean	SD
Eating behaviour	Lower	34.82	13.89
	Lower middle	53.3	9.49
	Upper	50.96	13.15
	Upper lower	51.58	8.56
	Upper middle	51.17	10.89
Physical activity	Lower	37.5	5.89
	Lower middle	39.65	15.17
	Upper	46.53	15.17
	Upper lower	44.12	11.7
	Upper middle	47.47	14.95
Sleep pattern	Lower	18.75	26.52
	Lower middle	38.26	15.92
	Upper	39.18	16.5
	Upper lower	41.91	13.93
	Upper middle	41.67	14.26
Daily stress	Lower	12.5	17.68
	Lower middle	34.85	25.72
	Upper	40.06	29.05
	Upper lower	38.24	28.11
	Upper middle	42.86	29.36
Addictive behaviour	Lower	68.75	26.52
	Lower middle	51.14	4.8
	Upper	50.32	8.51
	Upper lower	50	0
	Upper middle	49.26	8.73

Tables 4 and 5 show descriptive statistics of BMI categories and analysis of each category under study respectively. Only 27.9% of the population were actively doing physical exercise, doing exercise for 5 times a week and/or about 30 minutes a day.

Table 4: Descriptive statistics of BMI categories.

Criteria	Group	Mean	SD
Eating behaviour	Underweight	52.45	12.22
	Normal range	51.19	11.89
	Overweight	51.68	11.84
	Obese	54.82	9.64
Physical activity	Underweight	47.55	13.77
	Normal range	46.03	15.09
	Overweight	46.03	14.06
	Obese	46.67	18.09
Sleep pattern	Underweight	42.16	11.17
	Normal range	39.59	16.06
	Overweight	41.35	17.39
	Obese	42.5	14.67
Daily stress	Underweight	41.18	27.76
	Normal range	40.55	29.08
	Overweight	42.69	29.88
	Obese	32.5	26.48
Addictive behaviour	Underweight	49.75	5.86
	Normal range	50.27	9.31
	Overweight	50.19	8.97
	Obese	50	11.79

Table 5: Analysis of each category under study.

Criteria	Mean	SD
Daily stress level	40.7	28.92
Eating behaviour	51.52	11.85
Daily stress level	40.77	28.92
Alcohol	48.94	12.89
Daily stress level	40.77	28.92
Smoking	51.43	9.66
Daily stress level	40.77	28.92
Sleep pattern	40.27	15.7

The Chi square test is used to determining whether the difference between the observed and expected values is statistically significant. The study revealed that there is no significant variation from the normal period except in the case of hours of sleep, and change in sitting and screen time. Slight change from normal period has been observed in the case of daily intake of fruits and vegetables, intake of balance diet and immunity-boosting food, consumption of junk food/fast food and fried food. The consumption of unhealthy food when bored or stressed is also slightly increased. There is also slight change in quality of sleep and participation in exercise.

Table 6: Demographic characteristics of participants.

Characteristics	Criteria	N	Percentage (%)
Age (in years)	18	3	0.7
	19	26	6.5
	20	51	12.7
	21	107	26.7
	22	134	33.4
	23	65	16.2
	24	14	3.5
	25	1	0.2
Year of study	First	44	11.0
	Second	68	17.0
	Third	192	47.9
	Fourth	97	24.2
Gender	Male	173	43.1
	Female	228	56.9

Inference

Female participants had increased daily stress levels due to restraints offered by COVID-19, and changing trends in curriculum which might have contributed to change in eating behaviour, increased consumption of immunity boosting foods in them and increased addictive behaviour in them as a coping mechanism.

Also from the survey, 1st year students had increased stress level, being exposed to medical fraternity for the first time, had increased daily stress level and which in turn contributed to addictive behaviour in them. Participants from low SES had increased daily stress and addictive behaviour, which implies that SES is a possible tool in the context of evolution of addictions amongst individuals.

Amongst the medical students, altered sleep patterns has been observed among the final year students. Positive association was also noted as the obese had altered sleep pattern.

DISCUSSION

Results of present study has been compared with the study done in split, Croatia where dietary habits, sleep and psychological well-being of adolescents and medical students during COVID-19 lockdown was studied. They surveyed 1326 students during 2018 and 2019, and compared their responses with 531 students enrolled in May 2020.[9]

As per their study, study found no considerable differences in dietary pattern between pre-lockdown and lockdown periods. Meal patterns remained reasonably steady. Average length of sleep duration increased by 1.5 hours. Regarding physical activity, results indicated that 41% of students surveyed in 2020 were active a few times a week, while additional 24% were active daily during lockdown.[9]

Assessment of dietary habits, physical activity and lifestyle, conducted in a public medical university in Iasi, Romania during the period April-May 2019 showed that, compared to the general population and the non-medical students, the medical student population is more likely to eat healthier, to have more knowledge about diet and nutrition, and to cautiously choose what goes into their body; moreover, they are more likely to give up unhealthy habits such as drinking alcohol or smoking cigarettes and are more occupied in physical activity. The results of this study confirmed that medical students have an understanding about how to nurture a healthy life and they practiced it, which is key for their future professional life.[13]

Our study showed increased consumption of fruits and healthy food items among the female participants. In contrary to the above-mentioned study, increased daily stress and addictive behaviour as coping mechanism was noted. This is in agreement with the study of the parent study wherein an increased or similar intake of main meals, snacks and balanced diet including wheat, pulses and legumes were reported in three-fourth of participants. Overall intake of fast food, junk food, fried food, sweats and chocolates found to be either similar or decreased. Intake of unhealthy foods out of boredom or stress was found to be a bit increased by around 20% of participants. Approximately 50% participants reported increased intake of immunity boosting foods during COVID period. Involvement of study participants in physical exercise was found to be increased. 40% of study population reported increased stress and anxiety.[15]

This is in conformity with the present study wherein 38.1% adopted eating junk food in order to combat stress imposed by the pandemic.

An online survey was conducted from April-May 2020 in general population (adults) of Spain. The short multidimensional inventory lifestyle evaluation-confinement (SMILE-C) was used. Positive screening for depression/anxiety, diet and sleep changes were all found to be linked with poorer lifestyles.[14] This is in agreement with the present study that students from lower socioeconomic strata had increased daily stress and addictive behaviour. Majority of the participants were irregularly active. The 81% had significantly disturbed and reduced sleep pattern. Similar to the above study, about 63% of the study population reported increased intake of immunity boosting foods.

Limitations

The study suffers from the following limitations: Due to time and resources constraints, the area selected for the study is confined to few medical colleges of South India. The information given by some students may not be accurate. However maximum care is taken to collect maximum information with accuracy.

CONCLUSION

COVID pandemic has made significant impact to the public life. The main impacts include stress, addictive behaviour and altered sleep patterns. The extent of impact to the medical students has been ascertained using questionnaire survey. The study revealed that female participants had increased daily stress levels due to restraints offered by COVID-19. Another important finding is the daily stress and addictive behaviour has increased for the students from low socially economical sector. Amongst the medical students, altered sleep patterns has been observed among the final year student's Positive association was also noted as the obese had altered sleep pattern. Significant change in hours of sleep, and change in sitting and screen time has been observed. Slight change from normal timeline has been observed in the case of daily intake of fruits and vegetables, intake of balanced diet and immunity-boosting food, consumption of junk food/fast food and fried food. The consumption of unhealthy food when bored or stressed is also slightly increased. There is also slight change in quality of sleep and participation in exercise. Standard procedures for the life style management for different sectors of people during such unprecedented period is to be developed for tackling the situation.

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