Original Article

Lifestyle Related Behavioral Changes Owing to the Global Pandemic among COVID-19 Positive Physicians Serving in a COVID Dedicated Tertiary Care Hospital

Rahman F[1], Sufrin S[2], Rashed A[3]

Abstract

Background: The COVID-19 pandemic continues to pose significant challenges and has had a global effect on people's lifestyle. The impact of measures taken to contain COVID-19 on lifestyle related behavior is undefined among physicians with COVID-19 positive serving in a corona dedicated health center.

Objective: The current study was undertaken to assess the impact of COVID-19 on life style related behaviors among physicians with COVID-19 including all human sciences related to lifestyle, dietary habits physical activity and behavioral studies.

Methods: The study is a descriptive type of cross-sectional web-based survey. The survey was conducted from March to May, 2021 among 61 COVID-19 infected physicians working at Mugda Medical College Hospital through a validated semi-structured questionnaire incorporated with GAD-7 scale using Google online survey platform. The sample was selected purposively and collected data were analyzed by SPSS-21 version. The P-value was two sided and values <0.05 were regarded as statistically significant.

Results: A total of 61 responses 70% were male and mean age was 35.33±12.5 SD. An improvement in healthy meal consumption pattern and a restriction of unhealthy food items were observed. 48.6% respondents had weight gained with an increase in daily screen time especially found among men. 3.5% of smokers decided to quit smoking. Physicians group aged 31-40 years resulted highly significant adherence in the consumption of carbohydrates and minerals when compared to the elderly physicians (P<0.001). Quarantine induced stress and anxiety showed in nearly one-fourth of the participants. Physicians reported that their quality of life (QoL) had adversely affected after the pandemic struck.

Conclusion: We obtained novel data for the first time on COVID-19 positive physicians' lifestyle and related behavioral changes. As the COVID-19 pandemic is ongoing, our data need to be investigated in future more extensive studies to develop interventions to mitigate the negative lifestyle behaviors to deal with the pandemic situation as well as future crises.

Introduction

COVID-19 originated in Wuhan, China, and as the prevalence of human-to-human propagation intensified, the World Health Organization (WHO) declared a pandemic on March 11, 2020.[1] The disease affects all ages[2,3], and countries have issued policies to prevent infections, such as "social distancing" and "lockdown".[4] COVID-19 leads to isolation because people have to remain at home to prevent infection, but this is likely to have a detrimental effect on the physical and mental health of individuals.[9] In particular, previous research has demonstrated government actions related to spatial distancing as being effective public health measures; however, they could also cause health problems other than COVID-19 infection such as psychological distress and fear.[10] Health must be considered in these circumstances since there is no reliable cure for this disease yet, and apart from vaccination, its resolution remains

1. Dr. Farzana Rahman, Medical Officer, Department of Community Medicine, Mugda Medical College, Dhaka.
2. Dr. Sumaira Sufrin, Assistant Professor, Department of Physiology, Mugda Medical College, Dhaka.
3. Dr. Asif Rashed, Assistant Professor, Department of Microbiology, Mugda Medical College, Dhaka.

Correspondent: Dr. Farzana Rahman, Medical Officer, Department of Community Medicine, Mugda Medical College, Dhaka. Mobile: +8801730-642252, E-mail: rfarzana921@gmail.com

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unpredictable. Therefore, it is essential to prioritize the preventive approach as practiced in Korea to stay protected and maintain health and wellbeing.[11]

COVID-19 is a global burden which continues to redefine daily lifestyle-related habits in a significant manner as the pandemic progresses through its different phases. 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.[1] These factors compound over time to radically change lifestyle-related behaviors, especially daily eating, activity and sleep behaviors that are known to be independent risk factors for metabolic complications such as obesity, diabetes and cardiovascular disorders.[2,3]

From the perspective of prevention, a healthy lifestyle is crucial.[12] Lifestyle has been defined diversely and comprehensively in research and is still being studied. According to Park (2019), lifestyle can be classified according to people's life patterns, and can be defined as a complex concept that involves a person's consciousness of life, values, and character.[13] Drinking, smoking, exercise, nutrition, and stress are also elements of lifestyle according to the WHO's definition of the term.[14] Previous studies have highlighted the importance of healthy lifestyles as they are crucial in maintaining and improving physical and mental health and improving the quality of life.[14,15] Previous research linking COVID-19 and lifestyle patterns illustrated that an individual's lifestyle is a crucial factor for preventing infectious diseases.[16]

Few preliminary studies from the west have highlighted a negative impact on various lifestyle-related behaviors as a potential implication of COVID-19. However, these studies were done during the complete lockdown phase and suffer from methodological limitations like less representative sample and non-validated tools for data collection. Moreover, the interplay of the severity of COVID-19 infection with different social, economic and cultural constructs in determining the extent of changes in lifestyle-related behaviors might vary from country to country.

There is a lack of evidence that evaluates the effect of COVID-19 on lifestyle-related behaviors among COVID positive physicians in Bangladesh. It is important to investigate some key questions such as which lifestyle behaviors are most affected, how severe is the impact of COVID-19 on these behaviors, what are the reasons for these changes and which demographic section is the most impacted. Considering these questions, we undertook this study to evaluate the overall impact of COVID-19 on lifestyle changes experienced by individuals during the pandemic.

However, most research has been conducted on lifestyle changes for certain age groups, and the number of studies on lifestyle for all age groups is insufficient.[17,18] There are few studies on how infectious diseases affect lifestyles, anxiety-stress, and quality of life. Therefore, this study summarizes these factors using basic data. Furthermore, based on the study of lifestyle conditions that have changed due to the pandemic, the research aims to be used as basic data for developing countermeasures that national and local governments can take in the event of a disaster.

Materials and Methods:

Study design and Study Participants

A web-based cross-sectional study was conducted on the general population to assess the impact of COVID-19 on daily lifestyle-related practices such as dietary, activity and sleep pattern using a validated questionnaire.

This study was a rapid, cross-sectional online survey conducted during the lockdown phase (March to May, 2021) in the Mugda Medical College hospital. The data were collected using Google Form web survey platform and telephonic interview. A standard study invitation message along with the link to the online survey was shared through personal and social contacts of the research group members via email, Facebook, Instagram, and WhatsApp. We also asked the participants to share the study link to increase study participants, which allowed us to conduct a nationwide survey, especially during the pandemic situation.

A brief description of the study, its objectives and the declaration of anonymity and confidentiality were given to the participants before administering the questionnaire shared via Google Form. Informed consent was taken from all the participants at the time of enrollment. Participants were also requested to be honest in their responses. Following this, the participants answered differential questions on the changes experienced in their lifestyle before and during the pandemic. During the survey, participants were able to stop study participation and leave the questionnaire at any stage before the submission process; in doing so, their responses would not be saved. Responses were saved only by clicking on the "submit" button provided at the end of the questionnaire.

A total of 84 responses were collected using the Google Form link and telephonic survey, after excluding responses that met exclusion criteria, duplicates and invalid entries. The final data included 61 COVID positive physicians

attended in RT-PCR test with positive test report aged >30 years who were actively working COVID-19 group at Mugda Medical College Hospital, Dhaka were selected purposively.

Life Style Indicators & Survey Questionnaire
Physical activity

To assess the impact of the COVID-19 pandemic on physical activity, questions were asked about the frequency and satisfaction regarding physical activity participation per week before and after the onset of COVID-19. The higher the score, the higher the level of participation and satisfaction with physical activity.

Activity participation

Six items for activity participation were also assessed. Such as activities of daily living (ADLs), leisure, social activity, work, education, and sleep during the week before and after COVID-19. A higher score indicated more frequent participation in various activities, as well as higher satisfaction with participation in activities.

Nutrition

Finally, nine items for nutrition were assessed to measure nutrition during the week before and after COVID-19 in order to measure the participants' nutritional status. The amount of carbohydrates, proteins, fats, vitamins, minerals, water, the participants consumed, and the frequency of drinking and smoking, were measured. For example, the participants were asked, "Before the COVID-19 pandemic, how often do you consume carbohydrate-rich foods such as rice, bread and flour in the last week?" Participants answered these questions by selecting one of the choice of the five-point Likert scale: (1) never, (2) 1–2 times per week, (3) 3–4 times per week, (4) 5–6 times per week, and (5) every day. A higher score indicated more consumption of each type of nutrition.

Survey questionnaire

The electronic survey questionnaire was designed to assess changes in multiple lifestyle-related behaviors such as eating, physical activity, sleep and other health related behaviors during the COVID-19 outbreak. The differential questionnaire used in this study was developed and validated as an extension of a short version lifestyle related practices questionnaire in COVID-19 positive physicians.[4] The questionnaire has three sections assessing socio-demographic details, changes in lifestyle related behavior and COVID-19 specific reasons for the changes in these behaviors. Section A comprises questions relating to general information and demographic data, self-reported anthropometric data and one question on change in weight status during COVID-19. Section B evaluates

changes in different lifestyle related behaviors such as eating habits, physical activity and sleep pattern during the pandemic. The domain on eating behavior consists of meal pattern, portion size, frequency of meals, food group consumption pattern, emotional eating and intake of high fat, salt and sugar (HFSS) foods and sugar-sweetened beverages (SSB) consumption. The domain on physical activity pattern has six items focusing on different components of activity such as aerobic exercise, involvement in household chores, leisure related activity, sitting and screen time. Two items are for assessment of sleep patterns, one item for daily stress levels and two items for stress related addictive behaviors such as smoking or tobacco consumption. Section C has 6 items assessing the perceived COVID-19 specific reasons for changes in lifestyle-related behaviors.

Statistical Analysis

Descriptive statistics of the participants' baseline characteristics and responses were provided as frequency and percentage for categorical variables. Continuous variables were reported as mean and standard deviation or median and range/interquartile range according to the distribution. The responses for before-COVID-19 lifestyle scores and during-COVID-19 lifestyle scores were assessed and these scores were subtracted for each item giving the mean difference scores which were associated with demographic variables. The association between the categorical variables was assessed using Chi-squares. For all analyses, P d" 0.05 was considered as statistically significant. All statistical analyses were performed by using SPSS ver. 23 (IBM, Chicago, IL, USA).

Results

A total of 61 COVID-19 positive physicians were finally included in the analysis. Of them, majority i.e 70% (n=43) were male and rest were female i.e 30% (n=18) as shown in Figure-1.
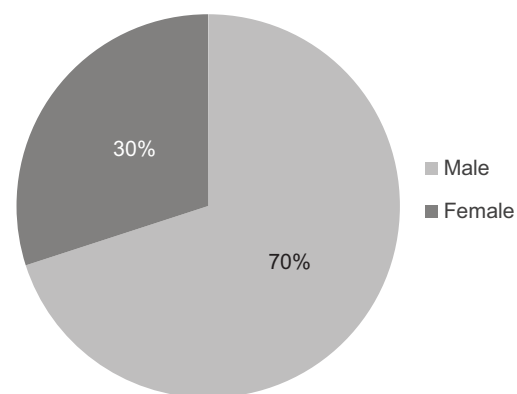

Figure 1: *Sex distribution of COVID-19 positive physician*

The demographic details of the included participants (n = 61) is shown in Table-1. The sample had higher male participation 70% with the mean age of 35.33$\pm$12.5 (range, 31-60) years. The representation from different socio-economic strata and place of residence was fairly equal, with slightly greater number of participants from metropolitan cities (43.1%). The mean self-reported body mass index (BMI) was 24.84.7 kg/m^2. Almost one third participants reported a gain in weight during COVID-19 pandemic.

With regards to lifestyle changes during the COVID-19 lockdown, most of the population declares not to have changed its habits (46.1%). While 16.7% and 37.2% feel to have improved them or made them worse, respectively. In particular, smoking habits have been reduced during the lockdown and sleep hours have increased P<0.001. Participants reporting more than 8 hours of sleep increased (10.2% vs 27.8%) but the overall quality of sleep marginally declined (49.9% vs 45.8%) as shown in Table-II.

Table-1

Demographic profile of participants and anthropometrics

Characteristics	Value
	(whole sample n = 61)
Age (Years)	35.3312.5
31-40	41 (67.21)
41-50	17 (27.87)
51-60	3 (4.92)
Type of residence	
Metropolitan Cities	36 (59)
Mid-Level Cities	13 (21)
Small Cities	12 (20.7)
Marital Status	
Married	53 (56.55)
Single	8 (13.11)
Family Status	
Nuclear	17 (27.87)
Extended	41 (67.21)
Joint	3 (4.92)
Anthropometric Parameters	
Weight (kg)	66.8713.16
Height (cm)	157.688.47
Self-reported BMI (kg/m^2)	24.84.7
Class of BMI	
Under weight	0
Normal weight	58 (95.08)
Over weight	2 (3.28)
Obesity	1 (1.64)
Impact of COVID-19 on BMI (kg/m^2)	
Weight gain during COVID-19	19 (31.5)
Weight loss during COVID-19	12 (13.8)
Stable weight during COVID-19	30 (47.9)

Values are presented as mean standard deviation or number (frequency %)

Table-II

Smoking and sleep habits before and after COVID-19 infection

Smoking History	Smoking before COVID-19	Smoking after COVID-19
No	45 (73.77)	54 (88.34)
Yes; < 3 Cigarettes/day	10 (16.39)	6 (9.54)
4-6 Cigarettes/day	5 (8.16)	1 (1.64)
> 7 Cigarettes/day	1 (1.64)	0
Sleep Pattern		
Daily hours of sleep;		
< 6 hours	10 (16.4)	8 (13.7)
6-8 hours	45 (73.4)	36 (58.5)
> 8 hours	6 (10.2)	17 (27.8)
Quality of sleep;		
Excellent	2 (0.8)	1 (2.4)
Good	3 (4.8)	5 (8.5)
Very Good	27 (45.1)	23 (37.3)
Bad	19 (31.8)	18 (29.9)
Very Bad	10 (17.8)	13 (21.8)

Responses for differential items assessing the changes in lifestyle-related practice before and during COVID-19 is given in Table-III. The habit of consuming meals routinely at regular intervals has slightly increased during COVID-19 (42.5% vs 49.7%). Participants reported marginal improvement in the frequency of consumption of different food groups such as fruits and vegetables (34% vs 38%). Milk and its products (38.1% vs 40%) and pulses, meats and egg (18.3% vs 24.1%) during COVID-19.

Table III

Change in food intake/eating behavior according to COVID-19 (n = 61)

	Before			After			P-value
	M	SD	f (=%)	M	SD	f (=%)	
Balanced diet including healthy ingredients (whole wheat, pulses, legumes, eggs, nut, fruits and vegetables).	2.93	0.50	21 (33.8%)	2.99	.055	40 (38.5%)	0.038
Carbohydrate	2.84	0.48	26 (42.5%)	3.9	0.04	35 (49.7%)	0.046
Protein	2.49	0.53	12 (20.2%)	2.48	0.56	49 (80.33%)	0.830
Fat	1.98	0.56	15 (23.9%)	1.99	0.57	8 (12.6%)	0.765
Vitamin & Minerals	2.66	0.75	24 (34.1%)	2.73	0.69	37 (37.9%)	0.113
Milk or its products (Curd, lassi, cheese, paneer etc.)	2.07	0.57	25 (38.1%)	2.15	0.58	36 (40.0%)	0.014
Sugar sweetened beverages	3.01	1.39	16 (25.3%)	3.14	1.33	13 (21.9%)	0.129

In the physical activity domain, an increase in participants not routinely exercising for 30 min was observed (38.5% vs 50.5%). Although, participants exercising more than three days a week (45.4% vs 45.2%) before the pandemic maintained the habit of exercising during the pandemic as well. Participants refraining from routinely involvement in leisure-related physical activity also increased by more than double (29.4% vs 65.9%). One third participants reported a daily screen time of 4-5 hours during COVID-19 (13.2% vs 32.6%).

Table IV

Changes in Physical Activity Behavior

	Before COVID-19; n (%)	After COVID-19; n (%)
Participation in 30 min of moderate intensity aerobic exercises		
Not routinely	24 (38.5)	30 (50.5)
1-2 days/week	10 (15.9)	4 (4.3)
3-4 days/week	9 (14.4)	9 (14.5)
5-6 days/week	6 (10.3)	6 (10.3)
Almost Daily	12 (20.7)	12 (20.4)
Participation in household chores (cooking, laundry, cleaning)		
Not routinely	20 (33.2)	23 (38.0)
1-2 days/week	13 (22.3)	1 (2.2)
3-4 days/week	7 (11.3)	11 (15.9)
5-6 days/week	4 (4.6)	4 (8.7)
Almost Daily	17 (28.6)	22 (35.2)
Participation in leisure related activities (grocery shopping, walking, gardening)		
Not routinely	18 (29.4)	40 (65.9)
1-2 days/week	19 (31.5)	1 (2.7)
3-4 days/week	12 (20.0)	9 (15.5)
5-6 days/week	4 (5.9)	4 (4.9)
Almost Daily	8 (13.2)	7 (10.9)

Stress among the study participants was measured using the scale GAD-7. Comparing the mean of each item and the total score on the GAD-7, the mean and total points of each item during COVID-19 decreased. When compared before and after COVID-19, the anxiety scores of the participants significantly increased in all sub-categories (p<0.001). In addition, significant changes were observed when total scores were compared (p<0.001). This indicates that the higher the total score, the greater the severity of anxiety. The overall stress amongst participants increased and the more likely that mental health was caused by the pandemic situation. as shown in Table-V.

Table V

Change in level of stress or anxiety

	Before COVID-19; n (%)	After COVID-19; n (%)	P-value
Not at all	13 (21.3)	12 (20.3)	0.386
A little/mild anxiety	33 (53.7)	25 (41.4)	P<0.05
Moderate/much anxiety	11 (17.9)	15 (24.2)	P<0.05
Severe anxiety	4 (7.14)	8 (14.1)	P<0.003
Total score (Mean±SD)	70.15± 10.92	63.00 13.10	P<0.001

The study revealed changing perception of COVID-19 after recovering from infection; less fear, increase fear, try to decrease fear about other diseases were 40.02%, 38.2%, 5.56% respectively as shown in Table-VI.

Table VI

Perception of COVID-19 after recovering from emergence

Changes in life after recovering from COVID-19	Values; n (%)
less fear about covid-19	28 (40.02)
increase fear about covid-19	23 (38.2)
wash hands more frequently than before	6 (10.0)
increase use of mask	1 (1.69)
avoid gathering	1 (1.69)
try to decrease fear about the diseases of others	4 (5.56)

The comparison of mean scores of lifestyle related behaviors before and during COVID-19 is shown in Tas e 3 There was a significant increase in routine consumption of meals at regular intervals during COVID-19. There was significant improvement in healthy eating in terms of

frequency of your fruits and vegetables intake (0.15 [1.41], P<0.05) and consumption of pulses, egg or meat and consumption of balanced diet (0.14(1.21], P<0.05). Sugar Sweetened beverages significantly declined during COVID-19. Participation in moderate intensity aerobic exercises declined significantly (-0.20(1.61], P<0.05). The overall participation in household chores significantly increased (0.27(1.48], P<0.001), whereas participation in leisure related activities significantly decreased (-0.49(1.49], P<0.001).

Other health-related behaviors such as daily sleeping hours (0.20(0.58], P<0.001) and screen time (-0.45(0.93], P<0.001) and sitting time at work (-0.12(137], P<0.001) significantly increased. The stress levels during COVID-19 also significantly increased (-0.23(1.01], P<0.001) but smoking (0.02(0.03], P<0.05) significantly decrease. Social support extended by family and friends to maintain healthy lifestyle-related behaviors also significantly increased (0.09(0.85], P<0.001).

Table VII

Impact of COVID-19 on lifestyle related behavior (comparison of mean score before and during COVID-19)

Question	Before COVID-19 Score Mean (SD)	During COVID-19 Score Mean (SD)	P-value
Consumption of regular meal pattern	331 (1.69)	3.62 (1.60)	<0.001
Frequency of your fruits and vegetables intake	339 (1.40)	3.55(1.40)	0.001
Consumption of balanced diet	3.42 (1.40)	3.58 (1.42)	0.002
Consumption of milk or its products	3.37 (1.52)	3.41 (1.55)	0.542
Consumption of pulses, egg or meat	2.82(1.37)	2.96 (1.45)	0.001
Consumption of sugar	3.57 (0.96)	3.56 (0.99)	0.268
Consumption of sugar sweetened beverages	4.24(1.02)	4.45 (0.94)	<0.001
Participation in moderate intensity aerobic exercises	2.59 (1.57)	2.46(1.64)	0.002
Participation in household chores (cooking, laundry, cleaning)	2.73 (1.63)	3.01 (1.74)	<0.001
Participation in leisure related activities (grocery shopping, walking in park, gardening)	2.42 (1.32)	1.92(1.41)	<0.001
Daily hours of sleep	1.94(0.51)	2.14 (0.63)	<0.001
Quality of sleep	3.60 (0.86)	3.60 (1.00)	0.873
Level of stress or anxiety	3.88 (0.86)	3.64(1.04)	<0.001
Smoking	4.91 (0.41)	4.94 (0.32)	0.004
Social support	4.15(1.09)	4-25 (1.08)	<0.001

Discussion

This study provides a timely investigation of changes in the multifaceted lifestyles (physical activity, participation in activities, and nutrition) of adults during the COVID-19 pandemic in South Korea. The major findings of this study indicate that COVID-19 has had a negative impact on healthy and active lifestyles, as well as mental health and quality of life. This study illustrated significant reductions in physical activities and activity participation, such as activities of daily living, social activity, leisure, and education. Conversely, eating habits (nutrition) did not significantly changed. However, mental health and quality of life also decreased according to individual lifestyles during the pandemic. The outbreak of COVID-19 and measures of its containment has evident impact on the lifestyle related behaviors in the population [5]. Experts believe that lifestyle related predictors of weight gain and cardiometabolic risk are modifiable and should be screened and addressed during COVID-19 to prevent obesity and maintain general wellbeing.[6]

This study showed that the frequency and time of all types of physical activities decreased during the pandemic compared to earlier periods. Unsurprisingly, satisfaction with participation in physical activities decreased. The findings of our study regarding reduced physical activity during the pandemic follow those of other studies.[26–29] Similarly, Gornicka et al. reported that COVID-19 had a negative effect on physical activity in adults. These results are consistent with a previous study in Canada that reported a significant reduction in all physical activities in children and adolescents [29]. Various restrictions to prevent the spread of COVID-19, including home confinement and social distancing, worked to reduce the overall physical activity level. It has been established that reduced physical activity leads to increased body weight and risk of illness, including inflammatory and cardiometabolic diseases.[30] Several studies have demonstrated that patients with metabolic disorders have a higher risk of contracting the disease.[22,23]

The key findings of the survey divulge certain trends in the eating habits and physical activity behavior. Firstly, a healthy eating trend was observed in terms of slight improvement in routine consumption of meals at regular intervals and consumption of protein-rich foods such as pulses, eggs and meat along with restricted intake of high fat, sugar, salt (HFSS) food items, especially in the younger population (age group 31-40 years). Secondly, there was a significant reduction in moderate intensity aerobic exercises as well as leisure related activities coupled with an increase in daily screen and sitting time. Overall, physical inactivity was comparatively higher in men and

participants belonging to upper socio-economic groups. Thirdly, quarantine induced stress and anxiety increased by a unit in almost one-fourth of the participants.

The findings indicate that the participants improved slightly in terms of consuming meals at regular intervals on routinely basis. Regular meal pattern as a construct is often described as an individual's eating patterns at the level of a 'meal', such as a main meal (for example, breakfast, lunch or dinner) or a smaller-sized meal (for example, supper or snack).[7] The consumption of nutritionally balanced small and frequent meals is associated with better dietary quality and is a common clinical recommendation for weight loss and reduction in metabolic comorbidities [8]. The participants in our study also reported higher consumption of protein-rich foods such as pulses, eggs and meat. This is, however, contrary to the findings of another study conducted in the west, which found that daily consumption of regular meals had marginally lower contribution to the overall improvement in eating behavior during COVID-19.[10] A possible reason for this difference could be higher focus on home cooked food in the households.

The pandemic has also brought about significant changes in daily living patterns among physicians in Bangladesh. With changed daily schedules caused by social distancing, the closure of colleges, universities, and shops, and telecommuting, participants revealed changes in how they preoccupied themselves, in which they tended to spend less time on social activities, leisure, and education. The total time participants spent sleeping was significantly higher than that before the pandemic. However, although their total sleep time increased, satisfaction with sleep decreased. This implies that the participants may have had poor sleep quality or patterns. According to an Australian report, 40.7% of Australian adults reported a negative change in sleep patterns since the onset of the pandemic.[24] The imbalance in occupation and changed sleep routines can have negative effects on individuals' health and quality of life.[25-27] thus, thus it is necessary to provide appropriate strategies to rebuild balanced lifestyle patterns.

The study also highlights the association of demographic variables with changes in lifestyle related behaviors due to COVID-19 pandemic. In our study, a significant improvement was observed in overall eating behavior in the younger age group (<30 years). Similar findings were reported in an Italian survey, where the highest compliance to a traditional Mediterranean diet (high in antioxidants from fruits and vegetables and MUFA from olive oil and fish) was exhibited by younger people (18–30 years).[12] Eating behavior also significantly improved in upper socio-

economic status but conversely the physical activity decreased. Despite decline in food availability, the upper strata of society had the economic means and time to procure and maintain access to healthier ingredients (such as fresh fruits and vegetables, nuts, oilseed, milk and products) and transform them into healthy meals. It has been already seen in China that level of lockdown and socio-economic status defined level of physical activity.[16] In addition, we also found out that changes in these lifestyle related behaviors led to weight gain in almost one-third of the sample. Since individuals with obesity and associated metabolic comorbidities such as diabetes and cardiometabolic disease are more prone to getting COVID-19 infection[17,18] the control on adaptation of negative lifestyle related behaviors becomes a crucial preventive step in containing the spread.[19]

Our findings should be considered in the context of their strengths and limitations. One strength of this study is its novelty; to the best of the researchers' knowledge, this is the first study on the multifaceted lifestyle changes that occurred before and after the pandemic in South Korea. We used an online survey, which was an ideal research tool that allowed the recruitment of samples from different regions in South Korea without increasing the risk of coronavirus transmission. However, this study had several limitations.

The main limitation of the present study is represented by a self-reported questionnaire, which may lead to the actual misreporting of data. However, our web-survey was similar to others that have been frequently employed. A strength of our study was represented by the fact that the survey was conducted quickly in the most critical period of the lockdown. Previous research has reported that the different perspective of different people regarding COVID-19 might impact their daily lifestyles, mental health, and quality of life [30]. Therefore, in future studies, peoples' perception of COVID-19 should be considered by conducting relevant assessments, using tools such as the Fear of the COVID-19 Scale (FCoV-19S).[10]

Conclusion

This is the first study in Bangladesh among physicians with COVID-19 which aimed to recruit a representative sample for collection of data using a pre-validated questionnaire to study the impact of COVID-19 on lifestyle related behaviors. Possibilities of reporting bias, due to e-survey and telephonic survey and validity of answers is a general problem of online surveys. Decreased participation in physical activities and meaningful activities such as social activities, leisure, and education, were identified among COVID-19 Positive Physicians. The pandemic is still ongoing, these findings may have crucial public health implications and provide evidence for the development of future intervention studies. More extensive studies of lifestyle behavioral changes are warranted to confirm our results and the long-term effects of the current crisis on global health.

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