



ASSOCIATION BETWEEN NUTRITIONAL STATUS AND MENTAL HEALTH AMONG ADULTS DURING COVID-19 PANDEMIC IN KHULNA CITY CORPORATION

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Abstract

The SARS-CoV-2 (COVIDs-19) pandemic made a massive impact on sudden lifestyle and food habit changes. A person's way of life, mental health, and physical health are all intertwined. Individual dietary intake and nutritional status are major elements that influence mental health. COVID-19 makes the immune system weaker than its usual times. A balanced diet is necessary to recover and to prevent the immune system for fighting against the viruses. Millions of households have experienced mobility constraints and lifestyle adjustments as a result of COVID-19 over the course of several months. The aims of the research is just to see how COVID-19 affects people's lifestyles and mental health for the change of food habits among adult population in Khulna City. Primary data was used to perform this research which was collected from adult population in Khulna City with a well-organized questionnaire. For satisfying our study purposes, some statistical methods would be applied. A significant change in mental health was found due to the impact of the situation of COVID-19 lockdown in the food habit. Female respondents (58.7%) had faced a crises on their sleep also in dietary pattern. 53.4% respondents were physically exhausted when most the respondents had a significance correlation with physical exercise with weight changes. A negative impact have been showed up in the survey as respondents were in lockdown situation which affected both financial condition and psychological environment.

Keywords: SARS-CoV-2, Food Habit, Mental Health, Nutritional Status, Adults, Logistic Regression.

Introduction

The novel coronavirus disease (COVID-19) pandemic has brought a slew of new problems and changes to human life throughout the world, having a profound effect on human health, social life, and lifestyle, as well as the local and global economy (Ammar, A. *et al.*, 2020). The World Health Organization (WHO) had declared the outbreak a worldwide pandemic on March 11, 2020, after it first appeared at Wuhan city in China in December 2019 and spread over the globe in the following months (Ammar A. *et al.*, 2020). The WHO reported confirmed infected cases of coronavirus around 211.74 million and around 4.45 million deaths globally on August 16, 2021 (Ammar, A. *et al.*, 2020). In reaction to the disease's rapid spread, governments throughout the world were forced to implement harsh measures as complete or partial lockdowns, quarantine, isolation and also social distance. (Bangladesh, n.d.). As a consequence of this pandemic, the Bangladeshi government responded swiftly to prevent the virus from spreading. Complete, partial lockdowns were implemented, non-

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essential public places were closed, and telework, distance learning, and information and sanitization desks were set up around the city, as well as in the majority of nations, as part of the actions taken against COVID-19.

According to World Bank figures, Bangladesh's total population in 2020 was around 164.7 million people (Pfefferbaum, B. & North, C. S., 2020). However, approximately 21 million people reside in Dhaka (Cinelli, M., 2020), which represents approximately 12.75 percent of the total population and a high density index based on area size. In addition, this research provides a unique chance to examine the impact of COVID-19 on Bangladeshi dietary and lifestyle choices. Accessibility and availability of food are unquestionably altered during the confinement, which has a great impact on diet quality (Koh, D., 2020). The potential of lesser income, job losses, and uncertainty about the future may encourage individuals to cut back on their expenditures, particularly on food, and choose for more pleasurable, affordable, and potentially unhealthy alternatives ("Dhaka population, 2021). Diet influences a variety of factors, but immunological status in the short term, when it should be at its most active, is among the most significant. Nonetheless, research indicates that during the lockdown, people engaged in poor nutritional behaviors, including increased caloric intake, increased snacking, decreased consumption of nutritious fruits and vegetables, and weight gain (Di Renzo, L. et al., 2020).

The food pyramid in Bangladesh contains five consumption levels. At the base of the pyramid, rice, bread, and other grains should be ingested in big amounts. On the second level, an abundance of vegetables and fruits are eaten. Fish, meat, eggs, and beans should all be ingested with moderation, followed by milk and dairy products. In moderation, fats, oils, and sugar should be ingested near the top of the pyramid (Ammar, A. et al., 2020). The traditional Bangladeshi diet consists of fruits (apple, papaya, guava, etc.), vegetables, bread, rice, and other cereals with a high fiber and protein content, low fat and cholesterol content; including foods rich in vitamins A, B, C, D, E, folate, and B-complex, which are all essential for a healthy immune response. Moreover, a significant portion of the population lives in rural regions, where fruits, vegetables, and cereals are mainstays. Consequently, it would be intriguing to monitor any changes in dietary habits throughout the COVID-19 outbreak (Ammar, A. et al., 2020).

During quarantine, levels of physical activity were similarly reduced (Emily A Holmes et al., n.d.) (Scarmozzino, F. & Visioli, F., 2020). Complete lockdowns, the closing of sports facilities, parks, and general movement restrictions have all hampered people's ability in engaging in physical activity. There was also an increment in sedentary habits associated with quarantine, such as remote learning and telework (Gardner, B. & Rebar, A. L. 2019). Emerging infectious diseases reaching pandemic levels, such as SARS-CoV, MERS-CoV, and SARS-CoV-2, have a massive mental impact and cause stressful mental health symptoms, with anxiety being the most common. Anxiety, uncertainty, food instability, and limited healthcare access might impact eating disorders and obesity (Giugliano, D. 2008 & Jiménez-Pavón, D., 2020). Anxiety, uncertainty, food insecurity, and limited access to care may impact eating disorders and obesity (Makansi, N. et al. 2018 and Martínez-González, M. A., 2019).

Unknown viral transmission methods, future uncertainty, media distortion, and quarantine all affect epidemics' psychological effect (Mattioli, A.V. et al. 2020 and World Health Organization, 2020). Stressful events worsen interrupted sleep patterns and insomnia, as well as reduced physical activity, poor eating habits, and sedentary lifestyle behaviors (Mélanie Deschasaux-Tanguy, et al. 2015).

This research uses a face-to-face survey to examine the impact of quarantine on adult people of Khulna City Corporation's eating, exercising, stress, and sleeping habits. Before and after the lockdown, lifestyle and eating patterns were compared to understand the consequences of COVID-19-induced confinement rules on Khulna City Corporation adults. During the lockdown, dietary intake was examined to assess the risks of nutritional scarcities and their impact on lifestyle.

Materials and Methods

Study design and participants

From April to May 2022, a population-based (cross-sectional) study was done in Khulna, Bangladesh to find out how the coronavirus pandemic and lockdown affected the people's eating habits and way of life. Cross-sectional studies are usually not used to compare results from before and after because there is no clear order of events. However, they are the best design to use when there is no data from before and inferences must be made. Given that COVID-19 came out of nowhere, the goal of this study was to figure out how bad the pandemic was by looking at things that can change quickly, like lifestyle and eating habits.

All adults over the age of 18 living in Khulna City Corporation were included in the target population. These were asked to take part in a face-to-face survey utilizing convenience sampling procedures to ensure randomization and participant recruitment. This research comprised a total of 308 participants (57.8% of whom were men). For the survey, a questionnaire was retrieved and data was gathered via a face-to-face survey. An information sheet and permission form were supplied on the opening page of the survey, stating that participants might withdraw at any moment. Participants were not compensated and all data was obtained anonymously with no indication of identifying information.

Survey questionnaire

In English, a multi-part, self-administered questionnaire was created. Prior to and throughout the COVID-19 confinement, this survey asked about nutritional and lifestyle behaviors. After being evaluated by the research team, the survey was pilot tested with 20 persons from the Khulna City Corporation region. The survey questionnaire was somewhat altered after the pilot testing. The survey questionnaire was broken into five sections and had 56 questions: (i) Personal Information (15 questions) (ii) Dietary Intake related Information (16 questions) (iii) Life Style related Information (20 questions) (iv) Health related Information (4 questions) (v) Family History (1 question). Questions from the questionnaire were asked twice; once it was regarding the period before the pandemic (Before-COVID-19) and the other when the period during lockdown situation (During COVID-19).

Statistical analysis

Counts and percentages are used to illustrate categorical variables. The paired sample t test was used to examine the difference between categorical variables before and during the COVID-19 pandemic, and the chi-square test was used to examine the connection between categorical variables. In a sub-analysis, weight and some behavioral characteristics were also examined across groups. The data was stratified according to gender, age, and educational level. The principal component analysis (PCA) was used to categorize data on dietary patterns. Values greater than 0.3 were judged to have an influence on component creation in this study. The total of the component loadings of each group category was used to provide a score to each participant. The results were significant when the p value was less than 0.05. Software titled The Statistical Package for the Social Sciences (SPSS) version 20.0 was used for statistical analysis.

Results

Demographic characteristic

A total of 308 people responded to the survey. The population living in Khulna City Corporation was represented by the sample distribution from different thanas. Khulna Sadar Thana and Khalishpur Thana have the biggest number of participants. Local coverage, in particular, extends to all thanas of Khulna City: Daulatpur Thana has 19.8 percent of participants, Khan Jahan Ali Thana has 3.9 percent, Khalishpur Thana has 23.0 percent, Sonadanga Thana has 17.5 percent, and Khulna Sadar Thana has 35.8 percent. The survey was completed entirely in English by all participants. Table 1 provides detailed information on the demographic demographics of the research population. Females made up the majority of participants (58.2%), who were between the ages of 18

and 35, were married (53.2%), had 1-2 children (46.81%), had a bachelor's degree (54.6%), and worked full-time (13.3%). Almost half of the individuals said they had gained weight since the lockdown began (46.8%). However, 25.5 percent said they had lost weight, 22.7 percent said they had maintained their weight, and 5.0 percent said they didn't know if they had gained or lost weight.

Table 1. Demographic characteristics of study participants ($n = 308$)

Variables	Frequency (n)	Percentage (%)
Age group (Years)		
18-35	179	58.2
36-45	55	17.7
46-60	57	18.4
>60	17	5.7
Gender		
Male	129	41.8
Female	179	58.2
Marital Status		
Married	164	53.2
Unmarried	131	42.6
Divorced	2	0.7
Widowed	11	3.5
Education level		
Less than high school	26	8.5
High school	38	12.1
College/ Diploma	48	15.6
Bachelor's degree	168	54.6
Higher than bachelor's degree	28	9.2
Number of children		
None	131	42.6
1-2	144	46.81
≥ 3	33	10.59
Employment status		
Full-time	41	13.3
Part-time	5	1.5
Self-employed	25	8.1
Student	162	52.6
Unemployed	9	3
Others	66	21.5
Weight change during pandemic		
Lost weight	79	25.5
Gained weight	144	46.8
Maintained weight	70	22.7
Do not know	15	5.0
Address (Thana based)		
Daulatpur Thana	61	19.8
Khan Jahan Ali Thana	12	3.9
Khalispur Thana	71	23.0
Sonadanga Thana	54	17.5
Khulna Sadar Thana	110	35.8

Source of information

In response to the most common sources of information for the health tips, 69.5% reported relying on Internet. Social Medias were the second source of information with around 64.5%. Television, Friends and Family and newspaper were gradually the common sources with 58.9%, 48.9% and 39% respectively. In response to the most common sources of information for COVID-19 updates, 69.5% reported relying on social-media. Television was the second source of information with around 67.4%. Internet, Friends and Family and newspaper were gradually the common sources with 66.7%, 50.4% and 45.4% respectively.

Table 2. Sources of health tips and COVID-19 related information during COVID-19 situation

Source of information	Health tips from social media, % (n)	Covid-19 information from social media, % (n)
Newspaper	39.0 (55)	45.4 (64)
Television	58.9 (83)	67.4 (95)
Internet	69.5 (98)	66.7 (94)
Social Media	64.5 (91)	69.5 (98)
Local Government Announcement	28.4 (40)	34.8 (49)
Doctor	25.5 (36)	34.0 (48)
Friends and Family	48.9 (69)	50.4 (71)
Others	10.6 (15)	8.5 (12)

Shopping

The majority of individuals began storing goods during the time of pandemic (66.2 %), did not purchase groceries online (56.0 %), examined food labels before purchasing any products (85.1%), and sterilized or cleaned foodstuffs before keeping them (93.3 %), according to the findings. (Table 3).

Table 3. Shopping practices during COVID-19 situation (n = 308)

Variables	Categories	During Covid-19, % (n)
Online grocery shopping	Yes	44.0 (136)
	No	56.0 (172)
Start stocking up on foods	Yes	66.2 (204)
	No	33.8 (104)
Reading food labels	Yes	85.1 (262)
	No	14.9 (46)
Sanitizing or cleaning groceries	Yes	93.3 (287)
	No	6.7 (21)

Physical activity

Figure 1 (a) shows that 31.9 percent of participants did not engage in any physical activity prior to the coronavirus pandemic, and that percentage fell to 31.2 percent during the pandemic, while exercise for 45 minutes or less decreased to 57.4 percent to 55.3 percent, 45-60 minutes increased to 7.1 percent to 9.9 percent, and 60-90 minutes increased to 7.1 percent to 9.9 percent. Furthermore, Figure 1 (b) demonstrates that there was no significant relationship between the frequency with which participants engaged in physical activity throughout the pandemic and their reported weight change. 16.31% lost weight and 19.85% gained weight with no training,

while 16.31% maintained weight with 45 minutes or less. Furthermore, 4.97% of people who did not perform physical activity.

Screen time

During the pandemic, a considerably larger number of individuals (36.0%) spent 5-6 hours per day using the computer for study or job purposes than before the epidemic (28%) ($p = 0.001$). Similarly, the number of individuals who spent 3-4 hours per day watching screens for enjoyment jumped from 12.1% before the lockdown to 20.6 percent after the lockdown ($p < 0.001$).

Mental situation

Figure 2 shows that almost 59.6% and 47.1% of the respondents were not feeling nervousness and irritable respectively while 53.4% were feeling physically exhausted several days. Along with these, majority of the respondents were in depression (38.8%) several days.

Table 4. Daily activities before and during COVID-19 situation ($n = 308$)

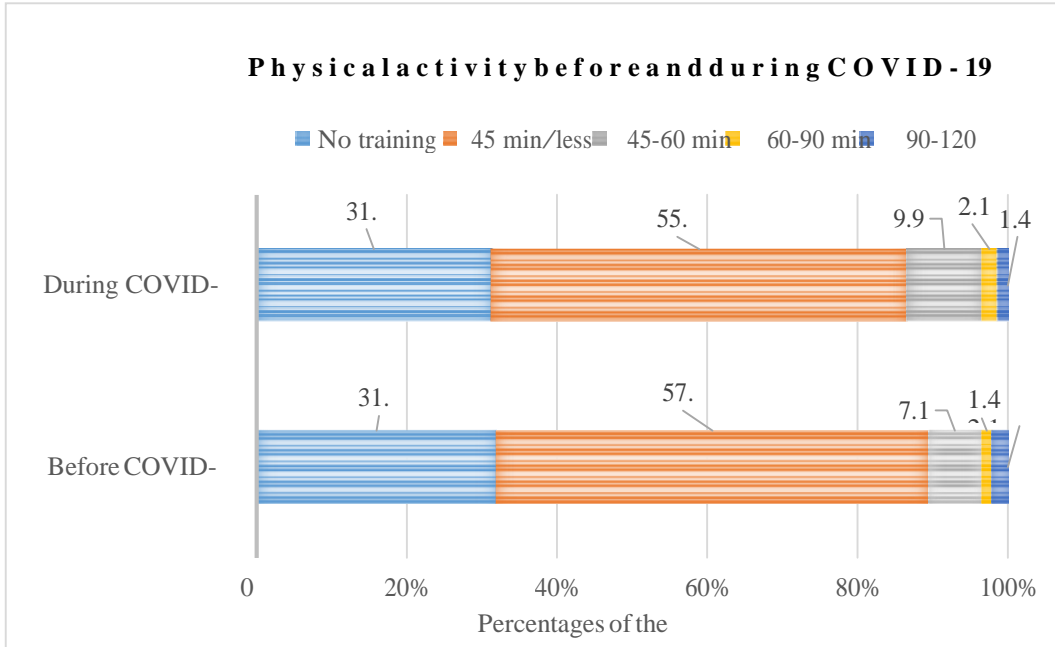
Variables	Before COVID-19, % (n)	During Covid-19, % (n)	p-Value
Screen time for work/study purpose			
<5 hr./day	50.4 (155)	40.4 (124)	0.001
5-6 hr./day	19.9 (61)	25.5 (79)	
6-7 hr./day	14.2 (44)	14.9 (46)	
7-8 hr./day	2.1 (7)	3.5 (11)	
8-10 hr./day	2.8 (9)	4.3 (13)	
>10 hr./day	1.4 (4)	2.8 (9)	
Did not use	9.2 (28)	8.5 (26)	
Screen time for entertainment			
<2	39.7 (122)	29.1 (90)	<0.001
2-3	29.8 (92)	25.5 (79)	
3-4	12.1 (37)	20.6 (63)	
5-6	6.4 (20)	9.2 (28)	
>6	5.0 (15)	8.5 (26)	
Did not use	7.1 (22)	7.1 (22)	

Sleep

The percentage of individuals who reported sleeping 5-6 hours per night had decreased significantly from 58.9% before the time of pandemic to 51.8% after the epidemic ($p < 0.001$). (Table 5). However, during the pandemic, a greater number of individuals (47.5%) reported poor sleep quality compared to before the pandemic (31.2%) ($p < 0.001$), and sleep disruptions were significantly more prevalent (56.0%) during the epidemic compared to before the pandemic (37.6 percent). As a result, 30.5 percent of those polled said they were under-energized during the epidemic, compared to only 19.1 percent before it ($p < 0.001$) (Table 5). This indicates the majority of participants had described their health status in the time of the outbreak as poor health status.

Table 6 shows an examination of weight, BMI status and behavioral characteristics by sex and age groups and educational level. Females reported much higher physical activity (81.56 percent vs. 18.44 percent; $p = 0.524$), as well as significantly more screen time (81.55% vs. 18.45%; $p = 0.946$). Females, on the other hand, had

a)



b)

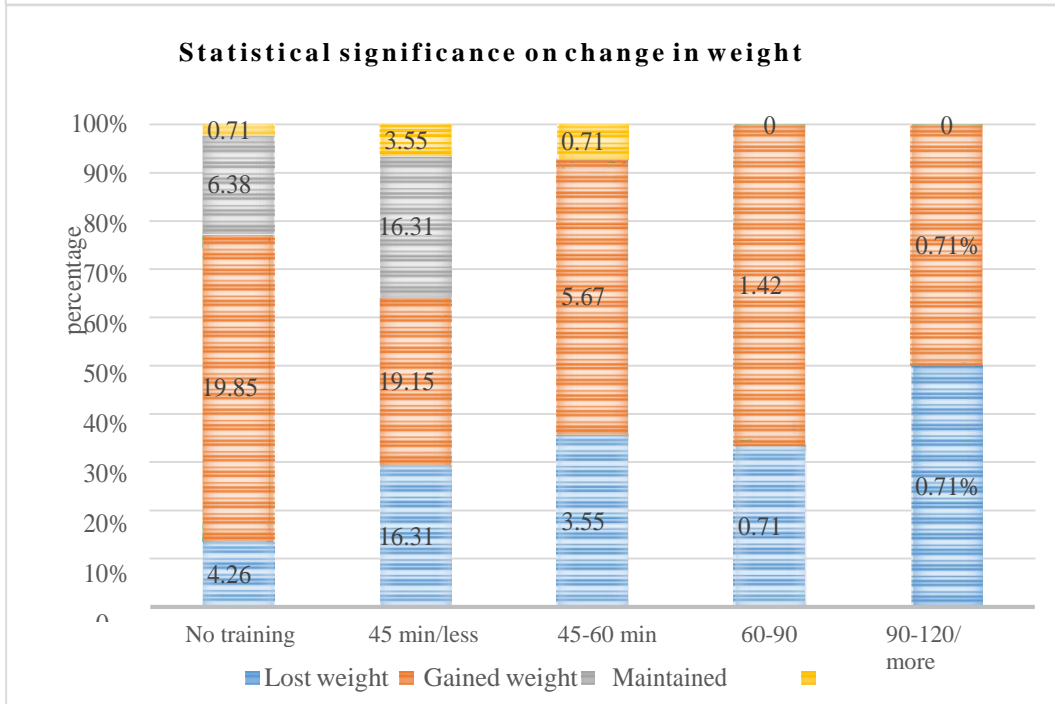


Figure 1. Physical activity before and during COVID-19 situation. (a) Frequency (percentage) and (b) Change in weight.

a considerably larger rise in sleep disruptions ($p = 0.046$). Furthermore, participants between the ages of 18 and 35 reported more weight increase and 3 times the amount of meals taken each day ($p = 0.594$ and $p = 0.362$, respectively). Participants aged 18–35 had the greatest impact on sleep duration and quality ($p = 0.187$). There seemed to be no significant relation between education levels and lifestyle changes (Table 6).

Table 5. Sleep before and during COVID-19 situation ($n = 308$)

Variables	Before COVID-19, % (n)	During Covid-19, % (n)	p-value
Hours of sleep per night			
5-6	58.9 (182)	51.8 (160)	<0.001
7-8	37.6 (116)	34.8 (107)	
9-10	2.1 (6)	9.9 (30)	
>10	1.4 (4)	3.5 (11)	
How would you rate your sleep quality			
Difficulties with falling sleep	31.2 (96)	47.5 (146)	<0.001
Fitful sleep	32.6 (100)	24.1 (74)	
Restful	36.2 (112)	28.4 (88)	
Do you feel any disturbances during sleep			
Yes	37.6 (116)	56.0 (172)	<0.001
No	62.4 (192)	44.0 (136)	
Describe your energy level			
Poor	19.1 (59)	30.5 (94)	<0.001
Good	70.2 (216)	62.4 (192)	
Very good	10.7 (33)	7.1 (22)	

Discussion

During the COVID-19 pandemic, this population-based, cross-sectional research surveyed Khulna City Corporation inhabitants face-to-face about their dietary and lifestyle habits. According to the findings, the COVID-19 pandemic and related lockdown resulted in weight gain in around half of the respondents, as well as changes in important dietary and lifestyle patterns considered necessary for optimal physical and mental health.

The present research indicated that eating patterns were shifting away from suggested dietary requirements and toward "unhealthy" eating habits, high in calories but deficient in nutritional density; a potentially unfavorable combination for immunological condition. Despite preparing more homemade meals, which is associated to a healthy weight, non-nutritious goods were selected and eaten more. These figures suggest changes in home-cooked and eaten meals. Kuwait, the U.S., Italy, and France found a surge in calorie intake and weight gain under COVID-19 home confinement (Todisco, P. & Donini, L. M. 2021; Wu, P. 2009; AlMughamis, N., 2020). Kuwait, a nearby Gulf country to the UAE, gathered data on respondents' weight gain throughout the quarantine. Those with bad diets gained the most weight (Rajkumar, R. P., 2020). Given the short confinement period of COVID-19, the verified weight gain was not evaluated in this research; nonetheless, the large proportion of the population who reported an increase in weight may be regarded a proxy for changes in eating habits and activity level. So it's proposed that unfavorable changes in dietary actions are caused by worry or monotony (Razzak, H.A. et al., 2017), a lack of inspiration to maintain healthy practice (Barro, R. J., 2020), or a shortage of products and narrow Khulna City Corporation's overweight and obesity rates were high before COVID-19 and have subsequently risen. More than half of Khulna City Corporation's population, with females more afflicted, is obese (Sulaiman, N. et al., 2017). Obesity and associated risk factors must be minimized, especially during the COVID-19 pandemic.

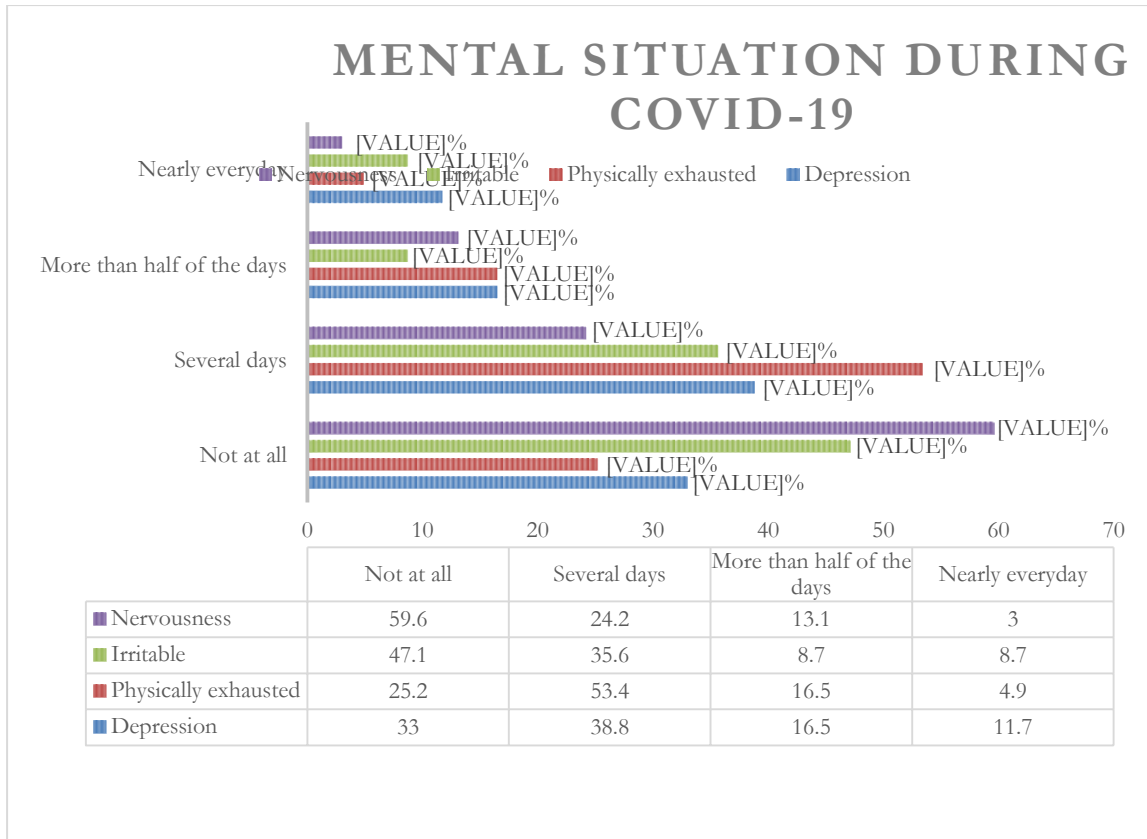


Figure 2. Mental situation during COVID-19 situation (n = 308).

Most survey respondents ate less than four servings of fruits and vegetables daily. In a recent study, just 28% of teens met daily fruit and vegetable guidelines (Bhutani, S., & Cooper, J. A. 2020). Fruits and vegetables are abundant in fiber, vitamins, minerals, and antioxidants. Antioxidant-rich diets, including the suggested diet and DASH, protect arteries. The usual anti-inflammatory diet consists of a high plant-based diet, minimal red meat and dairy intake, and moderate olive oil use (Deschasaux-Tanguy, M. et al., 2021). Following a nutritionist's diet improves health, reduces chronic sickness and inflammation, and boosts immunity (Todisco, P., & Donini, L. M., 2021). The suggested diet is nutritious, sustainable, and has less environmental impact than standard Western diets. Data shows that our country's suggested diet is favorable for chronic inflammatory conditions such type-2 diabetes, visceral obesity, and metabolic syndrome (Torales, J., 2020).

Given the high incidence of cardiovascular disease in Khulna City Corporation, it's important to promote nutritionist-recommended diets to minimize the negative impacts of quarantine on dietary habits and health. "Western-type diet" and "Free Sugars diet" evolved in the studied population due to the COVID-19 outbreak. These data indicate unhealthy diets during the outbreak. Previous study demonstrates a transition in Eastern Mediterranean diets from a typical Mediterranean diet to a more Westernized diet rich in caloric, cholesterol, salt, processed carbohydrates, and saturated fat but low in fruits, fibers, vegetables, and polyunsaturated fats (Ping Wu et al., n.d.). Khulna City Corporation's dietary habits may be advantageous against

Table 6. Lifestyle changes during COVID-19 situation by demographic factors (n = 308)

Variables	% (n)	Gender			Age group					Education level				P-value	
		Male % (n)	Female % (n)	P- value	18-35	36-45	46-60	Above 60	P- value	Less than high school	High school	College/Diplo ma	Bachelor's degree		Higher than bachelor's degree
Weight															
Lost weight	25.5 (79)	6.38 (20)	19.15 (59)	0.003	14.89 (46)	4.26 (13)	3.54 (11)	2.84 (9)	0.004	1.42 (4)	3.55 (11)	3.55 (11)	14.89 (46)	2.13 (7)	0.000
Gained weight	46.8 (144)	9.22 (28)	37.58 (116)		28.37 (87)	8.52 (26)	8.52 (26)	1.42 (4)		4.26 (13)	2.84 (9)	9.22 (28)	26.24 (81)	4.26 (13)	
Maintained weight	22.7 (70)	2.13 (7)	20.57 (63)		11.36 (35)	4.97 (15)	5.67 (17)	0.72 (2)		2.84 (9)	4.26 (13)	2.84 (9)	9.93 (31)	2.84 (9)	
Do not know	5.0 (15)	.71 (2)	4.26 (13)		3.55 (11)	0.0 (0)	0.71 (2)	0.71 (2)		0.0 (0)	1.42 (4)	0.0 (0)	3.55 (11)	0.0 (0)	
BMI Stage															
Under Weight		1.62 (5)	16.23 (50)	0.066	16.23 (50)	0 (0)	1.62 (5)	0 (0)	0.001	0 (0)	0.65 (2)	3.57 (11)	13.64 (42)	0 (0)	0.019
Normal		9.09 (28)	43.18 (133)		31.17 (96)	10.72 (33)	7.14 (22)	3.57 (11)		2.92 (9)	7.47 (23)	7.14 (22)	28.89 (89)	5.52 (17)	
Over Weight		5.52 (17)	15.59 (48)		5.52 (17)	4.22 (13)	8.77 (27)	2.27 (7)		3.57 (11)	2.93 (9)	2.93 (9)	8.77 (27)	2.93 (9)	
Obese		1.62 (5)	4.22 (13)		3.57 (11)	2.27 (7)	0 (0)	0 (0)		1.62 (5)	0.65 (2)	1.62 (5)	1.62 (5)	0.65 (2)	

Severely Obese	0.65 (2)	2.27 (7)	1.62 (5)	0.65 (2)	0.65 (2)	0 (0)	0.65 (2)	0 (0)	0.65 (2)	1.62 (5)	0 (0)				
Meals per day															
2	6.8 (21)	0.71 (2)	5.67 (17)	0.001	4.26(13)	1.42 (4)	0.71 (2)	0.0 (0)	0.000	0.0 (0)	0.0 (0)	1.42 (4)	3.55 (11)	1.42 (4)	0.002
3	77.4 (238)	14.18 (44)	58.87 (181)		37.59(116)	15.60(48)	15.60(48)	4.26 (13)	7.09 (22)	17.01(52)	10.64 (33)	36.88 (114)	7.09 (22)		
4	15.0 (46)	1.42 (4)	12.77 (39)		12.06(37)	0.71(2)	0.71 (2)	0.71 (2)	0.0 (0)	0.71 (2)	2.84 (9)	9.93 (31)	0.71 (2)		
>4	0.8 (2)	0.71 (2)	0.0 (0)		0.71 (2)	0.0(0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.71 (2)	0.0 (0)	0.0 (0)		
Physical activity															
No training	31.2 (96)	5.67 (17)	25.53 (79)	0.000	17.73(55)	2.84 (9)	8.51 (26)	2.13 (7)	0.000	2.84 (9)	4.26 (13)	5.67 (17)	16.31 (50)	2.13 (7)	0.000
45 min/ less	55.3 (170)	8.51 (26)	46.81 (144)		30.50(94)	12.77(39)	8.51 (26)	3.55 (11)	5.67 (17)	6.38 (20)	7.09 (22)	29.08 (90)	7.09 (22)		
45-60 min	9.9 (30)	2.84 (9)	7.09 (22)		7.80 (24)	0.71 (2)	1.42 (4)	0.0 (0)	0.0 (0)	0.71 (2)	2.13 (7)	7.09 (22)	0.0 (0)		
60-90 min	2.1 (6)	0.71 (2)	1.42 (4)		1.42 (4)	0.71 (2)	0.0 (0)	0.0 (0)	0.0 (0)	0.71 (2)	0.71 (2)	0.71 (2)	0.0 (0)		
90-120/ more	1.4 (4)	0.71 (2)	0.71 (2)		0.71 (2)	0.71 (2)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.42 (4)	0.0 (0)		
Screen time (entertainment)															
<2	29.1 (90)	4.97 (15)	24.11 (74)	0.001	13.48 (42)	4.97 (15)	8.51 (16)	2.13 (7)	0.002	2.13 (7)	2.13 (7)	5.67 (17)	14.18 (44)	4.96 (15)	0.002

2-3	25.5 (79)	4.97 (15)	20.57 (63)		14.18 (44)	5.67 (17)	4.97 (15)	0.71 (2)	1.42 (4)	2.84 (9)	4.96 (15)	12.77 (39)	3.55 (11)		
3-4	20.6 (63)	4.26 (13)	16.31 (50)		12.77 (39)	3.55 (11)	2.84 (9)	1.42 (4)	2.84 (9)	3.55 (11)	1.42 (4)	12.06 (37)	0.71 (2)		
5-6	9.2 (28)	2.13(7)	7.09 (22)		6.38 (20)	2.13 (7)	0.0 (0)	0.71 (2)	0.0 (0)	2.13 (7)	0.0 (0)	7.09 (22)	0.0 (0)		
>6	8.5 (26)	0.71 (2)	7.80 (24)		7.80 (24)	0.71 (2)	0.0 (0)	0.0 (0)	0.71 (2)	0.71 (2)	1.42 (4)	5.67 (17)	0.0 (0)		
Do not use	7.1 (2)	1.42 (4)	5.67 (17)		3.55(11)	0.71 (2)	2.13 (7)	0.71 (2)	1.42 (4)	0.71 (2)	2.13 (7)	2.84 (9)	0.0 (0)		
Sleep hour															
5-6	51.8 (160)	10.64 (33)	41.13 (127)	0.001	24.82 (76)	10.64 (33)	12.77 (39)	3.55 (11)	0.001	7.80 (24)	6.38 (20)	7.80 (24)	25.53 (79)	4.26 (13)	0.000
7-8	34.8 (107)	4.97 (15)	29.79 (92)		22.70(70)	4.97 (15)	5.67 (17)	1.42 (4)	0.71 (2)	3.55 (11)	6.38 (20)	19.15 (59)	4.96 (15)		
9-10	9.9 (30)	2.13 (7)	7.80 (24)		8.51 (26)	1.42 (4)	0.0 (0)	0.0 (0)	0.0 (0)	1.42 (4)	0.71 (2)	7.80 (24)	0.0 (0)		
>10	3.5 (11)	0.71 (2)	2.84 (9)		2.13 (7)	0.71 (2)	0.0 (0)	0.71 (2)	0.0 (0)	0.71 (2)	0.71 (2)	2.13 (7)	0.0 (0)		
Sleep disturbances															
Yes	56.0 (172)	7.09 (22)	48.94 (151)	0.046	34.04 (105)	7.09 (22)	12.06 (37)	2.84 (9)	0.007	7.09 (22)	7.80 (24)	8.51 (26)	29.08 (90)	3.55 (11)	0.019
No	44.0 (136)	11.35 (35)	32.63 (100)		24.11 74()	10.64 (33)	6.38 (20)	2.84 (9)	1.42 (4)	4.26 (13)	7.09 (22)	25.53 (79)	5.67 (17)		

COVID-19, which may impair the immune system and other health issues. It is unknown whether these eating habits were triggered by the COVID-19 outbreak lockdown, but the effects might be severe given that an adequate supply of macro- and micronutrients is essential for optimal immune response and function (Diez, J., 2019). Positive aspects of this study's passive improvements in eating behavior include an increase in home-cooked meals, breakfast intake, and decreased fast food consumption. Khulna City Corporation's face-to-face survey of 308 consumers found that most made their own meals and ate out less. During the coronavirus epidemic, more than half of those questioned exercised less than 45 minutes each day. Females in this research had a lower risk of increasing idleness than men.

The results of this questionnaire are consistent with past studies showing that COVID-19 has had a major influence on lifestyle patterns globally, including reduced sports and physical activity (Husain, W., & Ashkanani, F., 2020). According to the worldwide study "Effects of Home Confinement on Multiple Lifestyle Behaviors during the COVID-19 Outbreak (ECLB-COVID-19)," the COVID-19 pandemic lowered all degrees of physical activity (vigorous, walking, moderate, and total) and increased daily inactivity by roughly 28% (Echeverría, G. et al., 2020). In the same poll, 20.6% of people spent more than 3-4 hours each day using screens for entertainment. Reduced physical activity and a bad diet increase cardiovascular risk and weight gain during confinement. During these times, it's important to promote awareness about the benefits of regular exercise (WHO Coronavirus).

During the COVID-19 pandemic, it's also important to identify groups at risk of unhealthy lifestyles so interventions may be targeted to them. COVID-19 caused increased concern, tension, and melancholy. During the coronavirus pandemic, individuals reported increased tiredness, irritability, and stress. Sleep must be investigated more since it affects endocrine systems, obesity, and depression risk. More than two-thirds of survey participants used social media as their major source of health information, despite WHO instructions to restrict exposure to misleading news that may cause fear or upset. Studies show that misinformation overload "infodemic" harms people's mental health (Wilder-Smith A, 2019). Stress and anxiety may impair sleep and daytime vitality. During the outbreak, 16.3% more people reported poor sleep quality and 18.4% more reported sleep disturbance.

Xiao and his colleagues found a negative association between anxiety and sleep quality, indicating telepsychiatry might be a beneficial therapy strategy (Wu, P. et al., 2009). Telehealth is useful for patient support and mental health therapies (Xiao, H., 2020; Zachary, Z. et al. 2020; O'Connor, R. C., 2020). Following the standard advised diet reduces the risk of cardiovascular disease and several kinds of cancer, as well as mental discomfort, sleep quality, and self-perceived health status (Zhou, X., 2020). This study's shortcomings include the self-reported questionnaire, convenience sample, and cross-sectional design.

Mental discomfort, sleep disturbance, anxiety, changes in food habits, changes in weight etc. all are related to the nutritional consumption. Besides the mental situation is comparatively related to the dietary habits. Food consumption reflects the mind set and it's vice versa. A healthy lifestyle is completely depended on some factors. Among these factors, food habit and mental health situation is a very important for the determination of a person's lifestyle.

Conclusion

The study data was obtained after lockdown, thus no inferences can be made. Because most participants were women, gender-segregated findings should be viewed with care. Each person may refer up to three non-family members, and only one person from each age group (young adults, older people, and elderly) was registered from each residence to minimize convenience sampling bias (including inter correlated-similar individuals). Because meal frequency data were only obtained during the COVID-19 pandemic, the transition in dietary habit was not explored. However, they may be used as a reference for future research in similar uncertain conditions. This was done to prevent memory bias, since the respondents had been given too many questions about daily meal frequency and amount before COVID-19 lockout. The research didn't measure obesity, eating problems, or COVID-19 infection. Such a study would have needed a lengthier questionnaire, decreasing compliance and

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response rates, and a larger sample size depending on prevalence. The study's female participants were another difficulty. This is common in face-to-face surveys (Zhou, X. et al., 2020; Zachary, Z., et al., 2020; Wu, P., et al., 2009), but it should be considered when interpreting data. Face-to-face surveys made COVID-19 data collecting easier in all thanas. The participants' anonymity eliminated social desirability bias. The study's strength is that collecting data one month after lockdown reduces memory failure. The survey was provided in English so everyone could readily analyze the data, and the data collectors translated it into Bangla so respondents could better understand it. During the COVID-19 epidemic, Khulna City Corporation residents suffered undesirable lifestyle changes, nutritional imbalances, increased physical activity, and psychological difficulties. These results should be incorporated in future Khulna City Corporation laws to protect public health and limit viral spread.

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