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RESEARCH ARTICLE

Influence of the COVID-19 Lockdown on the Lifestyles and Eating Behavior of Cihan University Students

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ABSTRACT

Recent studies found that a city confinement as a result to COVID-19 outbreak resulted on eating and lifestyle behavior changes. This study investigated the influence of lockdown on eating and lifestyle changes. A cross-sectional study was done from December 18, 2021, to February 20, 2022. The research composed of three parts. Part I (six questions) contained sociodemographic statuses; section two (11 questions) studied dietary behavior through that included a Mediterranean diet (MD) adherence using 14-scaled items with an MD screener tool ranging from 0 to 13; and section three (12 questions) studying lifestyle habit changes such as physical activity, sleeping habits, and smoking habits. The results showed that 17% (63) of individuals that believed their lifestyle had improved, while 38.6% (143) stated that it had worsened. Specifically, during lockdown, the physical activity frequency seems reduced from 50% (185) to 33% (127), and sleeping hours for those sleeping more than 9 h were dramatically raised from 17% to 31.4%. In terms of eating habits, 36.8% of participants stated appetite improvement, whereas 22.7% reported a decrease. The appetite change during confinement was not connected with body mass index, although it was significantly associated with weight change ($P = 0.0001$). Similarly, 47% of participants said that they had gained weight. The data also showed that 67% (248) medium adhered to MD diet. Thus, the COVID-19 lockdown has negatively affected both lifestyle and eating behavior of the students.

Keywords: COVID-19, eating behavior, eating pattern, lifestyle, mediterranean diet

INTRODUCTION

The COVID-19 is a crucial respiratory disease due to the SARS coronavirus 2. The virus was discovered in transit from animals to people at the market of seafood Hunan-China in December 2019 and very quickly spread globally. The COVID-19's global expansion is a quickly changing condition. The Emergency Committee of World Health Organization's summoned a worldwide health emergency on January 2020, due to increased case reporting rates.^[1] The SARS-CoV-2 virus's emergence and spread created a global pandemic that led to serious pandemic and a large deaths number. Governments around the world responded to the pandemic by establishing a variety of measures to prevent the virus spread including home quarantine and travel restrictions.^[2]

In Kurdistan Region of Iraq, the confirmed infection with COVID-19 was 392,791 from March 1, 2020, to January 18, 2022. Therefore, at the beginning to stop the separation of pandemics, the ministry of health introduced a lockdown in March and April of 2020, and a limiting the community activity, parties, gatherings, meetings, and schools.^[3]

The city lockdown results in rapid and extreme changes in the habits and lives of the people and students, as well as a

noticeable reduction in social activities. Physical confinement and isolation had an enormous impact on community's lifestyles, especially their eating patterns and daily activities. Home staying works (which includes online schooling, working at home, and limiting outdoor and recreational activity) and saving food (due to shopping restrictions) are the two key impacts. In addition, the changing daily routine work resulted from the lockdown can cause boredom that can be associated with increased food consumption.^[4] A person can feel stressed from reading or hearing about the COVID-19 in the media on a daily basis, which can contribute

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to overeating, particularly “food desiring” comfort foods high in sugar.^[5]

Dietary behavior and changes are possible due to of the COVID-19 confinement. On the other hand, a healthy lifestyle and diet are supportive to the body well-being. For that purpose, a number of health organizations including the EFAD and WHO and proposed a number of nutritional and lifestyle guidelines to be practiced during confinement.^[6] Especially, Mediterranean diet was recommended as a healthy and immune booster diet style.^[7]

The main aim of the study included investigating and understanding and the changes of eating behavior including eating pattern, shopping behavior, and lifestyle behavior during the COVID-19 lockdown among the Cihan University students.

MATERIALS AND METHODS

Study Design

The research used a cross-sectional design to study Lifestyle Changes and Eating Behavior in COVID19 lockdown (LCEB-COVID-19) snowball survey sampling among Cihan University-Erbil students. The study was conducted from December 18, 2021, to February 20, 2022. The study was started by intervening students randomly from different department and sociodemographic backgrounds. There was no inclusion expert for being Cihan-University-Erbil.

Sample Size

A total of 370 undergraduate student of Cihan University-Erbil ($N = 5000$) was randomly selected from genders (applied and humanitarian fields). The size of the sample was finalized following the Yamane’s formulation considering 50% prevalence at the finite targeted population. $n = N/(1 + Ne^2) =$ approximately 370 where, $n =$ size of the targeted sample, $e =$ error of margin of 0.05, and $N =$ size of the population that is approximately accounted to 5000.

Study Questionnaire and Instruments

LCEB-COVID-19 questionnaire was first created by the previous studies (Di Renzo *et al.*, 2020) (Galali). A total of 43 questions were structured that divided into three parts.

- Part I: Sociodemographic data (five questions) such as age, gender, place of living and weight, and height.
- Part II: Dietary behavior part (11 questions: Including two parts: (a) Mediterranean diet (MD) adherence utilizing 13-scaled questions and using MD screener tool ranging from 0 to 13 and (b) set of questions food intake structured style: Intake of unhealthy foods; pastry products and packaged sweet, salted snacks, fizzy drinks, and sauces used for dressing on a daily basis.
- Part III: Lifestyle changes (12 questions): Sleeping behavior, smoking habit, physical activity, and shopping.

Ethical Consent

Ethical approval was not required by the university; however, consent of participating from the participants was taken.

Statistical Analysis

Statistical analysis was done to analyze data utilizing SPSS (Statistical Package for the Social Sciences v. 21.0, IBM). Chi-square test was done to compare variables of different categories. Statistically significant level was set at a level of $P < 0.05$.

RESULTS

Demography and Lifestyle

This questionnaire was launched in 18 - DES - 2021, and data collected were commenced after the confinement was attenuated after 2 months passed. The answer of the participants was analyzed statistically. The total number of participants was 370 as designed after validation of the data, and any missing data were excluded. The number of participants was (78.9%) 292 from Erbil city, (8.9%) 33 from Sulaimani city, (5.7%) 21 from Duhok city, (4.6%) 17 from Soran city, and (1.9%) 7 from Halabja city [Table 1]. Data of gender showed that (51.4%) 190 were male and (48.6%) 180 were female according. In relation to participants, body mass index (BMI); normal BMI 54% (198), underweight 8.4% (31), overweight 28% (99), and obese Type I was 7% (26), obese type II was 3.2% (12), and obese type III was 1% (4).

Participants aged from 18 to 25 years old represent the majority of the participant with 68.4% (253), following by participants who aged from 26 to 30 years old with 21.4% (79), following by participants who 31–35 years old with 5.9% (22), then participants who more than 35 years old with 4.3% (16). Regarding residency, 65.1% (241) stated that they live in cities and 34.9% (129) were from countryside areas.

Regarding the lifestyle changes, the data showed that the greater number of the students stated that their lifestyle had effected in some way. For instance, 17% (63) of participants reported that their lifestyle was getting better; on the other hand, 38.6% (143) stated that their lifestyle quality had deteriorated [Table 2].

The results also showed that the frequency of physical activity seems to be lowering and the students are less active. The percentage of students did not practice exercise before and during the outbreak was 50% and 67%, respectively. Furthermore, the weekly sessions of exercise training number were also significantly reduced [Table 4]. Smoking cigarettes were slightly changing but not significantly different ($P > 0.05$). Only people who smoked 5–10 cigarettes seem to be increasing and people who smoked more than 10 cigarettes decreased. Regarding sleeping hours, there are differences before and during COVID-19 pandemic lockdown. The percentage of people reporting sleeping < 7 h reduced from 36.5% to 30.5%. The percentage of students stated sleeping between 7 and 9 h per night reduced from 46.5% to 38.1% and those reporting more than 9 h sleep increased from 17% to 31.4% [Table 6].

The data also revealed the before the COVID-19, the most practiced exercise was running (11%), gym (25%), football (9%), basketball (3.5%), swimming (1%), volleyball (0.1%), and tennis (0.8%), respectively. On the other hand, functional training (25%), treadmill running (4.3%), weight lifting (2.5%), and using training tools (2.5%), respectively, were among the most practiced exercise during the pandemic [Table 3].

Table 1: Participants sociodemographic data

Characteristics	Total		Residency				
	No. (Percentage)	No. (Percentage)	Erbil	Sulaimani	Duhok	Halabja	Soran
			No. (Percentage)	No. (Percentage)	No. (Percentage)	No. (Percentage)	No. (Percentage)
Gender							
Male	190 (51.4%)	144 (39%)	20 (5.4%)	13 (3.5%)	4 (1%)	9 (2.5%)	
Female	180 (48.6%)	148 (40%)	13 (3.5%)	8 (2.1%)	3 (0.8%)	8 (2.1%)	
Age							
18–25	253 (68.4%)	205 (55.5%)	18 (4.9%)	14 (3.8%)	7 (1.9%)	9 (2.5%)	
26–30	79 (21.4%)	62 (16.8%)	9 (2.5%)	6 (1.7%)	0	2 (0.5%)	
31–35	22 (5.9%)	15 (4.1%)	3 (0.8%)	1 (0.1%)	0	3 (0.8%)	
Older than 35	16 (4.3%)	10 (2.7%)	3 (0.8%)	0	0	3 (0.8%)	
BMI							
Underweight	31 (8.4%)	27 (7.3%)	1 (0.1%)	2 (0.5%)	1 (0.1%)	0	
Normal weight	198 (54%)	153 (41.4%)	23 (6.2%)	10 (2.7%)	2 (1%)	10 (2.7%)	
Overweight	99 (28%)	82 (24%)	5 (1.4%)	8 (2.1%)	1 (0.1%)	3 (0.8%)	
Obesity 1	26 (7%)	17 (5%)	4 (1%)	1 (0.1%)	1 (0.1%)	3 (0.8%)	
Obesity 2	12 (3.2%)	10 (2.7%)	0	0	2 (0.5%)	0	
Obesity 3	4 (1%)	3 (0.8%)	0	0	0	1 (0.1%)	

BMI: Body mass index

Table 2: Perception of participants about lifestyle changes during COVID-19

Perception	Frequency	%
No changes	164	44.3
Yes, for worse	143	38.6
Yes, for better	63	17.0
Total	370	100.0

Table 3: Exercise types practiced during and before COVID-19 confinement

Types of exercise	Before		Types of exercise	After	
	No.	%		No.	%
No exercise	185	50	No exercise	243	67
Running	40	11	Functional training	93	25
Gym	91	25	Treadmill	16	4.3
Food boll	33	9	Weight lifting	9	2.5
Swimming	4	1	Using training tools	9	2.5
Volley ball	1	0.1			
Tennis	3	0.8			
Basketball	13	3.5			

The data also showed that smoking behavior seems to slightly changing ($P > 0.05$). Only people who smoked 5–10 cigarettes seem to be increasing and people who smoked more than 10 cigarettes decreased [Table 5]. Regarding sleeping hours, there are differences in relation to COVID-19 confinement. The students' percentage reporting sleeping

Table 4: Physical activity and exercise frequency before and during lockdown

Frequency	Before		During	
	Number	%	Number	%
Nothing	185	50	243	65.6
1–2 times	87	24	90	24.3
3–5 times	52	14	22	5.9
More than 5	46	12	15	4

Table 5: Smoking frequency before and after lockdown

Smoking frequency	Before		During	
	Frequency	%	Frequency	%
No	248	67	248	67.0
<5 cigarettes	40	10.8	38	10.3
5–10 cigarettes	26	7.0	29	7.8
>10 cigarettes	56	15.1	55	14.9
Total	370	100	370	100.0

<7 h reduced from 36.5% to 30.5%. Furthermore, the students' percentage confirmed sleeping hours between 7 and 9 h reduced from 46.5% to 38.1% and those exceeding 9 h sleep raised from 17% to 31.4% [Table 6].

Eating Habits

Eating habits also seems to be effected by the confinement, the students percentage stated an appetite change during COVID-19 confinement revealed that 37% (136) of the

students thought appetite improved, however, 23% (84) reported opposite and 40% (150) stated no change appetite [Table 7]. According the data [Table 8], it can be seen that the percentage of students who put on weight is 36% (133) or gained a lot of weight was 17% (17) whereas 19% (70) of the students thought that they lost weight and 40% (150) was felt no change in weight. The results also showed that the percentage of the students feeling hunger before the main meals was 47.8 % (177), between main meals was 26% (97), and hunger post dinner was 27% (100).

Food consumption behavior was also researched before and during the pandemic. The data showed that delivered pizza, vegetables, fruit, cereals, homemade pizza, and wine increased. Whereas, consumption of hot beverage, delivered pizza, wine and beer, processed meat, snack, and homemade pizza decreased. The data of place of purchase revealed that percentage of students buy food products in supermarkets by 75% (276), grocery 10.2% (38), and local products 12% (44). Despite significant decrease in food supply chain of organic and local products in Kurdistan, but still 3.2% of participants purchase organic foods from locals, this might be attributed to safety and health reasons [Figure 1].

Data analysis of the participants showed that there is no relationship between BMI and appetite change ($P < 0.05$). BMI was also associated with meal number change. For instance, 25.8% of underweight, 19.7% of normal, 12.1% over, and 23.8% of obese participants seem to have more meals during the pandemic. Furthermore, the data analysis also showed that there is a significant association between weight change and

appetite change ($P < 0.0001$), but age had no relationship with weight change ($P > 0.05$). Furthermore, 47% of the participants who thought their weight increased it seem that their appetite was also increased. The data analysis also showed that weight change is significantly different among gender groups ($P < 0.05$). Furthermore, 41% of the males and 29% of the females think that their weight has increased [Table 8].

MD Adherence Screener Tool

The MD adherence screener tool was used to determine the adherence level to MD. According to their adherence level, the participants were categorized into three groups: High, low, and medium adherence. Furthermore, it can be seen that the greater number of the participants is medium adhered to 248 (67%) [Table 9]. Consumption of the foods that have the highest level of adherence included delivery pizza, vegetables, fruit, nuts, cereals, home pizza, wine, dairy products, vegetable juice, and eggs, respectively. According to data, the students seem medium adhered to MD fruits and vegetables are particularly highly consumed [Figure 1].

DISCUSSION

This study has been done after the COVID-19 lockdown in the Cihan University, Erbil, Iraq, alongside the studies^[3] in Kurdistan region, Iraq, and Spain (Rodríguez-Pérez *et al.*, 2020). The insight of weight increase might be connected with the fact that individuals are less physically active are more sedentary and consume extra frequent meals and/or snacks.^[8]

Many governments implemented safety precautions to flatten positive cases during the early emergency stages of the COVID-19 outbreak, including as quarantine and isolation. Despite the fact that these protective measures reduced the percentage of cases, along with media coverage of incidence and mortality, as well as employment losses and restrictions on persons' freedom had a negative impact on psychology, eating behavior, and lifestyle of people and the public. This might be of particular interest when health professionals advise maintaining a positive mental attitude and eating a well-balanced diet to boost the immune system and lower the chance of viral infection, such as COVID-19.^[9] This is extremely critical when no approved protective or therapeutic drug is registered, and the community should advise caution and maintain a healthy lifestyle and diet.

The results revealed that percentage of students who exercised during COVID-19 was declining. Similarly, due to confinement, the total hours of sleeping are increased. These might address that outbreaks made the students less active particularly and more sedentary outdoors activities. However, there are still students who can create chances to practice exercise at home, especially functional such as treadmill and training. Whereas, the percentage who students who smoked between 5 and 10 seem to be increased by 1%. This could explain raising stress and quarantine upset.

The data also discovered that almost more than half of students had weight gain perception. This might be linked to an increase in hunger and the introduction of a meal or a snack during confinement, since roughly identical percentages of individuals stated that their appetite and snacks or meals

Table 6: The sleeping hours before and during lockdown

Frequency	Before		During	
	Frequency	Percent	Frequency	Percent
<7 h	135	36.5	113	30.5
7–9 h	172	46.5	141	38.1
More than 9 h	63	17.0	116	31.4
Total	370	100.0	370	100.0

Table 7: Perception of appetite changes among the participants during COVID-19 lockdown

Perception	Appetite changes	
	No.	Percentage
Not changed	150	40.5
Reduced	84	22.7
Increased	136	36.8

Table 8: Perception of weight changes among the participants during COVID-19 lockdown

Weight changes	No.	Percentage
No change	70	19
Reduced	84	22.7
Increased	133	36
Significantly increased	1	17

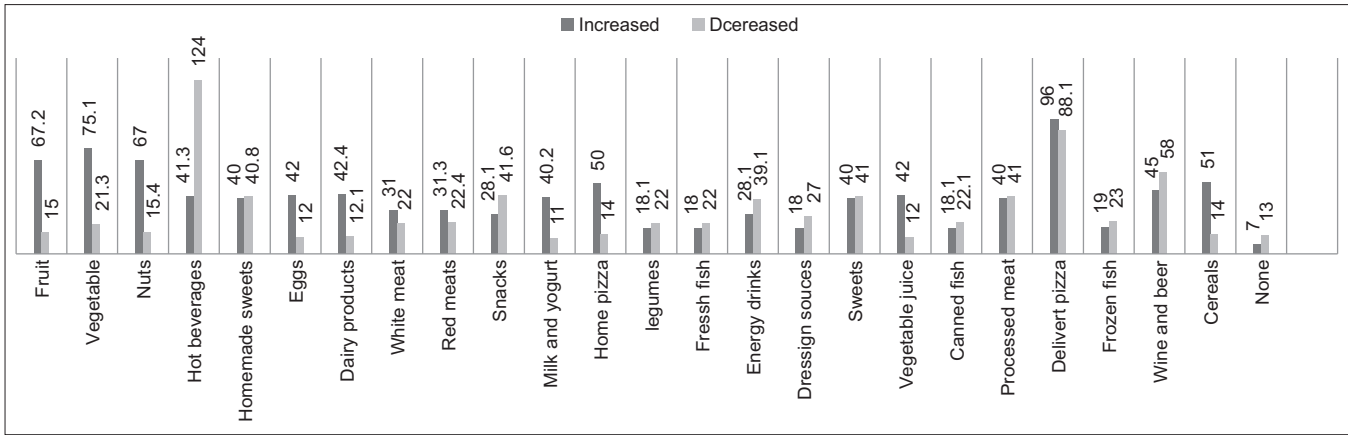


Figure 1: Food consumption behavior during COVID-19

Table 9: The consumption of MD components and adherence to MD

MD components	Recommended servings (day or week)	Number	Percentage
Vegetables	Two or more s/day	198	53.5
Fruits	Three or more/day	270	73.0
Olive oil	Main dressing	75	20.3
Olive oil	Four or more s/day	75	20.3
Read meat	Less than 1 s/day	281	75.9
Butter	Less than 1 s/day	83	22.4
Legumes	Three or more/week	212	57.3
Fish and seafood	Three or more s/week	135	36.5
Sweet beverage	Less than 1/day	238	64.3
Sweets	Less than/week	267	72.2
Nuts	Three or more/week	258	69.7
White meat over red	Weekly	311	84.1
Pasta, vegetable, or rice dishes flavored with garlic, tomato, leek, or onion		214	57.8
Adherence to MD*		Number	Percentage
High		76	21
Medium		248	67
Low		46	12

*Adherence to MD high; of more than 9 components consumed, medium if 5–9 components is consumed, and low if <5 components consumed

number increased during lockdown. A recent study discovered that the impression of weight increase is linked to changes in hunger and the addition of additional meals.^[10]

People who are more sedentary and less physically active, as well as those who consume more often meals and/or snacks, may perceive weight increase.^[8] Increasing weight, or the thought of gaining weight, may have a negative impact on an individual’s physiology, psychological well-being, and immune system. Obese people are more likely to get COVID-19 virus infections, according to recent research and stress and anxiety.^[11] As a result, it is worth noting that, in addition to remaining healthful, the psychological dimension of this epidemic is equally vital and useful in better managing it.

Home-cooked food and only-delivered-pizza consumption appear to be increasing, and individuals are spending

more time cooking their own meals, according to the data. Furthermore, some people’s unhealthy eating and junk food intake increased significantly after being quarantined. It was to be expected, considering how limited access to fruits and vegetables is under lockdown. Kurdistan, in particular, is an area where the vast majority of vegetables and fruits are imported from outside, and the restriction of borders with surrounding countries has made it impossible to obtain. This could have a negative impact on the intake of immune boosting nutrients and general health.

However, the Mediterranean diet was modestly adhered upon by the majority of the participants as healthy and suggested diet for COVID-19. Because we have better access to these things before the quarantine, this number may be substantially higher. Getting adequate healthy foods improves your health condition and helps you fight infections from

viruses (Silverio *et al.*, 2020). As a result, the enough amount and diet types, such as the MD, can give enough immune-boosting micronutrients, such as minerals and vitamins, to reduce the virus pathogenicity.

CONCLUSION

The aim of this research was to see how COVID-19 lockdown affects Cihan University students' food habits and lifestyle modifications. The findings revealed that 38.6% of participants stated that the lockout had a negative influence on their lifestyle. COVID-19 has the potential to make the students less active than it was before to the confinement. COVID-19's eating habits appear to have deteriorated as well. Extra meals or snacks and appetite were given. As a result, many of the individuals believe that they have gained weight.

On the other hand, the participants appear to be moderately committed to the Mediterranean diet, with a high consumption of vegetables and fruits. As a result, a well-balanced diet combined with a more active lifestyle can help to maintain the immune system during pandemics such as COVID-19.

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CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

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