Libyan Journal of Public Health Practices (LJPHP)

Journal homepage:

https://journals.uob.edu.ly/LJPHP/index

Changes in Lifestyle and Eating Habits of the Libyan Population During the COVID-19 Pandemic

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ARTICLE INFO

Article history:
Received 1/6/2024
Revised 10/6/2024
Accepted 24/6/2024

Keywords:
COVID-19
Eating habits
Physical activity
Meal consumption
Life style changes

ABSTRACT

The corona virus pandemic has had a massive impact on people globally. Due to national lockdowns and social distancing people all over the world have developed irregular lifestyles. The current study aimed to assess the lifestyle and eating habit changes of population during the COVID-19 pandemic. A cross-sectional study was conducted by random sampling (N =940) on the general population of the Libyan population during the period from February 9th, 2021 until March 15th, 2021. A questionnaire was used to assess the changes of lifestyle and eating habits during COVID-19, which later identified by analysis using the SPSS program. The majority of the respondents 81% were not infected with the corona virus, and less than half of them, 39% followed all the recommended procedures. To lower the risk of being infected there was an increase in supplement use among female participants in comparison to male participants (85% of female vs. 15%, male p.value =0.000). This study also indicated that most of participants had a sedentary life style and changes in eating habits. These changes were seen more among participants infected with corona virus than others who were not infected (51% vs. 45%, p=0.000). The current study concluded that there were changes in participants' life style during the COVID-19 pandemic; the majority of the participants had a sedentary lifestyle, and increase in their body weight and in meal consumption- especially during the evening Education programs should be conducted to promote healthy lifestyle and healthy eating to combat infections such as COVID-19.

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1. Introduction

The coronavirus disease of 2019 is referred to as COVID-19, or Corona Virus. (1) The corona virus was first identified in Wuhan, China in December 2019, and due to its high contagiousness, it rapidly spread around the globe. (2) On January 31, 2020, the World Health Organization (WHO) designated COVID-19 as a public health emergency of global concern. A day later, on March 11, 2020, the WHO classified this epidemiological occurrence as a pandemic. (3,4) The WHO released a situation report on July 29, 2022, stating that there have been more over 579 million confirmed cases worldwide, with roughly 505,450 of those cases occurring in Libya. (5)

Although these limitations were implemented to decrease the spread of the COVID-19 virus, they also had a negative impact on mental and physical health in many nations and were found to have changed people's behavior, especially with regard to food habits. (10–13) Many studies have shown that when in stressful situations people tend to binge- resorting to unhealthy foods also known as "comfort food" - which are highly processed, sugar filled items that can have a deteriorating effect on health in the long term. (14, 15) In addition, due to the closure of gyms and the implementation of curfew, most people were forced to decrease their physical activity and have sedentary life style. (13–15) The impaired nutritional habits combined with decline levels of physical activity- could lead to a positive energy balance that may lead to weight gain and obesity. (16-19) Number previous studies reported that participants saw an increase in their meal number and frequency during lockdown. (20-22) In a study based in the Middle East and North Africa a total of 2970 participants were questioned. The percentage of participants consuming five or more meals per day increased from (2.2%) before the pandemic to (6.2%) during the pandemic. Moreover, the percentage of participants skipping meals decreased from (64.4%) before the pandemic to (45.1%) during the pandemic. When asked why they skipped meals, (60.8%) stated that not having enough time was the main reason before the pandemic and (37.9%) stated that loss of appetite was the main reason for skipping meals during the pandemic Although the results showed an increase in meal frequency, (74.0%) of participants reported not meeting the recommended water intake; drinking less than eight cups of water per day during the pandemic (12).

Due to the effect of the restriction on eating habits and behavior, the World Health Organization (WHO) released a list of nutritional recommendations that may enhance human immunity and decrease the complication of the disease. These recommendation suggested people should be follow a healthy diet that includes a variety of foods from each food group to ensure they are getting enough vitamins, minerals, dietary fiber, and protein, it also suggested people should limit sugar, fat, and salt intake. (23–29) Although these may not prevent people from getting COVID, they do help build a stronger immune system and lower the risk of chronic illness and severe complications.

There are limited studies that investigate the eating habits of people during the COVID-19 pandemic in Libya, and no study that has been undertaken in Benghazi, Libya, which explores the impact of COVID-19 on people's lifestyle and dietary patterns. Therefore, it has been suggested that the increase in home confinement and the psychological effect of the pandemic have induced changes in the lifestyle and eating patterns of individuals in Libya. The main aims of this study were to investigate the lifestyle and eating habit changes of participants during the COVID-19 pandemic and to determine the demographic variation in eating habits and lifestyle among the participants in Libya.

2. Methodology

2.1. Study population: A cross-sectional study was conducted by random sampling (N =940) on the general population of the Libyan population during the period from February 9th, 2021 until March 15th, 2021. The respondents were recruited to take part in this study either by

filling a questionnaire using Google form via online platform, or by the distribution of hard copies of the questionnaires to people in public spaces that include malls and schools with restricted by the safety procedures. The total number of participants who agreed to complete the questionnaire was N=940 (N=850 completed electronic questionnaire, and N=90 completed the hard copy.

2.2. Questionnaire: The study's questionnaire consisted of 38 questions separated into five sections. The first section covered demographics and personal information about the participants, such as city of residence, age, gender, educational level, occupation, income, and the number of family members. The second section of the questionnaire inquired about the medical history of the participants. The third section asked question about the changes in people's lifestyles during the COVID-19 pandemic. The fourth section asked questions regarding the changes in eating habits that occurred during COVID-19. The last section contained food frequency questionnaire. To reach the largest number of participants the questionnaire was distributed by two methods, in person and online through social media platforms such as twitter and facebook.

2.3. Statistical Analysis*:* The data was analyzed using SPSS version 21.0, the Statistical Package for the Social Sciences. In order to compare data, descriptive statistical tests such as frequencies, correlation tests, and Chi square tests with 95% confidence intervals were performed. Chi square analysis was employed to examine the relationship between different sociodemographic. variables and the percentage of individuals who took supplements and/or herbs on a daily basis. In addition, the association between changes of life style, eating habits among participants and socio-demographic factors were tested using Chi square analysis. Correlation test was used to compare usual weight and current weight of participants. All p values <0.05 were considered statistically significant.

2.4. Ethical Statement: This study was approved by the University of Benghazi. All surveys were anonymous and unidentifiable to maintain the confidentiality of the data collected.

3. Results

3.1Demographical characteristics of participants:

The questionnaire was completed by 940 participants; the majority of them 676(72%) were form Benghazi and (28%) from outside Benghazi including (Tripoli n=173, Misruta n=19, Albayda n=15, Almarj n=6, Sirt n=7, Kufrah n=11, Tobruk n=10, Zawra n=9, Hon n=10, Ajdabia =4). The majority of the surveyed individuals were female (78%) and the most distributed age was 20-35 (62%). Around half of the participants were single (56%), and the majority of them (85%) had university degree or higher level of education. There was a variation in jobs of the participants, (28%), (17%), and (12%) of them were students, teacher, and doctor respectively, while (10%) of participants were housewife and (6%) did not have any job. More than half of the respondents stated that their income was very good, and they had more than five members in their family, (58%) and (57%) respectively **(Table1).**

Table 2 shows that the majority of participants (81%) were not infected by corona, while (19%) of them were infected by the corona virus. More than half of the participants (66%) had a family member infected by the corona virus. Most of the surveyed individuals (78%) reported following safety measurements during the COVID-19 pandemic. The majority of the respondents did not have any other disease and only small percentage of them reported having hearth problems those include (7%) hypertension (2%) heart disease (5%) diabetes and (8%) respiratory diseases. The majority of respondents (61%) reported using supplements during the pandemic, and half of the respondents (50%) reported using herbs during the pandemic. Female and participants of high level of education consumed more supplements than males and participants with low education levels (15% males vs. 85% females, p=0.000; 12% primary and secondary level vs. 88% university and above level, respectively)

Table 1: The Distribution of Demographical Characteristics of Participants

Characteristics	Frequency	Percentage
Gender		
Female	738	**78%**
Male	202	22%
Age		
<20	73	8%
20-35	584	**62%**
36-50	204	22%
51-65	63	7%
>65	12	1%
Location		
Benghazi	680	**72%**
Outside of Benghazi	260	28%
Education level		
Primary level	23	3%
	113	12%
Secondary level	795	**85%**
University and above		
Social Status		
Single	529	**56%**
Married	370	40%
Divorced	24	3%
Widowed	12	1%
Occupation		
Student	267	**28%**
Teacher	169	**17%**
Doctor	108	12%
Engineer	65	7%
Housewife	90	10%
Government	78	8%
Employed	117	12%
Other	55	6%
Don't have		
Income		
Good	240	27%
Very good	519	**58%**
Excellent	133	15%
Number of Family Members		
≤5	396	43%
>5	518	57%

3.2Medical history of participants

Table 2: Medical history of participants:

Medical History	N	%
Corona infection:		
Yes	197	19%
No	753	**81%**
Family corona infection:		
Yes	317	**66%**
No	611	34%
Following safety procedures:	727	**78%**
Yes	205	22%
No		
Hypertension		
Yes	65	7%
No	814	**93%**
Heart disease		
Yes	17	2%
No	847	**98%**
Diabetes		
Yes	43	5%
No	829	**95%**
Respiratory disease		
Yes	69	8%
No	809	**92%**
Supplements intake:		
Yes	552	**61%**
No	359	39%
Herbs use:		
Yes	454	**50%**
No	454	50%

3.3Participants' Life style changes during corona:

When are asked the participants to describe the changes in their lifestyles during corona, approximately half of respondents 49% reported that they did not change in lifestyle and only 36% of them followed healthy life style. Nearly half of participants (43%) also state that they had changes in their health status and (58%) of them did not change the exercise level and only 16% had an increase exercise. Nearly half of the participants (47%) reported an increase in sleeping hours, and the majority sleeping hours were from 6-8 hours daily (49%). The same percentage of the surveyed individuals (54%) spent more than four hours on the television, and

they reported an increase in their weight during the pandemic (54%). **In table 3** there was significant relation between the changes of sleeping hours and participants who are infected with corona. Patients with Covid 19 had changes in their health status and increase sleeping hours. (57% vs 40%, p=0.000 and 61% vs 43% p=0.000) than uninfected participants.

Table 3: participants' life style changes during the pandemic of corona

	N	%
life style changes:		
Yes, became healthy	325	**36%**
Yes, became unhealthy	131	15%
Did not change	443	**49%**
Health status changes:		
Yes	388	43%
No	508	**57%**
Exercise changes:		
Yes, increase exercise	128	**16%**
Yes, decrease exercise	210	26%
Did not change	477	**58%**
sleeping hours changes:		
Yes, increase in sleeping hours	425	**47%**
Yes, decrease in sleeping hours	131	14%
Did not change	357	39%
Hours of sleeping		
Less than 6 hours	119	13%
6-8 Hours	442	**49%**
More than 8 Hours	348	38%
Hours of watching TV:		
0-2	173	19%
2-4	243	27%
>4	494	**54%**
Weight changes		
Increase in weight	493	**54%**
Decrease in weight	134	15%
Weight stayed the same	284	31%

3.4Food habits and food consumption among participants during the pandemic of corona virus:

Table 4 shows that around half of participants (46%) reported an increase in meal consumptions, 62% of them consumed less than three meals per day and 40 % of them consumed two snacks per day. The most meal neglected among participants was breakfast (44%), and the most type of snack consumption were chocolate and pastries, 50% and 24%. More than half of respondents state that their meal consumption was increased at night and in the evening, 52% 54%, respectively.

Table 4: Food habits and food consumption among participants during corona pandemic

	N	%
Meal consumption changes:	423	**46%**
Increase	135	15%
Decrease	358	39%
Did not change		
Number of meal consumption		
1-3	569	**62%**
3-6	334	36%
More than 6	16	2%
Number of snack consumption		
One snack	310	34%
Two snacks	363	**40%**
Three snacks	166	18%
More than three snacks	69	8%
Type of snack consumption		
Sweets	78	9%
Chocolate	424	**50%**
Pasta	204	**24%**
Nuts	97	12%
Others	43	5%
Neglected meals		
Breakfast	401	**44%**
Lunch	72	8%
Dinner	188	21%
Snacks	176	19%
Did not skip any meal	75	8%
Consumption increased:		
In the morning		
Yes	116	17%
No	551	**83%**
In the afternoon		
Yes	171	26%
No	492	**74%**
In the evening		
Yes	410	**54%**
No	350	46%
At night		
Yes	396	**52%**
No	364	48%

During the pandemic, there was variation in types of food consumption. Approximately near to half of participant had an increase consumption of fruit and vegetable, tea and coffee and starchy food, 46%, 42% and 32% respectively. Whereas 30% of the participants had decease fast food consumption and 67%, 70% of them reported that they did not change meat and restaurants food consumption **Table 5.**

4. Discussion:

This study indicates that there were no changes in participants' lifestyle during the pandemic of COVID-19. That means the level of physical activity was already low before the pandemic, therefore the pandemic had no effect on their sedentary life style. The present study's results are inconsistent with the findings from previous studies, which found that working from home, limitations on exercising, and gym closures during the COVID-19 pandemic were the main causes of the decline in physical activity levels (12, 30- 32).

The findings of this study revealed that more than half of the participants spent more than four hours watching television, similar to previous studies (31-36) which reported an increase of screen times in all age groups. This might be because participants were spending more time at home or the feeling of emptiness

Table 5- Changes in type of food consumption during COVID-19

	N	%
Change in Meat Consumption		
Increase consumption	145	17
Decrease consumption	144	16
Did not change consumption	587	**67**
Change in Fruit and Vegetable consumption		
Increase in consumption	406	**46**
Decrease in consumption	88	10
No change in consumption	357	44
Change in Tea and Coffee Consumption		
Increase in consumption	373	**42**
Decrease in consumption	119	14
No change in consumption	389	44
Changes in Fast Food Consumption		
Increase in consumption	246	29
Decrease in consumption	262	**30**
No change in consumption	357	41
Change in Starchy Food Consumption		
Increase in consumption	281	**32**
Decrease in consumption	154	18
No change in consumption	429	50
Increase in Consumption of Restaurant Food		
Increase in consumption	267	30
No change in consumption	639	**70**

that occurred during the corona pandemic- which lead to people trying to find comfort through television. Other studies indicated that the sleep quality decreased and the participants were suffering from insomnia during the pandemic. (37,38) In the previous study nearly half of participants showed an increase in sleeping hours (6-8 hours daily).(37) The findings of this study are similar with previous data obtained from China which confirmed total sleep time increased but sleep efficiency decreased. (34) Although the quality of sleep is not examined in this study, data from another Libyan study found that one-third of the Libyan population was suffering from clinical insomnia

during the pandemic, and there were changes in time and pattern of sleeping. (39)

Table 5: The association between changes in sleeping hours , meal consumption and socio-demographicalf

Variables	Changes in sleeping hours	p.value	Changes meal consumption	p. value
Sex: # **Male** **Female**	77(18%) **346(82%)**	P=0.020#	71(17%) **350(83%)**	P=0.006#
Age: # **<20** **20-35** **36-50** **> 50**	44(10%) **305(72%)** 57(13%) 19(5%)	P=0.000#	35 (8%) 298(71%) 71(17%) 18(4%)	P=0.000#
Education level: **Primary and Secondary** **University and above**	10 (2%) 414 (98%)	P=0.98	9 (2%) 410 (98%)	P=0.52
Social status: # **Single** **Married** **Divorced** **Widowed**	**289(68.4%)** 129(30.4%) 3(0.7%) 2(0.5%)	P=0.000#	**261(62%)** 150(36%) 7(1.3%) 3(0.7%)	P=0.014#
Income: **Good** **Very good** **Excellent**	111(28%) 230(58%) 57(14%)	P=0.94	113(28%) 229(57%) 57(14%)	P=0.913

significant association p. value <0.05 by chi-square test

This study results found that an approximately half of the participants reported an increase in meal consumptions similar to previous studies which showed an increase in meal number and frequency. (18, 33). This could be due to sitting at home, feeling afraid and stressed which could lead participant to overeat. Data from different international countries concluded that home confinement due to COVID-19 pandemic lead to an adverse effect on mental well-being and emotional state. These effects were associated with unhealthy lifestyle behaviours including unhealthy eating habits (18).

Regarding eating habit, this study indicates that most of the participants had unhealthy eating habits which included an increase in consumption of meals in the evening and at night. These results were confirmed by earlier worldwide studies (18,30,40-42) that demonstrated an increase in meal consumption and overeating among participants due to restrictions and stressful feelings. Although there is an increase in consumption of meals, this study found that most participants neglected breakfast. This could be due to disturbed quality of sleep and loss of appetite- this was confirmed by outcomes in a previous study (17). This study also found most

participants consumed unhealthy snacks such as chocolate and pasta. Similar results came from other studies that indicated psychological distress due to the pandemic of COVID-19 was associated with emotional eating and a higher consumption of unhealthy snacks that include beverages, sweets, high-sugar foods, and salty foods (12,43). In contrast, a Turkish study found a decrease in consumption of some foods such as chips, biscuits, chocolates, and frozen foods (44).

5. **Conclusion:**

The current study concluded that there were changes in participants' life style during the COVID-19 pandemic; the majority of the participants had a sedentary lifestyle. More than fifty percent of the participants did not participate in any physical activity, and reported an increase in sleeping hours. The major change among participants was an increase in body weight and an increase in meal consumption-especially during the evening. These changes were seen more among participants who were infected with the corona virus. In addition, there was an increase in consumption of supplementation and herbs; females consumed more supplements and herbs when compared to males.

Recommendations

1. Further longitudinal studies should be conducted to address these changes.
2. Establishing awareness programs aimed to promote healthy eating and ways to boost immunity to combat infections such as COVID-19.
3. Education programs should be carried out to educate people on supplements intakes and the benefits of them reducing the severity of COVID-19.

Acknowledgments:

We gratefully acknowledged all volunteers who participated in this study, as well as my colleagues for assistance in completing this study.

Conflict of interest:

Authors have declared that no conflict of interest

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