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ORIGINAL ARTICLE

Assessment of Impact of Covid-19 Virus on the Obesity and Depression on Patient's at Saudi Arabia in Makkah Al-Mukarramah in 2020

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ABSTRACT

Background: The COVID-19 pandemic had a significant impact on daily activities due to restrictions in terms of social distancing because of the elevated rate of contagion and mortality. Many sectors have been affected, worldwide. The world health organization (WHO) declared COVID-19 a worldwide pandemic on 11th March 2020. COVID-19 also referred to as coronavirus disease 2019 is a rising respiratory disease that is caused by a novel coronavirus which was initially detected in December 2019 in Wuhan, China, the disease is extremely infectious and therefore the outbreak has been declared a worldwide pandemic by the WHO. Obesity and overweight are well known risk factors for (COVID-19)disease , and are expected to be increasing in the Kingdom of Saudi Arabia particularly among females. There is a high frequency of increased BMI in patients admitted to intensive care for SARS-CoV-2 infection with a major severity in patients with an excess of visceral adiposity. Patients at risk of severe SARS-CoV-2 acute respiratory syndrome are characterized by the high prevalence of pre-existing diseases (high blood pressure and cardiovascular disease, diabetes, chronic respiratory disease, or cancer), most of them typically present in severely obese patients. Coronavirus illness 2019 (COVID-19) has quickly spread around the world, constraining nations to apply lockdowns and severe social separating measures

This study aimed: To assess the impact of COVID-19 virus on the obesity and depression patient's attendants in primary health care center in Makkah Al-Mukarramah.

Methods: cross-sectional study was conducted online among Saudi Arabia adults in primary health care center in Makkah Al-Mukarramah. A self-administered questionnaire was designed and has been send to the study participants through social media platforms and email. Our total participants were(300)

Results: the majority (43.0%) of the Individuals reported changes in mealtime during the COVID-19 to severe food follow by moderate food were(30.0%), also individuals reporting changes in the daily number of meals consumed during the COVID-19 to moderate food were(31.0%) follow by severe food were (18.0%).

Conclusion: results here showed the COVID-19 pandemic is having a significant impact on patients with obesity regardless of infection status. physical inactivity may be a factor that leads to an increase in obesity during Covid-19 Pandemic, the pandemic is having a significant impact on those without infections also .

Keywords: effect, obesity, population, Saudi Arabia, Covid-19, primary health care center

INTRODUCTION

The prevalence of obesity has been increasing in most countries over the past five decades (1), rendering this a global phenomenon and a major public health concern. As per the WHO report, over 1.9 billion are overweight, and 650 million individuals are obese (2). The recent World Health Survey in Saudi Arabia (KSAWHS) indicated that the prevalence of overweight and obesity in 2019 was 38 and 20%, respectively, in the Kingdom. (3)

Obesity is major public health problem among the Population in Saudi Arabia. obesity are very prevalent and associated with numerous health complications. eating is defined as the tendency to overeat as a coping mechanism for regulating and reducing negative emotions, during the (COVID-19) pandemic eating is increased prevalent among women and is associated with obesity The coronavirus 2019 (COVID-19) pandemic and mandatory quarantine increased, emotional eating (EE).(4)

As a result of the COVID-19 pandemic, many lifestyle habits may be unintentionally affected by lockdowns and “stay-at-home” instructions. Some important but undesirable consequences of staying at home may include weight gain, physical inactivity, and social isolation (5)(11). The former is of particular concern, given that weight gain during adulthood is associated with a higher risk of chronic diseases (6)

Coronavirus disease 2019 (COVID-19) has rapidly spread globally, forcing countries to apply lockdowns and strict social distancing measures. The outbreak of the 2019 novel coronavirus disease (COVID-19) was first reported in late December 2019 solely in the city of Wuhan, China(7)[2]. Despite strategies adopted by the Chinese government to stop the infection, it continued to spread throughout the world. By the end of January 2020, WHO declared COVID-19 as a public health emergency of international concern(8) and on 11 March 2020, WHO characterized this epidemiological phenomenon as a global pandemic(9). According to the situation report published by the WHO on 5 July 2020, there were over11 million confirmed cases globally and about 1•1 million cases in the Eastern Mediterranean Region(10). In the Middle East and North Africa region, the Gulf countries like Saudi Arabia, Qatar, United Arab Emirates and Kuwait reported the highest numbers of confirmed cases proportionally to the population size(11). According to the Organization for Economic Cooperation and Development, some countries in the region have taken crucial measures to combat this pandemic, closing schools, kindergartens, religious places, airports and malls, as well as preventing social gatherings. Others have gone far by suspending government departments(12)

Further, stress and anxiety from the pandemic may be associated with health issues, including poor dietary choices and weight gain (13, 14). Several studies across the globe reported weight gain during the COVID-19 lockdowns (15,16). In the KSA, two studies found that the proportion of those who have gained weight during the pandemic ranged between 22 and 27.5% (17,18) . also in Saudi Arabia, the proportion of those who reported a weight gain of 2–4 kg during the pandemic was 27.3%, with a significant increase in the proportion of those who reported “highly increased” weight during the pandemic as compared to before the pandemic(19) . Such impact of the COVID-19 pandemic on weight will influence future disease burden and population health.(20)

Risk groups of weight gain during the pandemic have been previously investigated(21) . For example, women and youth were more likely to gain weight during the pandemic, particularly during the lockdowns(22,23). Also, comorbidities such as hypertension and diabetes were explored for their potential association with weight change during the pandemic (25,26). Interestingly, those with diabetes were more likely to lose weight during the pandemic, which may have been mediated by an improvement in the glycemic control (26).

Literature review: This study sheds light on the epidemiological, nutritional, and health-related facets of COVID-19 infected patients

during the current pandemic as well as the associated determinants and predictors of post-COVID-19 complications in KSA. The Spread of Coronavirus Disease 2019 (COVID-19) has prompted the lamentable loss of numerous human living, also as the burden of enormous financial, obesity and social disturbance across the world. Alongside defensive measures, for example, social separating and isolate, a viable immunization will be the best system for moderating the spread of COVD-19 and advancing positive clinical and financial results .

Numerous literature have documented that obesity is an important modifiable risk factor Furthermore, it has been linked to many adverse health consequences including hypertension, hyperglycemia, dyslipidemia, cardio-vascular diseases, osteoarthritis, gallbladder diseases, respiratory tract diseases and psychiatric disorders(27). The prevalence of obesity has increased dramatically throughout the last 3 decades with adverse consequences to public health (28). Obesity is defined by a 30 or higher body mass index (BMI) (29)

Health organizations have been working on various approaches and precautionary measures to prevent the disease from spreading. Raise awareness about healthy eating during the curfew, but there is limited attention to this aspect. Having a healthy dietary intake and staying physical active are also very important to meeting the recommended micronutrient levels (especially antioxidants) and maintaining a good overall nutritional health during the curfew. Moreover, using online nutrition education interventions aimed at behavioral change could also be very effective during this critical time.(16)

Additionally, Fox et al. (30) emphasized that women's empowerment associated with economic development, robustly predicts higher mean BMI . As it turns out, the association is complex and differs depending on the country of study, and therefore on socio-demographic specificity. Perhaps this relationship is valid in typical market and lifestyle conditions. It is also possible that the time of COVID-19 isolation was completely different from previous people's experiences, unpredictable and stressful, and therefore cannot be compared to times of relative economic calm, but no comparative data are available yet. It is important to note that weight gain prevailed in women with obesity before the pandemic.(30)

In Poland, the greatest attention is paid to excessive body weight. According to the WHO Global Health Observatory data, in 2016, the percentage of women with excessive body weight (BMI 25 kg/m2) accounted for 39.2% in the world, 54.3% in Europe, and 51.1% in Poland, which was comparable with other European countries, like Italy (51.5%) and Spain (54.1%). The results of the last Polish study (Autumn 2018) indicated that excessive body weight characterized 52.4% of women, and among them, 11.3% had obesity . The growing pandemic of obesity, not only in women, is observed in most of the world and also in Poland, which causes a serious public health problem. A common health consequence of obesity in women is the raised risk for diet-related diseases, that is, diabetes, cardiovascular diseases, and some cancers (31)

Abbade and Dewes showed (32), that economic development influences negatively the obesogenic environment and thus the obesogenic severity. Interestingly, the results of study conducted in Poland among the population aged 15–29 years are in line indicate the positive association between the economic situation and obesity prevalence.(33)

The increase in intake of foods reach in fat and sugars and/or a decrease in physical activity due to increasing urbanization are the main and obvious reasons for the positive energy balance and the weight gain, the changes in body weight can affect a significant percentage of the population. People who are overweight or obese are most prone to those negative modifications. Considering the pandemic nature of obesity and COVID-19, their cumulative consequences can strongly affect the health situation of societies, because, in addition to an increase in total food intake and particularly in the consumption of unhealthy foods, the self-reporting of boredom/loneliness, anxiety/depression have also been noted.(34)

Rationale: COVID-19 pandemic and its associated circumstances had adversely affected patients with the general population became vulnerable to the allot of impacts of COVID-19 worldwide, found that the COVID-19 effect increased the rate on the obesity and chronic diseases, as of 13 April 2020, commercial centers, restaurants, beaches, and resorts were closed, and a 24-h curfew has been implemented in many cities in Saudi Arabia. Residents are authorized to leave for essentials, like food and medications, between 6 a.m. and 3 p.m. Which led to an increase in people's leisure periods, and thus people spent most of their time eating which led to weight gain among people.

Aim of the Study: To assess the impact of COVID-19 virus on the obesity and depression patient's attendants in primary health care center in Makah Al-Mukarramah.

Objectives:

- To assess the health implications of COVID-19 among a sample of adults with obesity in Saudi Arabia during this pandemic a COVID-19
- To describe the effect of the COVID-19 stay-at-home orders are influencing physical health among populations, including those with obesity

SUBJECTS AND METHODS

Study design: The study has been cross-sectional carried out in Makah Al-mukarramh is the holy city of every Muslim in the world. It is the main place of the pilgrims to perform Umrah and Hajj. Also, it has 85 PHC centers under supervision of Directorate of Health Affairs of Makah Al-Mukarramah. These centers distributed under 7 health care sectors and each sector contains around 10 – 14 primary health care centers. Three health care sectors inside Makah Al-Mukarramah city (urban) with 37 primary health care centers underneath and four sectors are outside Makah (rural) with 48 primary health care centers. The three healthcare sectors inside Makah Al-Mukarramah are Al-Ka'akya with 11 primary healthcare centers, Al-Adl with 12 primary healthcare centers and Al-Zahir with 14 primary healthcare centers.

Study setting / study area: A study participant has been recruited on Makah Al-mukarramh including PHC centers under supervision of Directorate of Health Affairs of Makah Al-Mukarramah in Saudi Arabia. They are distinguished by their environment and the large number of residents in them, as well as the large number of foreigners one of the most important characteristics of Makah is its locations, which is characterized good environment and the large number of residents in them .

Study population: The researcher selected participants have obesity has been recruited from PHC centers in the Saudi Arabia. Including Al-Ka'akya, Al-Zahir primary healthcare centers.

Study design: A cross-sectional study has been conducted to assess the effect of COVID-19 virus on the obesity on Population at Saudi Arabia in Makkah Al-Mukarramah attendants in primary health care center data collection during 2020.

Eligibility Criteria

Inclusion criteria: The inclusion criteria were healthy Saudi females and males and have obesity(30–60 years old) living in Saudi Arabia

Exclusion criteria : Any participants who were non-Saudi nationals; pregnant or lactating women; and those previously diagnosed with sleep and/or psychiatric disorders, gastrointestinal disorders, significant proteinuria or amyloidosis, arthritis, anemia, mala absorption, or comorbid chronic diseases (e.g., thyroid disorders, diabetes mellitus, malignancies, and chronic obstructive pulmonary disease)

- Participants who refused to participate in the study
- Patients with language barriers .
- Saudi less than 30 years

Sample size :The total number of participants has been recruited from PHC centers in the Saudi Arabia. Including Al-Ka'akya, Al-Zahir primary healthcare centers. Assuming the adult Saudi

population to be 23,468,225 Based on this information sample size was calculated using a website (raosoft.com). The resulted estimated sample size is (300) . The confidence interval is 95% and margin of error is 5%. The estimated prevalence used is 50% to calculate maximum sample size .

Sampling technique: The researcher has been using simple random sample technique. The researcher obtained the approval from family medicine program administrator, after that, the researcher has been Permission from the regional Research and Ethical Committee and participants. The online survey will be disabled when the sample size is achieved, the primary participants will be requested to rollout the survey further .

Study field : Study has been conducted take place between 1/4/2020 to 31/5/2020.

Data collection tool: The self-administered questionnaire is designed based on previous studies and frameworks to assess prevalence of obesity and depression among the Population in Saudi Arabia during Covid-19 Pandemic . The questionnaire was developed in English and was then translated into Arabic. The questions were first pre-tested and were revised and finalized after it was pilot tested. Before completing the survey, participants were required to indicate their consent using a forced response question followed by the survey questionnaires. The survey is estimated to take 9 min to complete .

To collect the information, a set of questions were constructed and developed. All questions were closed-ended, with tick boxes provided for responses; participants answered the questionnaires from 1 March 2020, to 31 March 2020

Data collection tool: The questionnaire is designed based on previous studies and frameworks to effect of COVID-19 virus on the obesity on Population at Saudi Arabia during Covid-19 Pandemic . The questionnaire was developed in English and was then translated into Arabic. The questions were first pre-tested and were revised and finalized after it was pilot tested. Before completing the survey, participants were required to indicate their consent using a forced response question followed by the survey questionnaires. The survey is estimated to take ~10 min to complete .

To collect the information, a set of questions were constructed and developed. All questions were closed-ended, with tick boxes provided for responses, paretic pants answered the questionnaires from between 1/4/2020 to 1/5/2020

The questionnaire consisted of questions that

First part General and Socio demographic Information

These variables included contact data (email or mobile phone number), age, education level, income, marital status, Chronic Medical conditions, Working/studying from home.

Second part The questionnaire collected socio-demographic characteristics, the BMI category changes and weight changes during the COVID-19, obesity information.

Third part: This study used the Arabic version that has been validated and extensively used in the Arabian population. Participants were asked to report their height in cm and their weight in kg and these values were used to determine the body mass index (BMI, kg/m2). The World Health Organizations (WHO) categorizes BMI cutoffs into four groups: underweight (<18.5 kg/m2), normal weight (18.5–24.9 kg/m2), overweight (25.0–29.9 kg/m2), and obese (>30 kg/m2). Questions related to the mandatory quarantine period included weight change because of lockdown (increase/decrease/no change), following a weight loss diet (yes/no), number of meals and snacks per day, fast food intake and its frequency, and the frequency of eating or the urge to eat sweets.

A Pilot study : Was carried out at the questions were first pre-tested and were revised and finalized after it was pilot tested. Before completing the survey, participants were required to indicate their consent using a forced response question followed by the survey questionnaires. This study has been conducted and all suggestions taken into consideration.

Statistical Analyses: Data were analyzed using SPSS version 27.0. Continuous variables were presented as the mean± SD, while categorical variables were presented as n (%). Differences in means and percentages were calculated using independent sample t-test, Chi-square, independence to analyses the association and the difference between two categorical variables or using other statistical tests if needed. A p-value < 0.05 was considered statistically significant.

Ethical consideration :

- Permission from family medicine program was obtained .
- Permission from the regional Research and Ethical Committee has been given to conduct our study.
- All the subjects have been participating voluntarily in the study .
- Privacy of information and confidentiality has been maintained .
- Full explanation about the study and its purpose was carried out to obtain their participation.

Budget: Self-funded

RESULTS

Table 1: distribution of Socio-demographic Information of the participants in the obesity Study(n- 300)

	N	%
Age		
30-40 years old	45	15
41-50 years old	66	22
51-60 years old	78	26
More than 60 years	111	37
Gender		
Female	174	58
Male	126	42
Marital status		
Single	90	30
Married.	156	52
Divorced.	54	18
level of education you have completed?		
Primary/ Intermediate	114	38
Secondary school	87	29
university	66	22
Postgraduate Studies	33	11
Income.		
<5,000SR	54	18
SR 5,000-10.000	99	33
SR 10,000-15,000	75	25
SR >15,000	72	24
BMI Category		
underweight	60	20
normal weight	57	19
overweight	90	30
obesity	93	31
Chronic Medical conditions		
Asthma	33	11
Diabetes	105	35
Heart disease	63	21
High blood pressure	54	18
High cholesterol/Hyperlipidemia	45	15
Staying at home since COVID-19		
Not going outside at all	144	48
Going outside for walks or exercise	69	23
Going outside for necessities (food, medications)	45	15
Visiting close family/friends	42	14
Working/studying from home		
Yes	66	22
No	234	78
COVID-19 symptoms		
Asymptomatic	57	19
Very mild	63	21
Moderate	57	19
Severe	66	22
Very severe	57	19

Table 1 shows that most of the participants (37.0%) were in the age group more than 60 years follow by the (26.0%)were in the age 51-60 years, the majority of them were female (58.0%) while male(42.0%), regarding the marital status most of participants married were(52.0%)while single were(30.0%), regarding level of education the majority of participant are Primary/ Intermediate were(38.0%) while secondary school were(29.0%). Regarding the level of income most of participant from SR 5,000 to10.000 were(33.0%) while from SR 10,000 to15,000 were(25.0%),but regarding the BMI category most of participant have obesity were(31.0%) follow by overweight were(30.0%). Regarding the Chronic Medical conditions most of participant have diabetes were(35.0%) while high blood pressure were(21.0%), regarding the studying at home since COVID-19 most of participants Not going outside at all were(48.0%)while going outside for walks or exercise were(23.0%), regarding the Working/studying from home most of participants answer No were(78.0%)while answer Yes were(22.0%), Regarding the COVID-19 symptoms most of participant have severe were(22.0%) while very mild were(21.0%).

Table 2: Distribution of the changes in eating habits among participants status during the COVID-19 in Saudi Arabia .

	N	%
Individuals reporting changes in mealtime during the COVID-19		
No food	30	10
Mild food	51	17
Moderate food	90	30
Severe Food	129	43
Individuals reporting changes in the daily number of meals consumed during the COVID-19		
No food	75	25
Mild food	78	26
Moderate food	93	31
Severe Food	54	18

Table 2 shows that the majority (43.0%) of the Individuals reported changes in mealtime during the COVID-19 to severe food follow by moderate food were(30.0%), also individuals reporting changes in the daily number of meals consumed during the COVID-19 to moderate food were(31.0%) follow by severe food were (18.0%)

Table 3: Distribution Frequency of consumption of particular foods during COVID19 pandemic (Frequencies and percentages)

Food items		Using			Not used
		Weak	Average	High	
Fruits	N	45	66	48	141
	%	15.00	22.00	16.00	47.00
Vegetables	N	87	33	57	123
	%	29.00	11.00	19.00	41.00
Milk and milk products	N	90	45	66	99
	%	30.00	15.00	22.00	33.00
Meat/fish/chicken	N	36	57	165	42
	%	12.00	19.00	55.00	14.00
Bread/rice/pasta	N	48	90	90	72
	%	16.00	30.00	30.00	24.00
Sweets/desserts	N	75	45	93	87
	%	25.00	15.00	31.00	29.00
Salty snacks	N	78	54	60	108
	%	26.00	18.00	20.00	36.00
Coffee/tea	N	33	87	150	30
	%	11.00	29.00	50.00	10.00
Sweetened drinks (soda, juice)	N	30	54	195	21
	%	10.00	18.00	65.00	7.00
Energy drinks	N	33	57	66	144
	%	11.00	19.00	22.00	48.00

Table 4 shows that the food shopping frequency the majority of the sample reported never/ home delivery were(52.0%), regarding the reasons for changing eating habits during the COVID-19 the reasons for these changes the majority were(31.0%) anxiety related to food availability, was reported among by “boredom "were(22.0%) followed by all availability of food at home were (15.0%)and “having more time to cook.” Meanwhile, anxiety related to food unavailability was reported among all food-insecure groups, regarding the predicting body mass changes during pandemic most of participants negative lifestyle changes were(59.0%) while positive lifestyle changes were(41.0%), regarding the stockpile food the majority of the participants answer unchanged (65.0%) while regarding the follow healthy diet plans the majority of the participants unchanged were(66.0%), but regarding during stress eat more majority of the participants answer No were(57.0%), also cooking activity the majority of the participants more activity were(64.0%), but baking activity the majority of the participants Less activity were(70.0%), regarding the cannot afford to eat balanced meals the majority of the participants often were(86.0%), regarding skip meals the majority of the participants answer No were(55.0%)

Table 4: Distribution of the change of food shopping and eating habits since COVID-19 stay-at- obesity study

	N	%
Food shopping frequency		
Never/ Home delivery	156	52
1-2 times/month	36	12
1time/week	54	18
2 times/week	54	18
Reasons for changing eating habits during the COVID-19		
Boredom	66	22
Anxiety related to food availability	93	31
Unavailability of food at home	57	19
Availability of food at home	45	15
Having more time to cook	33	11
Long working hours	27	9
Predicting body mass changes during pandemic		
Negative Lifestyle Changes	177	59
Positive Lifestyle Changes	123	41
Stockpile food		
Less	60	20
Unchanged	195	65
More	45	15
Follow healthy diet plans		
Easier	45	15
Unchanged	198	66
More challenging	57	19
Stress eat more		
Yes	129	43
No	171	57
Cooking activity		
Less	66	22
Unchanged	108	36
More	192	64
Baking activity		
Less	210	70
Unchanged	66	22
More	24	8
Cannot afford to eat balanced meals		
Often	204	68
Sometimes	66	22
Never	30	10
Skip meals		
Yes	135	45
No	165	55

Table 5 Regarding age, results show a significant relation between the Predicting body mass changes during pandemic and age were X^2=59.461 and P-value=0.001, increase(More than 60 years old), while Negative Lifestyle Changes were(36.72%) but in the Positive Lifestyle Changes in the 51-60years old were (45.53%) , regarding gender show a significant relation between the Predicting body mass changes during pandemic and gender were X^2=17.008 and P-value=0.001, increase(female) while

Negative Lifestyle Changes were(67.80%) but in the Positive Lifestyle Changes in the male were(56.10%).

Regarding marital status show a significant relation between the Predicting body mass changes during pandemic and marital status were X^2=37.483 and P-value=0.001, increase(single), while Negative Lifestyle Changes were (39.55%), but in the Positive Lifestyle Changes in the married were(73.17%), regarding level of education show a significant relation between the Predicting body mass changes during pandemic and level of education were X^2=29.935 and P-value=0.001, increase (Primary/ Intermediate) while Negative Lifestyle Changes were (45.20%), but in the Positive Lifestyle Changes in the university were(35.77%), regarding Income show a significant relation between the Predicting body mass changes during pandemic and Income were X^2=55.638 and P-value=0.001, increase (SR >15,000) while Negative Lifestyle Changes were (36.16%), but in the Positive Lifestyle Changes in the SR 5,000-10.000 were(53.66%) while Diet Quality increase in the SR 10,000-15,000were (62%), Regarding BMI Category, results show a significant relation between the Predicting body mass changes during pandemic and BMI Category were X^2=37.234 and P-value=0.001, increase in (obesity), while Negative Lifestyle Changes were(38.42%) but in the Positive Lifestyle Changes in the normal weight were (34.96%).

Table 5: Distribution the relation of socio-demographic data (Age, gender, marital status, level of education and income) and predicting body mass changes during pandemic COVID-19

		Predicting body mass changes during pandemic						Chi-square	
		Negative Lifestyle Changes		Positive Lifestyle Changes		Total			
		N	%	N	%	N	%	X^2	P-value
Age	30-40 years old	30	16.95	15	12.20	45	15	59.461	<0.001*
	41-50 years old	60	33.90	6	4.88	66	22		
	51-60 years old	22	12.43	56	45.53	78	26		
	More than 60 years	65	36.72	46	37.40	111	37		
Gender	Female	120	67.80	54	43.90	174	58	17.008	<0.001*
	Male	57	32.20	69	56.10	126	42		
Marital status	Single	70	39.55	20	16.26	90	30	37.483	<0.001*
	Married.	66	37.29	90	73.17	156	52		
	Divorced.	41	23.16	13	10.57	54	18		
level of education	Primary/ Intermediate	80	45.20	34	27.64	114	38	29.935	<0.001*
	Secondary school	60	33.90	27	21.95	87	29		
	university	22	12.43	44	35.77	66	22		
	Postgraduate Studies	15	8.47	18	14.63	33	11		
Income.	<5,000SR	30	16.95	24	19.51	54	18	55.638	<0.001*
	SR 5,000-10.000	33	18.64	66	53.66	99	33		
	SR 10,000-15,000	50	28.25	25	20.33	75	25		
	SR >15,000	64	36.16	8	6.50	72	24		
BMI Category	underweight	40	22.60	20	16.26	60	20	37.234	<0.001*
	normal weight	14	7.91	43	34.96	57	19		
	overweight	55	31.07	35	28.46	90	30		
	obesity	68	38.42	25	20.33	93	31		

Table 6: Distribution the characteristics of respondents by body weight changes during the pandemic. (chronic medical conditions, staying at home since COVID-19, COVID-19 symptoms) and predicting body mass changes during pandemic COVID-19

		Predicting body mass changes during pandemic						Chi-square	
		Negative Lifestyle Changes		Positive Lifestyle Changes		Total			
		N	%	N	%	N	%	X^2	P-value
Chronic Medical conditions	Asthma	15	8.47	18	14.63	33	11	26.846	0.000
	Diabetes	72	40.68	33	26.83	105	35		
	Heart disease	22	12.43	41	33.33	63	21		
	High blood pressure	40	22.60	14	11.38	54	18		
	High cholesterol/Hyperlipidemia	28	15.82	17	13.82	45	15		
Staying at home since COVID-19	Not going outside at all	90	50.85	54	43.90	144	48	31.659	0.000
	Going outside for walks or exercise	22	12.43	47	38.21	69	23		
	Going outside for necessities (food, medications)	36	20.34	9	7.32	45	15		
	Visiting close family/friends	29	16.38	13	10.57	42	14		
COVID-19 symptoms	Asymptomatic	11	6.21	46	37.40	57	19	97.034	0.000
	Very mild	23	12.99	40	32.52	63	21		
	Moderate	50	28.25	7	5.69	57	19		
	Severe	40	22.60	26	21.14	66	22		
	Very severe	53	29.94	4	3.25	57	19		

Table 6 regarding Chronic Medical conditions show no significant relation between the Predicting body mass changes during pandemic and Chronic Medical conditions were X^2=26.846 and P-value=0.000, increase(Diabetes) while Negative Lifestyle Changes were(40.68%) but in the Positive Lifestyle Changes in the Heart disease were(33.33%). Regarding Staying at home since COVID-19 show no significant relation between the Predicting body mass changes during pandemic and Staying at home since COVID-19 were X^2=31.659 and P-value=0.000, increase(Not going outside at all), while Negative Lifestyle Changes were (50.85%), but in the Positive Lifestyle Changes in the Not going outside at all were(43.90%), regarding COVID-19 symptoms show no significant relation between the Predicting body mass changes during pandemic and COVID-19 symptoms were X^2=97.034 and P-value=0.000, increase (Very severe) while Negative Lifestyle Changes were (29.94%), but in the Positive Lifestyle Changes in the Asymptomatic were(37.40%) .

DISCUSSION

This cross-sectional study provides of the eating habits and lifestyle factors for a sample of (300) on population at Saudi Arabia

in Makah Al-Mukarramah, the purpose of this study was to Impact of COVID-19 virus on the obesity and depression on patient's at Saudi Arabia in Makkah Al-Mukarramah in 2020. The results of this study showed that most of the participants (37.0%) were in the age group more than 60 years follow by the (26.0%)were in the age 51-60 years, the majority of them were female (58.0%) while male(42.0%), regarding the marital status most of participants married were(52.0%)while single were(30.0%), regarding level of education the majority of participant are Primary/ Intermediate were(38.0%) while secondary school were(29.0%). Regarding the level of income most of participant from SR 5,000 to10.000 were(33.0%) while from SR 10,000 to15,000 were(25.0%),but regarding the BMI category most of participant have obesity were(31.0%) follow by overweight were(30.0%). Regarding the Chronic Medical conditions most of participant have diabetes were(35.0%) while high blood pressure were(21.0%), regarding the studying at home since COVID-19 most of participants Not going outside at all were(48.0%)while going outside for walks or exercise were(23.0%), regarding the Working/studying from home most of participants answer No were(78.0%)while answer Yes were(22.0%), Regarding the COVID-19 symptoms most of participant have severe were(22.0%) while very mild were(21.0%).(see table 1)

Since the initial outbreak of COVID-19 disease in China, it has spread widely to various countries. According to the MOH update on the 20th of April 2020, the number of COVID-19 cases raised to 10,484 in Saudi Arabia (35)

Concerns have been raised regarding the impact of the COVID-19 curfew on food accessibility, especially in individuals with They have a shortage of food. The Ministry of Commerce has worked hard to control food prices and support food stores in delivering food to customers during the curfew.(25,26) Public and private initiatives were also developed to deliver food baskets free of charge to families in need.(27,28)

In our study that the majority (43.0%) of the Individuals reported changes in mealtime during the COVID-19 to severe food follow by moderate food were(30.0%), also individuals reporting changes in the daily number of meals consumed during the COVID-19 to moderate food were(31.0%) follow by mild food were (26.0%) (see table 2)

In our study, changes in mealtime during the COVID-19 and rapid weight gain whereas on eating frequency and daily number of meals among individuals. These findings might be different from those in other countries; however, the situation could be quite similar among high-income countries and countries with a high level of food security. The World Bank has warned about a potential rise in food insecurity among vulnerable groups amid the COVID-19 pandemic.(29) Therefore, many countries have taken important measures to improve the food security status of their populations through supporting agriculture and the food market. In addition, numerous financial plans were implemented to cope with theCOVID-19 curfew. The government of Saudi Arabia, through the Ministry of Finance, has provided funds to support the private sector and individuals who lost their income during the crisis [30] Canada and some other countries have also provided similar financial support to businesses and individuals who were negatively affected (31) Despite these efforts, increased prevalence of food insecurity due to COVID-19 pandemic lockdowns was reported among disadvantaged individuals.(32)

An increase in the number of meals consumed per d and a reduction in the percentage of skipping meals during the COVID-19 pandemic were reported by the participants in the present study. This also explains the reported weight gain among this population (see table 3)

We found similarly a study our results, half of participants in this study did not consume fruits daily and one-third did not consume vegetables daily. On the other hand, one-third of the same population reported consuming sweets and salty snacks at least once per d. This unfavorable trend towards a Westernized diet was reported in an ecological study in the region (1961–2007), as the proportion of energy derived from meat and vegetable oils increased significantly, while that from cereals, vegetables, fruits, and milk and dairy products showed a descending trend.(31)

The results clearly demonstrate the need for dietary support of individuals during lockdowns focusing on healthy eating choices. Consuming a diet rich in vegetables and fruits is especially important during these times due to their high content of antioxidants, phytonutrients and anti-inflammatory substances.(36) A recent meta-analysis of observational studies suggested that consuming fruits and vegetables is negatively associated with the metabolic syndrome and its risk factors(29) In addition to being a rich source of fiber, as well as various micronutrients and antioxidants, an adequate intake of fruits and vegetables might optimize the immune competence, role indicated in both the prevention and treatment of COVID-19.(34)

Our study findings also showed that participants had increased eating frequency, also more than one-third of the participants reported never food shopping frequency but Home delivery. (see table 4)

We found similarly a study the participants not engaging in any physical activity during the COVID-19 pandemic even food shopping and of those, over one-third reported gaining weight. No changes in the eating frequency of vegetables and milk and dairy products were expected too as these foods are not frequently consumed by many populations worldwide, including the Saudi population (35) Mildly reported changes in their eating habits because of having more time to cook . Among these participants, 52% were employed and might not have adequate free time to cook usually. After countless businesses were closed during the curfew, individuals might have been having more time to cook and prepare food at home, which are more likely to have more food stocks at home during the curfew. As there were no changes in the number of main meals consumed, participants might have been more likely to have more time to prepare snacks, such as cakes, cookies, pies, and pastries. These findings were observed despite guidance by the WHO to limit the intake of sweets and high-calorie foods during the COVID-19 curfew. Adopting negative eating behaviors and attitudes during the curfew may result in overeating and place individuals at higher risk of obesity, micronutrient deficiencies, and viral infections.(30) (See table 5 ,6)

CONCLUSION

Our data have corroborated similar global manifestations and raised some important reflections on COVID-19 incidence, propagation, and complications in KSA was evident in most patients with Obesity and depression during the COVID-19 pandemic. In addition, The COVID-19 pandemic is a huge challenge for both obese patients but it can also be an opportunity to implement the diffusion of telemedicine and telenutrition to improve the management of obesity, a disease in which physician-patient communication is fundamental and must never be interrupted. Health authorities should be urged to equip primary health care center with such systems not only to attend to COVID-19 patients who stay in home isolation, but also to care for patients that need to be protected from a potentially harmful infection and guide them through the pandemic, explaining the future treatment/management, strategies/plan, and provide advice concerning general prevention measures, research are recommended to better illustrate persistent post-COVID-19 symptoms and their correlation with pre-COVID-19 conditions in various community and clinical settings

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