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The Effect of Obesity on Covid-19 Patient's Attendants in Primary Health Care Center in Makkah Al-Mukarramah

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Abstract

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. Therefore, we designed this study with the objective to determine the effect of obesity and overweight on Covid-19 patient's among (COVID-19) disease Saudis of both gender, between the ages of 30-70 years. (COVID-19) pandemic has so far resulted in over 6.2 million known infections, almost 375,000 deaths and tremendous impact on world economies in a relatively short amount of time. Coronavirus illness 2019 (COVID-19) has quickly spread around the world, constraining nations to apply lockdowns and severe social separating measures. In early 2020, numerous nations have been putting forth attempts to forestall the spread of coronavirus illness (COVID-19) after the World Health Organization (WHO) announced it as a pandemic. This study aimed: To assess the effect of obesity on Covid-19 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. The questionnaire collected socio-demographic characteristics, the impact of COVID-19 the pandemic effect perception on the obesity. Sample population consists number of adults' primary health care center. A self-administered questionnaire was designed and has been send to the study participants through social media platforms and email. Our total participants were(200) Results: a significant relation between the Predicting body mass changes during pandemic and age were X2=68.920 and P-value=0.001, gender show a significant relation between the Predicting body mass changes during pandemic and gender were X2=8.691 and P-value=0.013, significant relation between the Predicting body mass changes during pandemic and marital status were X2=53.829 and P-value=0.001.Conclusion: The study highlights that the the effect of obesity on Covid-19 pandemic patient's at Saudi Arabia in Makkah caused a variety of lifestyle changes, physical inactivity may be a factor that leads to an increase in obesity during Covid-19 Pandemic.

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

Introduction

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).[1]

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 [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 [3] and on 11 March 2020, WHO characterized this epidemiological phenomenon as a global pandemic [4]. 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 [5]. 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 [6]. 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 [7]

The most prevalence of obesity (>35%) was seen in the USA and in Saudi Arabia and a high prevalence of obesity (>20%) was additionally seen in Turkey, Egypt, Libya, Iran, Iraq, South Africa, Canada, Mexico, Australia and in the vast majority of the nations in South America and Europe. What's more, information from the WHO, keep going refreshed on 29 November 2020, show that in these nations with high corpulence pervasiveness, a high combined number of affirmed COVID-19-related passing's per million individuals is being observed19. The question is whether there is a relationship between obesity and severe COVID-19. [8]

Obesity is considered a chronic disease state [9] and currently the major strategy to take action regarding the management of obese patients, particularly metabolically unhealthy patients with a body mass index above 40, is to plan long-term rehabilitation programs.

Indeed, all no urgent medical visits, including clinical practices planned for obesity management, were deferred to ensure social distancing [10] and reduce the virus spread. During this period, a worsening of clinical/functional complaints and nutritional and metabolic status was observed in obese patients due to changes in lifestyle habits and reduction in exercise practice [11]. Many people became stressed and depressed as a result of overexposure to news about the spread of COVID-19 and the “forced” social isolation, which led to an increased incidence of eating disorders, resulting in weight gain [12]. Moreover, patients with severe obesity and those with previous bariatric surgery represent a vulnerable cohort of patients with an increased risk of infection and/or a severe course of COVID-19 [13].

Literature review:

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.

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. [14]

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[15,16]. The prevalence of obesity has increased dramatically throughout the last 3 decades with adverse consequences to public health [17]. Obesity is defined by a 30 or higher body mass index (BMI) [18].

Additionally, Fox et al. [19] 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. [19]

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 [20].

Abbade and Dewes showed [21], 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. [22]

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 [23]

Rationale.

The COVID-19 disease and its socioeconomically and health consequences, 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. In Saudi Arabia, the first case was detected on 2 March 2020, after which there has been a rapid rise in cases. 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 effect of obesity on Covid-19 patient's attendants in primary health care center in Makkah Al-Mukarramah.

Objectives:

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

SUBJECTS AND METHODS

Study design:

The study has been 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. Makah is a modern city and there is a continuous working to improve the infrastructure of Makah for the sake of both Makah citizens and pilgrims. 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:

Study participants 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-Adl, Al-Zahir primary healthcare centers.

Study design:

A cross-sectional study has been conducted to 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 2021.

Eligibility Criteria

a. Inclusion criteria:

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

b. 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-Adl, 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 (200) . 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 1/6/2021 to 31/7/2021.

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 ∼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, participants answered the questionnaires from 1 July 2021, to 31 July2021

Data collection tool:

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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 24.0. 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

The effect of obesity on Covid-19 patients attending in primary health care center in Makkah Al-Mukarramah 2021, total of 200 participants completed the survey for a completion rate of 100%.

Table 1 distribution of Socio-demographic Information of the participants in the obesity Study

	N	%
Age		
30-40 years old	20	10
41-50 years old	50	25
51-60 years old	60	30
More than 60 years	70	35
Gender		
Female	132	66
Male	68	34
Marital status		
Single	48	24
Married.	120	60
Divorced.	32	16
level of education you have completed?		
Primary/ Intermediate	80	40
Secondary school	56	28
university	48	24
Postgraduate Studies	16	8
Income.		
<5,000SR	30	15
SR 5,000-10.000	70	35
SR 10,000-15,000	62	31
SR >15,000	38	19
BMI Category		
underweight	30	15
normal weight	44	22
overweight	70	35
obesity	56	28

Table 1. Cont	N	%
Chronic Medical conditions		
Asthma	30	15
Diabetes	68	34

Heart disease	24	12
High blood pressure	46	23
High cholesterol/Hyperlipidemia	32	16
Staying at home since COVID-19		
Not going outside at all	110	55
Going outside for walks or exercise	40	20
Going outside for necessities (food, medications)	20	10
Visiting close family/friends	30	15
Working/studying from home		
Yes	32	16
No	168	84
COVID-19 symptoms		
Asymptomatic	20	10
Very mild	44	22
Moderate	46	23
Severe	34	17
Very severe	56	28

Table 1 shows that most of the participants (35%) were in the age group more than 60 years follow by the (30.0%)were in the age 51-60 years, the majority of them were female (66.0%) while male(34.0%), regarding the marital status most of participants married were(60%)while single were(24%), regarding level of education the majority of participant are Primary/ Intermediate were(40.0%) while secondary school were(28.0%). Regarding the level of income most of participant from SR 5,000 to10.000 were (35.0%) while from SR 10,000 to15,000 were (31.0%), but regarding the BMI category most of participant have overweight were (35.0%) follow by obesity were (28.0%). Regarding the Chronic Medical conditions most of participant have diabetes were(34.0%) while high blood pressure were(23%), regarding the studying at home since COVID-19 most of participants Not going outside at all were(55.0%)while going outside for walks or exercise were(20%), regarding the Working/studying from home most of participants answer No were(84.0%)while answer Yes were(16.0%), Regarding the COVID-19 symptoms most of participant have very severe were(28.0%) while moderate were(23%).

Table 2 Distribution of the changes in eating habits among participant's status during the COVID-19 in Saudi Arabia.

Individuals reporting changes in mealtime during the COVID-19		
No food	10	5.00
Mild food	30	15.00
Moderate food	44	22.00
Severe Food	116	58.00
Individuals reporting changes in the daily number of meals consumed during the COVID-19		
No food	28	14.00
Mild food	22	11.00
Moderate food	100	50.00
Severe Food	50	25.00

Table 2 shows that the majority (58.0%) of the Individuals reported changes in mealtime during the COVID-19 to severe food follow by moderate food were (22.0%), also individuals reporting changes in the daily number of meals consumed during the COVID-19 to moderate food were (50.0%) follow by severe food were (25.0%)

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

Food items		**≥4 times/d**	**2–3 times/d**	**Once/d**	**1–4times/week**	**Never**	**% of using**
Fruits	**N**	10	30	40	44	76	45.4
	%	5.00	15.00	20.00	22.00	38.00	
Vegetables	**N**	4	10	20	64	102	35
	%	2.00	5.00	10.00	32.00	51.00	
Milk and milk products	**N**	50	60	16	44	30	65.6
	%	25.00	30.00	8.00	22.00	15.00	
Meat/fish/chicken	**N**	170	20	6	4	0	95.6
	%	85.00	10.00	3.00	2.00	0.00	
Bread/rice/pasta	**N**	38	56	50	24	32	64.4

	%	19.00	28.00	25.00	12.00	16.00	
Sweets/desserts	**N**	64	22	50	44	20	66.6
	%	32.00	11.00	25.00	22.00	10.00	
Salty snacks	**N**	20	30	24	44	82	46.2
	%	10.00	15.00	12.00	22.00	41.00	
Coffee/tea	**N**	56	64	44	16	20	72
	%	28.00	32.00	22.00	8.00	10.00	
Sweetened drinks (soda, juice)	**N**	92	50	22	24	12	78.6
	%	46.00	25.00	11.00	12.00	6.00	
Energy drinks	**N**	76	40	22	34	28	70.2
	%	38.00	20.00	11.00	17.00	14.00	

Table 3 presents the frequency of consumption for particular food products during the COVID-19 pandemic among participants. As shown, (38.0%) of surveyed participants did not consume fruits on a daily basis and (51.0%) did not consume vegetables daily. However, (30.0%) of participants reported consuming milk and milk products 2–3 times every day followed by ≥4 times/d(25.0%) and meat/fish/chicken were ≥4 times/d(85.0%). However, were (32.0%)of participants reported consuming sweets or desserts ≥4 times/day and (41.0%) consumed Salty snacks never. Moreover, (32.0%) of participants had tea or coffee at least 2–3 times per d. However, were (46.0%) of participants reported consuming Sweetened drinks (soda, juice) ≥4 times/day. Energy drinks were less popular among the study participants compared with sweetened drinks, as (38.0%) of those surveyed reported consuming sweetened drinks ≥4 times/day and only (14.0%) consumed energy never drinks.

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	124	62
1-2 times/month	26	13
1time/week	30	15
2 times/week	20	10
Reasons for changing eating habits during the COVID-19		
Boredom	30	15
Anxiety related to food availability	64	32
Unavailability of food at home	30	15
Availability of food at home	40	20
Having more time to cook	20	10
Long working hours	16	8
Predicting body mass changes during pandemic		
Negative Lifestyle Changes	128	64
Positive Lifestyle Changes	48	24
Diet Quality	24	12
Stockpile food		
Less	24	12
Unchanged	134	67
More	42	21
Follow healthy diet plans		
Easier	20	10
Unchanged	150	75
More challenging	30	15
Stress eat more		
Yes	98	49
No	102	51
Cooking activity		
Less	22	11
Unchanged	58	29
More	120	60
Baking activity		
Less	150	75
Unchanged	24	12
More	26	13
Cannot afford to eat balanced meals		
Often	126	63
Sometimes	56	28
Never	18	9
Skip meals		
Yes	78	39
No	122	61

Table 4 shows that the food shopping frequency the majority of the sample reported never/ home delivery were (62.0%), regarding the reasons for changing eating habits during the COVID-19 the reasons for these changes

the majority were (32.0%) anxiety related to food availability, was reported among all availability of food at home were (20.0%) followed by "boredom" 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(64.0%) while positive lifestyle changes were(24.0%), regarding the stockpile food the majority of the participants answer unchanged (67.0%) while regarding the follow healthy diet plans the majority of the participants unchanged were(75.0%), but regarding during stress eat more majority of the participants answer No were(51.0%), also cooking activity the majority of the participants more activity were(60.0%), but baking activity the majority of the participants Less activity were(75.0%), regarding the cannot afford to eat balanced meals the majority of the participants often were(63.0%), regarding skip meals the majority of the participants answer No were(61.0%)

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**		**Diet Quality**		**Total**			
		N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**X^2**	**P-value**
Age	**30-40 years old**	18	14.06	2	4.167	0	0	20	10	68.920	<0.001*
	41-50 years old	42	32.81	5	10.42	3	12.5	50	25		
	51-60 years old	15	11.72	35	72.92	10	41.67	60	30		
	More than 60 years	53	41.41	6	12.5	11	45.83	70	35		
Gender	**Female**	75	58.59	38	79.17	19	79.17	132	66	8.691	0.013*
	Male	53	41.41	10	20.83	5	20.83	68	34		
Marital status	**Single**	10	7.813	25	52.08	13	54.17	48	24	53.829	<0.001*
	Married.	97	75.78	15	31.25	8	33.33	120	60		
	Divorced.	21	16.41	8	16.67	3	12.5	32	16		
level of education	**Primary/ Intermediate**	77	60.16	2	4.167	1	4.167	80	40	74.803	<0.001*
	Secondary school	33	25.78	15	31.25	8	33.33	56	28		
	university	11	8.594	25	52.08	12	50	48	24		
	Postgraduate Studies	7	5.469	6	12.5	3	12.5	16	8		
Income.	**<5,000SR**	14	10.94	8	16.67	8	33.33	30	15	15.907	0.014*
	SR 5,000-10.000	52	40.63	12	25	6	25	70	35		
	SR 10,000-15,000	43	33.59	13	27.08	6	25	62	31		
	SR >15,000	19	14.84	15	31.25	4	16.67	38	19		

Table 5 and figure(1) Regarding age, results show a significant relation between the Predicting body mass changes during pandemic and age were X2=68.920 and P-value=0.001, increase(More than 60 years old), while Negative Lifestyle Changes were(41.41%) but in the Positive Lifestyle Changes in the 51-60years old were (72.92%) while Diet Quality increase in (More than 60 years old, were(45.83), regarding gender show a significant relation between the Predicting body mass changes during pandemic and gender were X2=8.691 and P-value=0.013, increase(female) while Negative Lifestyle Changes were(58.59%) but in the Positive Lifestyle Changes in the female were(79.17%) while Diet Quality increase in female were(79.17%). Regarding marital status show a significant relation between the Predicting body mass changes during pandemic and marital status were X2=53.829 and P-value=0.001, increase(Married), while Negative Lifestyle Changes were (75.78%), but in the Positive Lifestyle Changes in the single were(52.08%) while Diet Quality increase in the single were (54.17%), regarding level of education show a significant relation between the Predicting body mass changes during pandemic and level of education were X2=74.803 and P-value=0.001, increase (Primary/ Intermediate) while Negative Lifestyle Changes were (60.16%), but in the

Positive Lifestyle Changes in the university were(52.08%) while Diet Quality increase in the single were (50.0%), regarding Income show a significant relation between the Predicting body mass changes during pandemic and Income were X2=15.907 and P-value=0.014, increase (SR 5,000-10.000) while Negative Lifestyle Changes were (40.63%), but in the Positive Lifestyle Changes in the SR >15,000were(31.25%) while Diet Quality increase in the SR 10,000-15,000were (62%),

Figure (1) 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

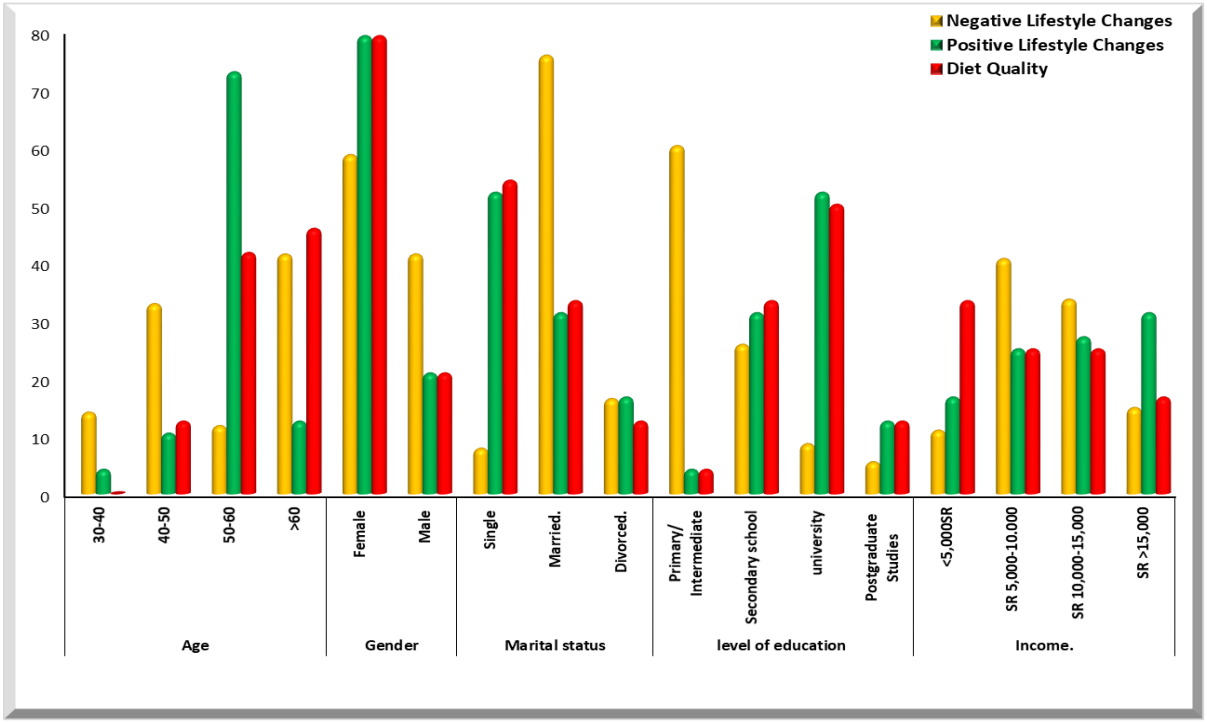


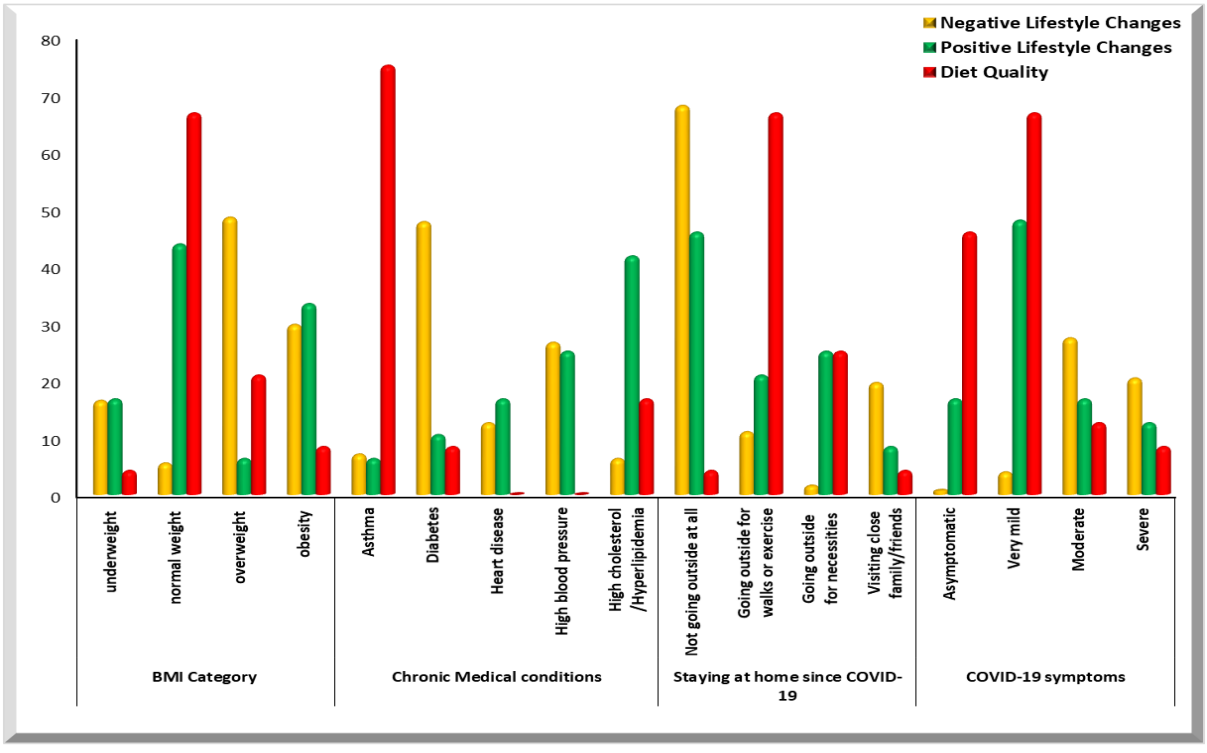
Table 6 Distribution the characteristics of respondents by body weight changes during the pandemic (BMI Category, chronic medical conditions, staying at home since COVID-19, COVID-19 symptoms) and predicting body mass changes during pandemic COVID-19

		Predicting body mass changes during pandemic								Chi-square	
		Negative Lifestyle Changes		Positive Lifestyle Changes		Diet Quality		Total			
		N	%	N	%	N	%	N	%	X^2	P-value
BMI Category	underweight	21	16.41	8	16.67	1	4.167	30	15	73.370	<0.001*
	normal weight	7	5.469	21	43.75	16	66.67	44	22		
	overweight	62	48.44	3	6.25	5	20.83	70	35		
	obesity	38	29.69	16	33.33	2	8.333	56	28		
Chronic Medical conditions	Asthma	9	7.031	3	6.25	18	75	30	15	122.454	<0.001*
	Diabetes	61	47.66	5	10.42	2	8.333	68	34		
	Heart disease	16	12.5	8	16.67	0	0	24	12		
	High blood pressure	34	26.56	12	25	0	0	46	23		
	High cholesterol/ Hyperlipidemia	8	6.25	20	41.67	4	16.67	32	16		
Staying at home since COVID-19	Not going outside at all	87	67.97	22	45.83	1	4.167	110	55	77.694	<0.001*
	Going outside for walks or exercise	14	10.94	10	20.83	16	66.67	40	20		
	Going outside for necessities (food, medications)	2	1.563	12	25	6	25	20	10		

	Visiting close family/friends	25	19.53	4	8.333	1	4.167	30	15		
COVID-19 symptoms	**Asymptomatic**	1	0.781	8	16.67	11	45.83	20	10	101.712	<0.001*
	Very mild	5	3.906	23	47.92	16	66.67	44	22		
	Moderate	35	27.34	8	16.67	3	12.5	46	23		
	Severe	26	20.31	6	12.5	2	8.333	34	17		
	Very severe	50	39.06	3	6.25	3	12.5	56	28		

Table 6 and figure(2) Regarding BMI Category, results show a significant relation between the Predicting body mass changes during pandemic and BMI Category were X2=73.370 and P-value=0.001, increase in (overweight), while Negative Lifestyle Changes were(48.44%) but in the Positive Lifestyle Changes in the normal weight were (43.75%) while Diet Quality increase in (normal weight), were(66.67%), regarding Chronic Medical conditions show a significant relation between the Predicting body mass changes during pandemic and Chronic Medical conditions were X2=122.454 and P-value=0.001, increase(Diabetes) while Negative Lifestyle Changes were(47.66%) but in the Positive Lifestyle Changes in the High cholesterol/ Hyperlipidemia were(41.67%) while Diet Quality increase in female were(75.0%) in obesity. Regarding Staying at home since COVID-19 show a significant relation between the Predicting body mass changes during pandemic and Staying at home since COVID-19 were X2=77.694 and P-value=0.001, increase(Not going outside at all), while Negative Lifestyle Changes were (67.97%), but in the Positive Lifestyle Changes in the Not going outside at all were(45.83%) while Diet Quality increase in the Going outside for walks or exercise were (66.67%), regarding COVID-19 symptoms show a significant relation between the Predicting body mass changes during pandemic and COVID-19 symptoms were X2=101.712and P-value=0.001, increase (Very severe) while Negative Lifestyle Changes were (39.06%), but in the Positive Lifestyle Changes in the Very mild were(47.92%) while Diet Quality increase in the single were (66.67%) in the Very mild.

Figure (2) Distribution the characteristics of respondents by body weight changes during the pandemic (BMI Category, chronic medical conditions, staying at home since COVID-19, COVID-19 symptoms) and predicting body mass changes during pandemic COVID-19



Discussion

This cross-sectional study provides of the eating habits and lifestyle factors for a sample of (200) on Population at Saudi Arabia in Makah Al-Mukarramah, the purpose of this study was to assess the effect of obesity on Covid-19 patient's attendants in primary health care center. The results of this study showed that most of the participants (35%) were in the age group more than 60 years, the majority of them were female (66.0%), marital status most of participants married were(60%), level of education the majority of participant are Primary/ Intermediate were(40.0%), level of income most of participant from SR 5,000 to10.000 were(35.0%), the BMI category most of participant have overweight were(35.0%) most of participant have diabetes follow by obesity were(28.0%). regarding the studying at home since COVID-19 most of participants Not going outside at all were(55.0%)while going outside for walks or exercise were(20%), regarding the Working/studying from home most of participants answer No were(84.0%). Regarding the COVID-19 symptoms most of participant have very severe were (28.0%) while. (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 [24]

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 (58.0%) of the Individuals reported changes in mealtime during the COVID-19 to severe food follow by moderate food were (22.0%), also individuals reporting changes in the daily number of meals consumed during the COVID-19 to moderate food were(50.0%) follow by severe food were (25.0%) (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.

in our study presents the frequency of consumption for particular food products during the COVID-19 pandemic among participants. As shown, (38.0%) of surveyed participants did not consume fruits on a daily basis and (51.0%) did not consume vegetables daily. However, (30.0%) of participants reported consuming milk and milk products 2–3 times every day and meat/fish/chicken were ≥4 times/d (85.0%). However, were (32.0%)of participants reported consuming sweets or desserts ≥4 times/day and (41.0%) consumed Salty snacks never. Moreover, (32.0%) of

participants had tea or coffee at least 2–3 times per d. However, were (46.0%) of participants reported consuming Sweetened drinks (soda, juice) ≥4 times/day. Energy drinks were less popular among the study participants compared with sweetened drinks, as (38.0%) of those surveyed reported consuming sweetened drinks ≥4 times/day and only (14.0%) consumed energy never drinks .(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.[33] 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, in our study the food shopping frequency the majority of the sample reported never/ home delivery were(62.0%), regarding the reasons for changing eating habits during the COVID-19 the reasons for these changes the majority were(32.0%) anxiety related to food availability, was reported among all availability of food at home were (20.0%) followed by “boredom” 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(64.0%) while positive lifestyle changes were(24.0%), regarding the stockpile food the majority of the participants answer unchanged (67.0%) while regarding the follow healthy diet plans the majority of the participants unchanged were(75.0%), but regarding during stress eat more majority of the participants answer No were(51.0%), also cooking activity the majority of the participants more activity were(60.0%), but baking activity the majority of the participants Less activity were(75.0%), regarding the cannot afford to eat balanced meals the majority of the participants often were(63.0%), regarding skip meals the majority of the participants answer No were(61.0%)(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, who 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] Furthermore, it would be very challenging to change negative eating habits and behaviors once they have been adopted.[36].

The results of our study indicate an increase in the predicting body mass changes during pandemic of participants reporting negative Lifestyle Changes, this study was conducted during 2021.The COVID-19 pandemic has been associated with increased anxiety and distress, which in turn affects the lifestyle of individual. [37]

Regarding age, results show a significant relation between the Predicting body mass changes during pandemic and age were X2=68.920 and P-value=0.001, while negative Lifestyle Changes were(41.41%) but in the Positive Lifestyle Changes were (72.92%), gender show a significant relation between the Predicting body mass changes during pandemic and gender while Negative Lifestyle Changes were(58.59%) but in the Positive Lifestyle Changes in the female were(79.17%), marital status show a significant relation between the Predicting body mass changes during pandemic and while negative Lifestyle Changes were (75.78%)

Regarding BMI Category, results show a significant relation between the Predicting body mass changes during pandemic and BMI Category while negative Lifestyle Changes were (48.44%), regarding Chronic Medical conditions show a significant relation between the Predicting body mass changes during pandemic and Chronic Medical conditions while negative Lifestyle Changes were (47.66%) (See table 5 ,6)

We found similarly in anther studies that patients with obesity no data about their weight changes were available. Thus, these were the first available data about changes in nutritional habits and weight during and before the pandemic COVID-19 pandemic. Low education might be a proxy for low socioeconomic level, a condition potentially impacting on food choice indeed, the increased social isolation, loneliness, boredom, anxiety, and depression generated by the pandemic might have played major roles in the lifestyle changes. In particular, self-reported anxiety/depression was the strongest predictor of weight gain in our patients. It is well known that emotional changes and mood disorders influence food choices, with the search for comfort foods, such as processed snacks and sweets [38]. Furthermore, individuals with obesity are at increased risk of either chronic or acute diseases, including COVID-19 infection and complications, as suggested by growing evidence [39]. The increased risk is due to multiple factors in particular; excess ectopic fat might reduce both protective cardiorespiratory reserves, as well as potentiate the immune deregulation and pro-inflammatory response, and have detrimental effects on lung function [40]. Finally, the consumption of unhealthy diets has been proposed to adversely impact on susceptibility to COVID-19 and recovery [41]. Increasing weight might be a vicious circle leading to increased infection risk so that, now, obesity and COVID-19 infection can be considered two public healthy pandemics colliding [42]

Conclusion

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.

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