Impact of COVID-19 Virus on the Obesity and Depression on Population at Saudi Arabia in Makkah Al-Mukarramah

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Abstract:

Background

The COVID-19 pandemic is spreading all over the world, particularly in developed countries where obesity and depression is also widespread. 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 characterised 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. Indeed, the biological role of adipose tissue in sustaining SARS-CoV-2 infection is not completely elucidated. During pandemics, including the most recent COVID-19 pandemic, the mental health of population healthcare is expected to be affected negatively, impacting the lifestyle of population. The pandemic of the coronavirus SARS-CoV-2 (COVID-19) has caused significant disruption in everyday lifestyle.

Aim of the study: to assess the Impact of COVID-19 virus on the obesity and depression on Population at Saudi Arabia in Makkah Al-Mukarramah.

Method: Across-sectional study among Population residents in primary health care center in Makkah Al-Mukarramah was conducted using an online questionnaire designed during April 2021. The questionnaire collected socio-demographic characteristics, depression Symptoms in participants before and during the COVID-19 Pandemic (via the PHQ-9 patient depression questionnaire) and the BMI category changes and weight changes during and before the COVID-19, our total participants were (150).

Results: the BMI category during and before the pandemic, the total (during COVID-19 and before COVID-19) a significant positive increase of Wilcoxon Signed Ranks Test were P-value=0.001and Z (10.629) and while changed in before COVID-19 the Range (23.3-32.7)

While (Mean ±SD) were (28.625±2.061) to become during COVID-19 the range (17.7-31.7) . While (Mean ±SD) were (26.296±2.792).

Conclusion: The study highlights that the Impact of COVID-19 virus on the obesity and depression on Population at Saudi Arabia in Makkah due to the COVID-19 pandemic caused a variety of lifestyle changes, physical inactivity and psychological problems among Population in the Makkah. In addition Anxiety and depression levels amongst Population at Saudi Arabia in healthcare were found to be high when assessed during the COVID-19 pandemic.

Keywords: Impact, COVID-19, obesity, depression, Population, Saudi Arabia, Makkah**.**

1. Introduction

Good health and wellbeing prosperity just as capable utilization and creation are 2 of the 17 Sustainable Development Goals In many nations [1] 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 [2]. In Saudi Arabia, the principal COVID-19 case was accounted for on March 2, 2020 [3]. Before the finish of January 2020,WHOdeclared COVID-19 as a general health crisis of worldwide concern[4] and on 11 March 2020, WHO portrayed this epidemiological phenomenon as a worldwide pandemic.[5], the Gulf nations like Saudi Arabia, Qatar, United Arab Emirates and Kuwait detailed the most numbers of confirmed cases proportionally to the population size.[6]. Therefore, a fractional check in time was started seven days after in numerous urban areas the nation over. Developing worries of the infection spreading brought about a continuous shutting of shops, shopping centers, and eateries. A 24-hour time limitation then, at that point started on April 2 in certain urban areas around the nation, including Makkah and Madinah, trailed by the capital of Riyadh and Jeddah and numerous different urban areas on April 6.[7,8]. The 24-hour curfew was decided based on the number of reported cases in every city. Numerous different countries have additionally taken comparative measures by advancing social separating and isolate guidelines to ensure the safety of populations at large.[9,10]. This authorized isolate can have a heavy psychological impact, above all among persons with obesity who are already at risk of social isolation and experiencing higher rates of depression. [11]. The emotional wellness trouble during the COVID-19 outbreak has been evaluated by a few studies, and an increased rate of anxiety disorder, depressive symptoms, perceived stress, post-traumatic stress disorder, and poor sleep quality has been reported.[12,13]. Usual way of life propensities have been intensely upset by the compulsory stay-at-home requests, additionally rise of obesity significantly during a the pandemic. Which may result in important behavior changes, particularly dietary habits . [14]

There is restricted data on the relationships between limitations to during the COVID-19 and changes in predominance rate obesity .[15]

The Overweight and impaired metabolic health might strongly, and independently of other comorbidities, partner with expanded danger of serious COVID-19. We consider this aspect very important, as both obesity and impaired metabolic health are modifiable danger factors that can regularly be successfully treated by way of life intervention.[16]

In light of information from the WHO, last refreshed in 2018, all around the world, 13% of grown-ups matured 18 years and older had obesity in 2016 [17]. 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.[18] Psychological health is touchy to traumatic mishaps and their social and economic consequences. Previous studies on disruptions to life owing to disasters, epidemics, or common distress propose that openness to large-scale traumatic events are associated with expanded weight of psychological illness in the populaces affected.[19] For instance, after September 11, 2001, 9.6%of Manhattan inhabitants announced indications reliable with depression and 7.5%reported manifestations predictable with posttraumatic stress disorder.[20] Increases in mental illness behavior have additionally been reported after different epidemics, like the Ebola infection and SARS outbreak, what's more, social interruptions in everyday living after civil unrest, for instance, have been discovered to be related with psychological sickness. Information from Hong Kong show more noteworthy degrees of depression, anxiety, and mental distress during the 2019 Hong Kong common protests.[21]

Mental sickness has been very much recorded in the wake of previous financial recessions, especially among people who are jobless and are otherwise affected by social and economic adversity.[22] Early proof from published studies suggests that COVID-19 is related with mental illness.15 Among medical care laborers in China who were presented to patients with COVID-19, 50.4% revealed manifestations of depression.[19] Ebola, MERS, and SARS pestilences all showed an effect on psychological wellness that incorporates sadness, and even substance misuse has been accounted for[21]. During the MERS flare-up in Jeddah, western Saudi Arabia, a study announced a critical relationship between the degree of anxiety and avoiding behaviors [19] The coronavirus 2019 (COVID-19) pandemic and the arrangements to contain it have been a close to pervasive openness with unknown effects on depression symptoms.

2. Literature review:

To the best of our knowledge, there are no published studies assessing the general population response to the emerging coronavirus infections in Saudi Arabia. WHO and MOH have proposed a few practices that can help tallness the mindfulness about practices of manifestations of the pandemic. Government of Saudi Arabia has been making a significant effort to ensure that of COVID-19 virus not affecting obesity and depression in to all residents minimize the effects of the pandemic .

In the current pandemic, a recent study carried out in china concerning COVID-19 psychological impact, revealed that 53.8% of respondents are showing moderate to severe psychological impact, 16.5% and 28.8% reported moderate to high depressive or anxiety

symptoms respectfully, and 8.1% moderate to high levels of stress were reported. Anxiety and depression symptoms showed no decline four weeks after the COVID-19 pandemic [22].

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 [23].

Sidor and Rzymski [24] showed, on average, a similar tendency for both genders without specifying the women. The results of Di Renzo et al. [25] only show in Italian adults that the perception of weight gain during lockdown was observed in 48.6% of the population (men and women), but in fact, the changes have not been studied. Staying at home for a long time can also be conducive to eating tasty meals, snacks, and drinking alcohol [26]. 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 [27]

Abbade and Dewes showed [28], 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.[29]

Several studies have reported the impact of COVID-19 not only on the anxiety and depression levels, but also on the sleep pattern among individuals [30,31]. Emotional distresses can lead to changes in sleep patterns and sleep difficulties, which have been reported among individuals and students who suffer from higher levels of stress, anxiety and depression [32].

In a study of health care workers in Hubei province and surrounding regions, Lai et al15 found similar levels of depression: 49.6%of participants had no depression (vs 47.5%of participants), while 35.6%of participants had mild depression (vs 24.6%), 8.6%of participants had moderate depression (vs14.8%), and 6.2%of participants had moderately severe depression (vs 7.9%). The Lai et al15 sample in China included only health care professionals and was concentrated in the Hubei region, while our sample included a representative sample of all US residents and sampled the whole country.[33]

2.1 Rationale

The COVID-19 pandemic is a major problem in our society and most expected to continue to enormous burdens, as it was increasingly exposed to the COVID-19 disease and it's socioeconomically and health consequences, the general population became vulnerable to the a lot of impacts of COVID-19 worldwide, found that the COVID-19 effect increased the rate on the obesity and depression. They highlighted the possibility of a biological link between the COVID-19 and obesity, and depression, 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 and depression among people.

2.2 Aim of the Study

To assess the Impact of COVID-19 virus on the obesity and depression on Population at Saudi Arabia in Makkah Al-Mukarramah.

2.3 Objectives:

➤ To describe the Impact of COVID-19 virus on the obesity and depression on Population at Saudi Arabia in Makkah Al-Mukarramah.
➤ To assess the prevalence of the obesity and depression on Population at Saudi Arabia in Makkah Al-Mukarramah.

3. Subjects and Methods

3.1 Study design:

The study has been carried out in Makkah 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. Makkah is a modern city and there is a continuous working to improve the infrastructure of Makkah for the sake of both Makkah citizens and pilgrims.   Also, it has 85 PHC centers under supervision of Directorate of Health Affairs of Makkah 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 Makkah Al-Mukarramah city (urban) with 37 primary health care centers underneath and four sectors are outside Makkah (rural) with 48 primary health care centers. The three healthcare sectors inside Makkah 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.

3.2 Study setting / study area:

Study participants has been recruited on Makkah Al-mukarramh including PHC centers under supervision of Directorate of Health Affairs of Makkah 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

Makkah is its locations, which is characterized good environment and the large number of residents in them.

3.3 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.

3.4 Study design:

A cross-sectional study has been conducted to to assess the Impact of COVID-19 virus on the obesity and depression on Population at Saudi Arabia in Makkah Al-Mukarramah attendants in primary health care center data collection during April 2021.

3.5 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 and at the time the study was conducted have COVID-19
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

3.6 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 (150) . The confidence interval is 95% and margin of error is 5%. The estimated prevalence used is 50% to calculate maximum sample size .

3.7 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.

3.7 Study field :

Study has been conducted take place between 1/4/2021 to 1/5/2021.

3.8 Data collection tool:

The questionnaire is designed based on previous studies and frameworks to Impact of COVID-19 virus on the obesity and depression 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, participants answered the questionnaires from between 1/4/2021 to 1/5/2021

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, depression Symptoms in participants before and during the COVID-19 Pandemic (via the PHQ-9 patient depression questionnaire)
Third part: Third part: the BMI category changes and weight changes during and before the COVID-19, obesity and depression Information and Symptoms. 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 (Likert-type scale [hereafter "Likert scale).

3.9 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.

3.9 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, Wilcoxon Signed Ranks Test, 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.

3.10 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.

3.11 Budget: Self-funded

4. Results:

Impact of COVID-19 virus on the obesity and depression on Population at Saudi Arabia in Makkah Al-Mukarramah in 2021, total of 150 participants completed the survey for a completion rate of 100%.

Table 1 distribution of demographic characteristics of the research COVID-19 patients .
(n=150)

	N	%
Age		
30-40 years old	15	10.00
41-50 years old	37	24.67
51-60 years old	45	30.00
More than 60 years	53	35.33
Gender		
Female	99	66.00
Male	51	34.00
Marital status		
Single	37	24.67
Married.	89	59.33
Divorced.	24	16.00
level of education		
Primary/ Intermediate	60	40.00
Secondary school	42	28.00
university	36	24.00
Postgraduate Studies	12	8.00
Chronic Medical conditions		
Asthma	23	15.33
Diabetes	51	34.00
Heart disease	18	12.00
High blood pressure	34	22.67
High cholesterol/Hyperlipidemia	24	16.00
Working/studying from home		

Yes	23	15.33	
No	127	84.67	

Table 1 shows that most of the participants (35.33%) 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(59.33%)while single were(24.67%), regarding level of education the majority of participant are Primary/ Intermediate were(40.0%) while secondary school were(28.0%). Regarding the Chronic Medical conditions most of participant have diabetes were(34.0%) while high blood pressure were(22.67%), regarding the Working/studying from home most of participants answer No were(84.67%)while answer Yes were(15.33%).

Table 2 distribution the prevalence of Depression Symptoms in participants Before and During the COVID-19 Pandemic

Items		PHQ-9								Wilcoxon Signed Ranks Test	
		0		1		2		3			
		N	%	N	%	N	%	N	%	Z	P-value
1. Little interest or pleasure in doing things	Before	16	10.7%	62	41.3%	59	39.3%	13	8.7%	8.572	<0.001*
	During	0	0.0%	1	0.7%	103	68.7%	46	30.7%		
2. Feeling down, depressed, or hopeless	Before	19	12.7%	55	36.7%	64	42.7%	12	8.0%	8.019	<0.001*
	During	0	0.0%	2	1.3%	110	73.3%	38	25.3%		
3. Trouble falling or staying asleep, or sleeping too much	Before	12	8.0%	53	35.3%	67	44.7%	18	12.0%	7.605	<0.001*
	During	0	0.0%	2	1.3%	95	63.3%	53	35.3%		
4. Feeling tired or having little energy	Before	17	11.3%	54	36.0%	60	40.0%	19	12.7%	7.078	<0.001*
	During	0	0.0%	2	1.3%	105	70.0%	43	28.7%		
5. Poor appetite or overeating	Before	14	9.3%	46	30.7%	68	45.3%	22	14.7%	6.371	<0.001*
	During	0	0.0%	1	0.7%	111	74.0%	38	25.3%		
6. Feeling bad about yourself or that you are a failure or have let yourself or your family down	Before	19	12.7%	64	42.7%	52	34.7%	15	10.0%	7.819	<0.001*
	During	0	0.0%	3	2.0%	105	70.0%	42	28.0%		
7. Trouble concentrating on things, such as reading the newspaper or watching television	Before	13	8.7%	59	39.3%	66	44.0%	12	8.0%	8.053	<0.001*
	During	0	0.0%	3	2.0%	101	67.3%	46	30.7%		
8.Moving or speaking so slowly that other people could have noticed.	Before	14	9.3%	52	34.7%	67	44.7%	17	11.3%	7.164	<0.001*
	During	0	0.0%	1	0.7%	109	72.7%	40	26.7%		

Or the opposite being so figety or restless that you have been moving around a lot more than usual										
9.Thoughts that you would be better off dead, or of hurting yourself	**Before**	19	12.7%	57	38.0%	60	40.0%	14	9.3%	7.362	<0.001*
	During	0	0.0%	3	2.0%	109	72.7%	38	25.3%		
Total PHQ-9 (before)	**Range (Mean±SD)**	7-20 (13.407±2.433)								10.498	<0.001*
Total PHQ-9 (During)	**Range (Mean±SD)**	17-24 (20.444±.416)									

Table 2 shows a significant positive higher levels of depression symptoms were observed during COVID-19 compared with before COVID-19 patients for each items in the score 2 and 3 were P-value=0.001 were and z respectively (items 1 .572 is 68.7%, 30.7% , item 2. is73.3%, 25.3% , item3 .63.3%, 35.3%, item4. 70.0%, 28.7%a item5.74.0%,25.3%,item6.70.0%, 28.0%, item7. 67.3%,30.7%, item8. 72.7%,26.7% ,item9 72.7%, 25.3%) and also the total PHQ-9 (During COVID-19)a significant positive increase of depression symptoms were observed were P-value=0.001 and Range(17-24) while (Mean ±SD) were(20.444±.416)and Z(10.498).

Table 3 distribution of the BMI category changes and weight changes during and before the COVID-19 pandemic in participants

			BMI before			**Total**
			Normal weight	**Overweight**	**Obese class I**	
BMI during	**Underweight**	**N**	3	0	0	3
		%	2.0%	0.0%	0.0%	2.0%
	Normal weight	**N**	6	27	0	33
		%	4.0%	18.0%	0.0%	22.0%
	Overweight	**N**	0	59	48	107
		%	0.0%	39.3%	32.0%	71.3%
	Obese class I	**N**	0	0	7	7
		%	0.0%	0.0%	4.7%	4.7%
Total		**N**	9	86	55	150
		%	6.0%	57.3%	36.7%	100.0%
BMI (before)		**Range (Mean±SD)**	23.3-32.7 (28.625±2.061)			
BMI (During)		**Range (Mean±SD)**	17.7-31.7 (26.296±2.792)			
Wilcoxon Signed Ranks Test		**Z**	10.629			
		P-value	<0.001*			

Regarding level BMI before and during COVID-19 Pandemic the change in normal weight in before to become underweight during were(2.0%), also in the overweight before change to normal weight in during were(18.0%) , while obese class 1 before change to overweight during were(32.0%). Considering the BMI category during and before the pandemic, the total (during COVID-19 and before COVID-19)a significant positive increase of Wilcoxon Signed Ranks Test were P-value=0.001and Z(10.629) and while changed in before COVID-19 the Range(23.3-32.7) While (Mean ±SD) were (28.625±2.061) to become during COVID-19 the range (17.7-31.7) . While (Mean ±SD) were (26.296±2.792).

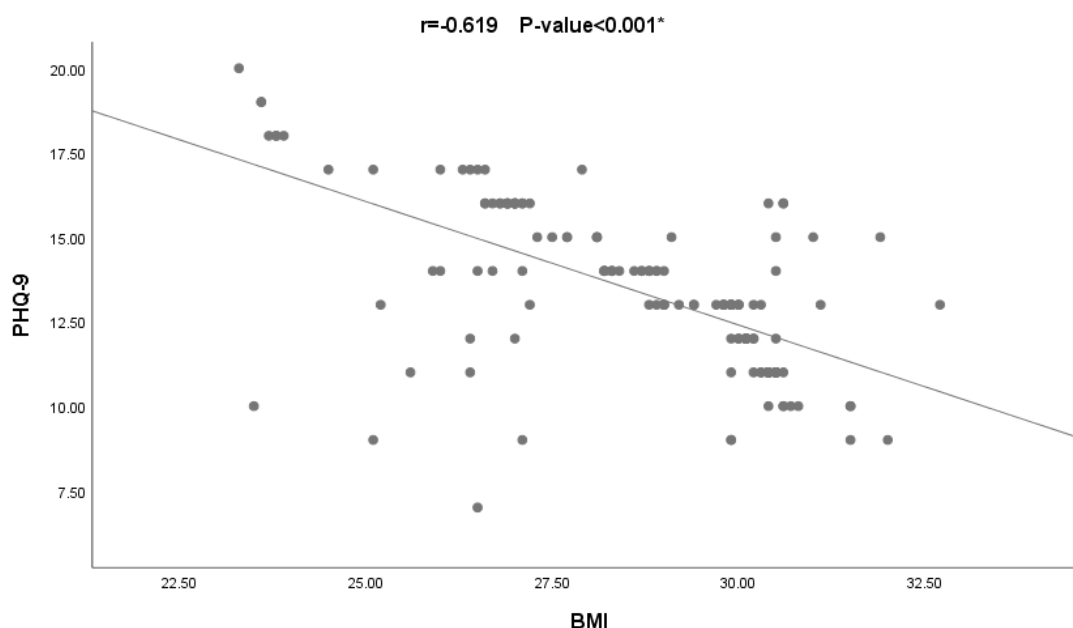**Figure (1) Correlation between PHQ-9 and BMI**

Figure (1) Show that is a significant positive correlation between PHQ-9 and BMI were r= - 0.619 And p-value =0.001

Table 4 Distribution the relation of socio-demographic data (Age, gender, marital status, level of education) and PHQ-9 about depression symptoms COVID-19 among

		N	PHQ-9 during			F or T	ANOVA or T-test	
			Mean	±	SD		Test value	P-value
Age	**30-40 years old**	15	22.467	±	1.187	F	140.516	<0.001*
	41-50 years old	37	21.568	±	0.603			
	51-60 years old	45	20.556	±	0.546			
	More than 60 years	53	18.981	±	0.772			
Gender	**Female**	99	21.212	±	0.993	T	140.516	<0.001*
	Male	51	18.941	±	0.759			

Marital status	Single	31	21.194 ± 0.402	F	122.327	<0.001*
	Married.	95	19.653 ± 1.008			
	Divorced.	24	22.583 ± 0.717			
level of education	Primary/ Intermediate	60	21.367 ± 0.823	F	63.159	<0.001*
	Secondary school	42	20.762 ± 1.246			
	university	36	19.306 ± 0.822			
	Postgraduate Studies	12	18.083 ± 0.515			

Table 4 and figure(2) Regarding age, results show a significant relation between the PHQ-9 about depression symptoms and age were F=140.516 and P-value=0.001, increase(30-40 years old followed by from(41-50 years old), the mean +SD respectively were (22.467±1.187, 21.568± 0.603), regarding gender show a significant relation between the PHQ-9 about depression symptoms and gender were T=140.516 and P-value=0.001, increase(female), the mean +SD were (21.212±0.993).

Regarding marital status show a significant relation between the PHQ-9 about depression symptoms and marital status were F=122.327 and P-value=0.001, increase(Divorced), the mean +SD were (22.583±0.717), regarding level of education show a significant relation between the PHQ-9 about depression symptoms and level of education were F=63.139 and P-value=0.001, increase(Primary/ Intermediate), the mean +SD were (21.367±0.823).

Figure (2) Distribution the relation of socio-demographic data (Age, gender, nationality, marital status, level of education and region) and PHQ-9 about depression symptoms COVID-19 among
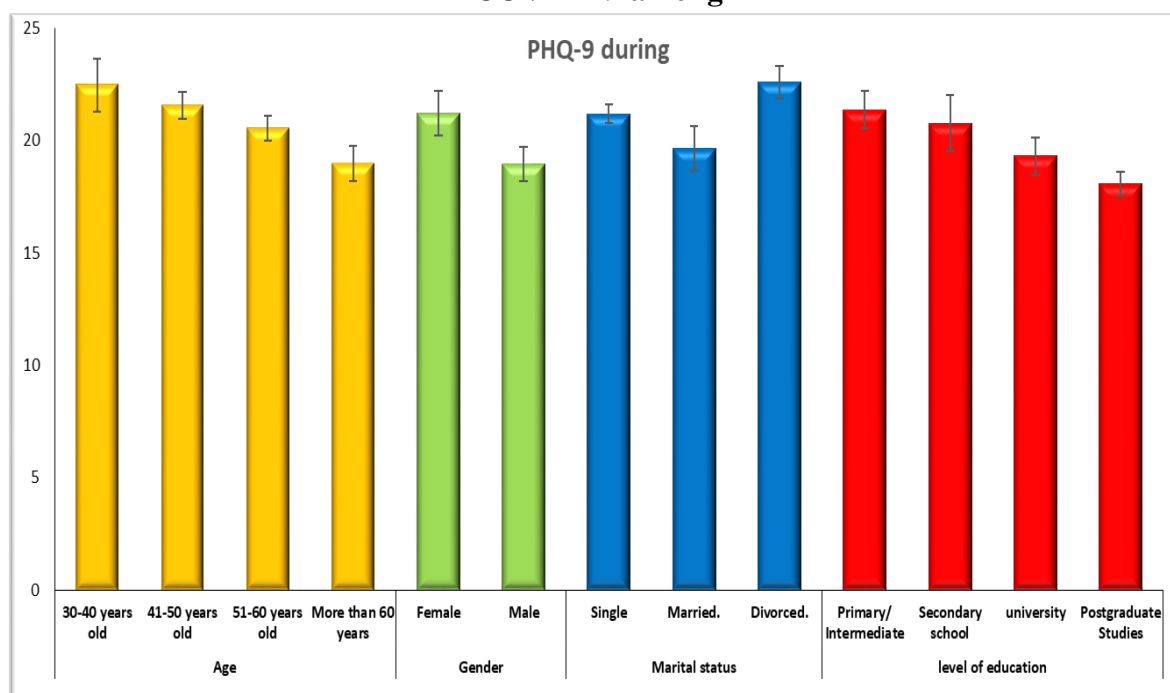
5. Discussion

The purpose of this study was to assess the Impact of COVID-19 virus on the obesity and depression on Population at Saudi Arabia in Makkah Al-Mukarramah.

the most of the participants (35.33%) were in the age group more than 60 years, the majority of them were female (66.0%), marital status most of participants married were(59.33%), the majority of participant are Primary/ Intermediate were(40.0%), most of participant have diabetes were(34.0%), Working/studying from home most of participants answer No were(84.67%). (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 [34].

This study found of depression symptoms in the in Saudi Arabia increased more than during the COVID-19 pandemic, from before COVID-19. To our knowledge, this is the first nationally representative study that assessed depression symptoms using the Patient Health Questionnaire–9 in in Saudi Arabia in Makkah Population before and during the COVID-19-pandemic.We found a shift in depression symptoms, with fewer people with no symptoms and more people with more symptoms during COVID-19 than before COVID-19. shows a significant positive higher levels of depression symptoms were observed during COVID-19 compared with before COVID-19 patients for each items in the score 2 and 3 were P-value=0.001 and also the total PHQ-9 (During COVID-19)a significant positive increase of depression symptoms were observed were P-value=0.001 and Range(17-24) while (Mean ±SD) were(20.444±.416)and Z(10.498).(see table 2)

We found similarly a 2020 study by Ni et al8 analyzed depression symptoms before and after political unrest in Hong Kong using the same measure of depression symptoms we deployed in this study[35]. They reported national depression symptoms prevalence before the unrest to be 6.5%(compared with 8.5%in our pre–COVID-19 US sample) and 11.2%in 2019 during unrest (compared with 27.8%in our during–COVID-19 sample). This suggests that the impact of COVID-19 on the US population may be substantially larger than that after other large-scale events. This may reflect the greater ubiquity of COVID-19 and its effects on the US population than prior recorded large-scale traumatic events. Our findings are consistent with studies in Asia showing a substantial burden of psychological distress following COVID-19.[36]

Also found similarly study confirms our results, as many of the participants (78.4%) reported changes in their sleep patterns. Female students were reported to be affected more severely with regards to their sleeping patterns and their psycho-emotional symptoms compared to males during the COVID-19 pandemic [37].

Our study revealed that the during studied period of the COVID-19 pandemic in Saudi Arabia, level BMI before and during COVID-19 Pandemic the changes in normal weight in before to become underweight during were(2.0%), also in the overweight before change to normal weight in during were(18.0%) , while obese class 1 before change to overweight during were(32.0%). Considering the BMI category during and before the pandemic, the total (during COVID-19 and before COVID-19)a significant positive increase of Wilcoxon Signed Ranks Test were P-value=0.001and Z(10.629) and while changed in before COVID-19 the

Range(23.3-32.7) While (Mean ±SD) were (28.625±2.061) to become during COVID-19 the range (17.7-31.7) . While (Mean ±SD) were (26.296±2.792). (see table 3)

We found similarly in anther study's the weight loss established in   positively associated with healthy eating changes. The vegetable intake is inversely related to the weight change over time and reduces the likelihood of abdominal obesity[38] another study weight loss. The decrease in body weight was positively correlated with the decrease in consumption of the so-called discretionary foods: confectionery, salty snacks, commercial pastry, fast food, and sugar-sweetened beverages. is a confirmed phenomenon, that reducing the consumption of those types of foods and replacing them, even partially, with healthy products leads to weight loss in people of all ages [39]. Similar findings were obtained by Pellegrini et al. [40], although their interventional study concerned obese adults that had undergone the educational program of body weight reduction with the Mediterranean diet implementation. Even though it seems that our finding is positive for public health, we noted, that many women who were underweight further decreased their body weight during the pandemic, which should be considered as a disadvantage. It should be underlined that underweight adults with influenza may be five times more likely to develop severe disease, and have an increased risk of hospitalization, regardless of viral pathogen status[41] .

In our study We found, results show a significant relation between the PHQ-9 about depression symptoms and age were F=140.516 and P-value=0.001, increase (30-40 years old the mean +SD were (22.467±1.187), also gender show a significant relation between the PHQ-9 about depression symptoms and gender were T=140.516 and P-value=0.001, increase(female), the mean +SD were (21.212±0.993). Regarding marital status show a significant relation between the PHQ-9 about depression symptoms and marital status were F=122.327 and P-value=0.001, increase (Divorced), the mean +SD were (22.583±0.717), regarding level of education show a significant relation between the PHQ-9 about depression symptoms and level of education were F=63.139 and P-value=0.001, increase(Primary/ Intermediate), the mean +SD were (21.367   ±0.823) (see table 4)

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[42]. An increased rate of depression and anxiety disorders has been described during the COVID-19 pandemic [43]. The anxiety/depression reported by our patients was strongly associated with weight gain and resulted in being the more relevant factor in predicting increase in body weight, after adjusting for consuming unhealthy foods. 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 [44]. 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 [45]. Finally, the consumption of unhealthy diets has been proposed to adversely impact on susceptibility to COVID-19 and recovery [46]. 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 [11]

6. Conclusion

Obesity might not directly cause depression in Population in Saudi Arabia, but other pathways and experiences may lead to depression indirectly. Also, stressful life events such as the Covid-19 Pandemic, isolation activities and community support and predispose to depression and may be a factor that leads to an increase in obesity during Covid-19 Pandemic, should emphasize on continuity of health services and ways of implementing innovative interventions to meet the health and socioeconomic needs of the population people to minimize the long-term consequences of the pandemic. Strategies to sustain behaviors positively adopted among population people has been critical to reduce the Obesity during spread of COVID-19

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