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Assessment of Impact of COVID-19 Virus on the Obesity and Depression on Population at Saudi Arabia in Makkah Al-Mukarramah 2021

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Abstract:

Background:

The coronavirus disease (COVID-19) is a highly transmittable and pathogenic viral infection caused by Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV-2), which emerges in December 2019 in Wuhan, China and spreads around the world at the beginning of 2020. The World Health Organization declares the outbreak a Public Health Emergency of International Concern on the 30th of January, and a pandemic on the 11th of March. On the 4th of March, the Saudi Arabia government orders the full closure of all schools and universities nationwide. Secondary Schools student are more likely to engage in risky health practices related to COVID-19. Their compliance with infection control measures is a key factor to mitigate the spread of the disease. Novel coronavirus-2019 is a highly infectious disease that caused a global pandemic around the world .Lack of knowledge about appropriate infection control practices has caused great concerns for human health, especially in the risk of many communicable diseases .and related to COVID-19). 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 2021. 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

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depression questionnaire)and the BMI category changes and weight changes during and before the COVID-19, our total participants were (300) . Results: Show that is a significant correlation between total PHQ-9 and COVID-19 were <0.001 during and before were Range during COVID-19 pandemic 17-24 and (Mean±SD) 21.676±3.416 while T 22.879 followed by before COVID-19 pandemic were Range before COVID-19 pandemic 6-18 and (Mean±SD) 12.055±2.559 Conclusion: Saudi Arabia can win the battle against the disease COVID-19, More emphasis should be placed on education of the Population participants about biological meaning of this infection and relative preventive or future measures. Awareness educational programs should be implemented toward preventive measures of COVID-19. 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.

Introduction

Coronavirus disease 2019 (officially known as SARS-CoV-2 or COVID-19) is an 2 emerging acute respiratory illness that is caused by a novel coronavirus and is first reported in December 2019 in Wuhan, Hubei Province, China, [1] from where it spread 4 rapidly to over 198 countries [2,]. In response to this serious situation, the World Health Organization (WHO) declares it a public health emergency of international concern on 30th of January and calls for collaborative efforts of all countries to prevent the rapid spread of COVID-19. It is declared as a global pandemic by WHO on 12th of 8 March [3,4].The sources of infection are patients with symptomatic COVID-19 and asymptomatic patients and patients who are carriers of SARS-CoV-2 [5] The incubation period for the virus is typically 2–14 days, and the period from the onset of symptoms to death was estimated to range from 6 to 41 days [6]
In Saudi Arabia, the principal COVID-19 case was accounted for on March 2, 2020 [7]. on 11 March 2020, WHO portrayed this epidemiological phenomenon as a worldwide pandemic.[8], the Gulf nations like Saudi Arabia, Qatar, United Arab Emirates and Kuwait detailed the most numbers of confirmed cases proportionally to the population size.[9]. 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,

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trailed by the capital of Riyadh and Jeddah and numerous different urban areas on April 6.[10]. 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.[11]. 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. [12]. 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.[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] 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. 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.[16] Ebola, MERS, and SARS pestilences all showed an effect on psychological wellness that incorporates sadness, and even substance misuse has been accounted for[17]. During the MERS flare-up in Jeddah, western Saudi Arabia, a study announced a critical relationship between the degree of anxiety and avoiding behaviors [18]
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.

Literature review:

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 [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

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(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].

[21] showed, on average, a similar tendency for both genders without specifying the women. The results of [22] 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 [23]. 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 [24]

[25], show 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.[25]

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 [26]. 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 [27].

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

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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 on Population at Saudi Arabia in Makkah Al-Mukarramah 2021.

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

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.

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3.3 Study population:

The researcher selected participants have obesity has been recruited from PHC centers in the Saudi Arabia. Including Al-Adl, Al-Zahir primary healthcare centers.

3.4 Study design:

A cross-sectional study has been conducted 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 February 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-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 (300) . 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 the researcher has been Permission from the regional Research and Ethical Committee and participants. The online survey has be disabled when the sample size is achieved, the primary participants has be requested to rollout the survey further.

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3.7 Study field :

Study has been conducted take place between 1/2/2021 to 1/42021.

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 ∼8 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 1/2/2021 to 1/4/2021

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

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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, **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.

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

Results:

Table 1 distribution of demographic characteristics of the research COVID-19 patients . (n=300)

	N	%
Age		
30-40	63	21
40-50	90	30
50-60	99	33
>60	48	16
Gender		
Female	174	58
Male	126	42
Marital status		
Single	90	30

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Married.	150	50
Divorced.	60	20
level of education		
Primary/ Intermediate	114	38
Secondary school	60	20
university	78	26
Postgraduate Studies	48	16
Chronic Medical conditions		
Asthma	66	22
Diabetes	96	32
Heart disease	57	19
High blood pressure	60	20
High cholesterol/Hyperlipidemia	21	7
Working/studying from home		
Yes	114	38
No	186	62

Table 1 shows that most of the participants (33.0%) were in the age group 50-60 years old year's follow by the (30.0%)were in the age 40-50 years, the majority of them were female (58.0%) while male(42.0%), regarding the marital status most of participants married were(50.0%) while single were(30.0%), regarding level of education the majority of participant are Primary/ Intermediate were(38.0%) while university school were(26.0%). Regarding the Chronic Medical conditions most of participant have diabetes were(32.0%) while high Asthma were(22.0%), regarding the Working/studying from home most of participants answer No were(62.0%)while answer Yes were(38.33%).

Table (2) Distribution Correlation between total PHQ-9 among COVID-19 before and during COVID-19 pandemic in participants

	Total PHQ-9		**Paired T-test**	
	Before	**During**	**t**	**P-value**
Range	6-18.	17-24	22.879	<0.001*
(Mean±SD)	12.055±2.559	21.676±3.416		

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Table (2) Show that is a significant correlation between total PHQ-9 and COVID-19 were <0.001 during and before were Range during COVID-19 pandemic 17-24 and (Mean±SD) 21.676±3.416 while T 22.879 followed by before COVID-19 pandemic were Range before COVID-19 pandemic 6-18 and (Mean±SD) 12.055±2.559

Figure (1) Distribution Correlation between total PHQ-9 among COVID-19 before and during COVID-19 pandemic in participants

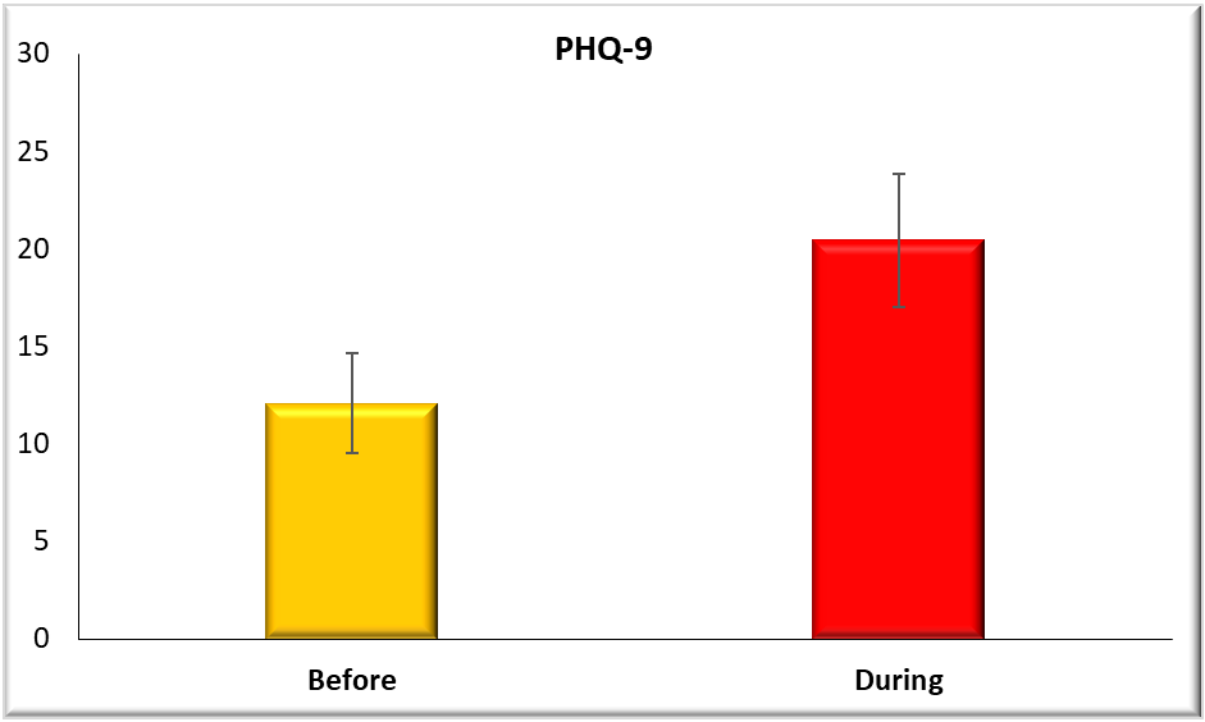

Table 3 distribution Correlation between the BMI category changes before and during COVID-19 pandemic in participants

	BMI		Paired T-test	
	Before	**During**	**t**	**P-value**
Range	19.57-32.7	20.55-42.118	42.088	<0.001*

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(Mean±SD)	25.877±3.57	33.144±4.591		

Table (3) Show that is a significant correlation between BMI category and COVID-19 were <0.001 during and before were Range during COVID-19 pandemic 20.55-42.118 and (Mean±SD) 33.144±4.591 while T 42.088 followed by before COVID-19 pandemic were Range before COVID-19 pandemic 19.57-32.7 and (Mean±SD) 25.877±3.57

Figure (2) Distribution Correlation between the BMI category changes before and during COVID-19 pandemic in participants

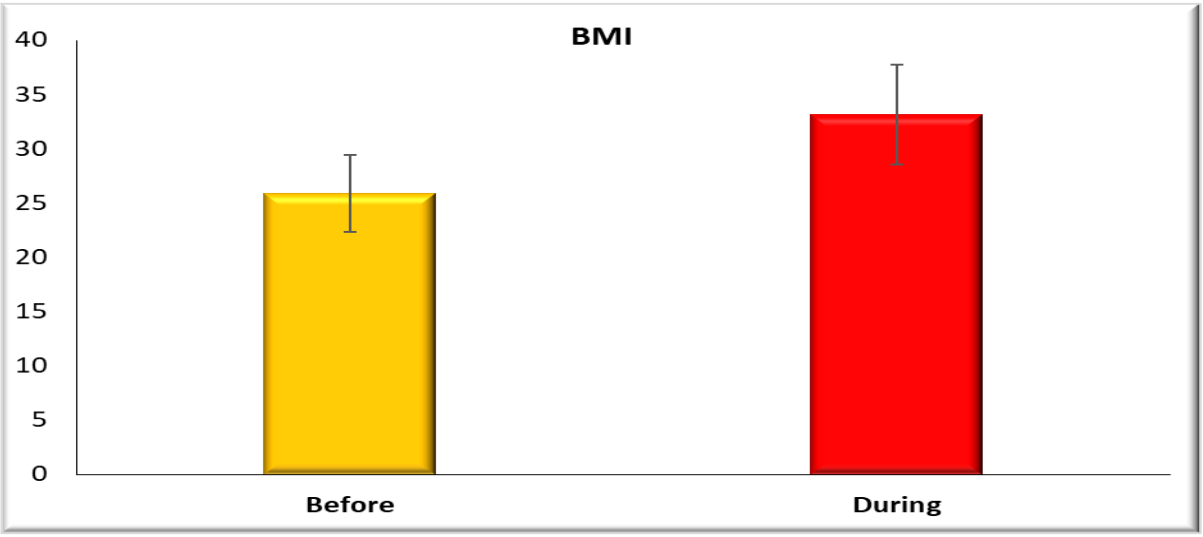

Table 4 Distribution the relation of socio-demographic data (Age, gender, marital status, level of education) and PHQ-9 about depression symptoms among COVID-19

		N	PHQ-9 during	F or T	ANOVA or T-test	
			Mean ± SD		Test value	P-value
Age	**30-40**	63	23.793 ± 1.498	F	64.081	<0.001*
	40-50	90	22.894 ± 0.914			
	50-60	99	21.882 ± 0.857			
	>60	48	20.307 ± 1.083			
Gender	**Female**	174	22.538 ± 1.304	T	16.027	<0.001*
	Male	126	20.267 ± 1.070			
Marital status	**Single**	90	22.520 ± 0.713	F	11.392	<0.001*
	Married.	150	20.979 ± 1.319			
	Divorced.	60	23.909 ± 1.028			

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level of education	**Primary/ Intermediate**	114	22.693 ± 1.134	F	45.338	<0.001*
	Secondary school	60	22.088 ± 1.557			
	university	78	20.632 ± 1.133			
	Postgraduate Studies	48	19.409 ± 0.826			

Table 4 and Regarding age, results show a significant relation between the PHQ-9 about depression symptoms and age were F=64.081 and P-value=0.001, increase(30-40 years old followed by from(40-50 years old), the mean +SD respectively were (23.793±1.49822 and 894±0.914), regarding gender show a significant relation between the PHQ-9 about depression symptoms and gender were T=16.027and P-value=0.001, increase(female), the mean +SD were (22.538±1.304). Regarding marital status show a significant relation between the PHQ-9 about depression symptoms and marital status were F=11.392 and P-value=0.001, increase(Divorced), the mean +SD were (23.909±1.028), regarding level of education show a significant relation between the PHQ-9 about depression symptoms and level of education were F=45.338 and P-value=0.001, increase(Primary/ Intermediate), the mean +SD were (22.693±1.134).

Figure (3) Distribution the relation of socio-demographic data (Age, gender, marital status, level of education) and PHQ-9 about depression symptoms among COVID-19

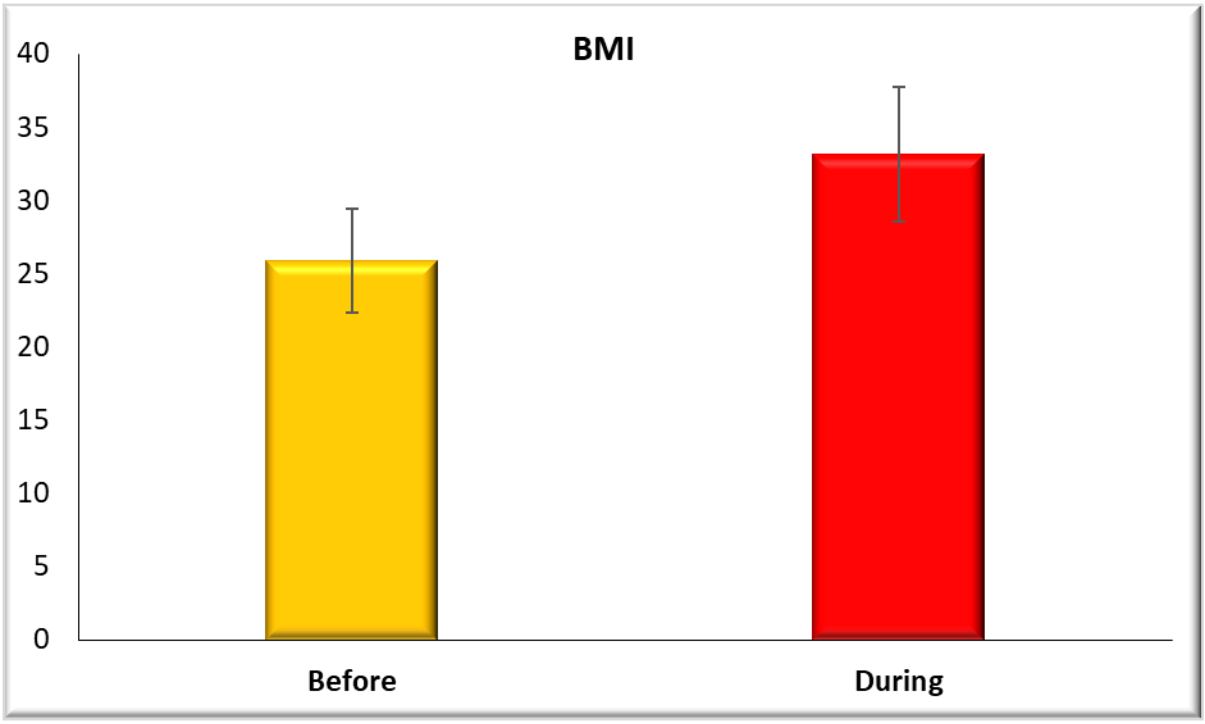

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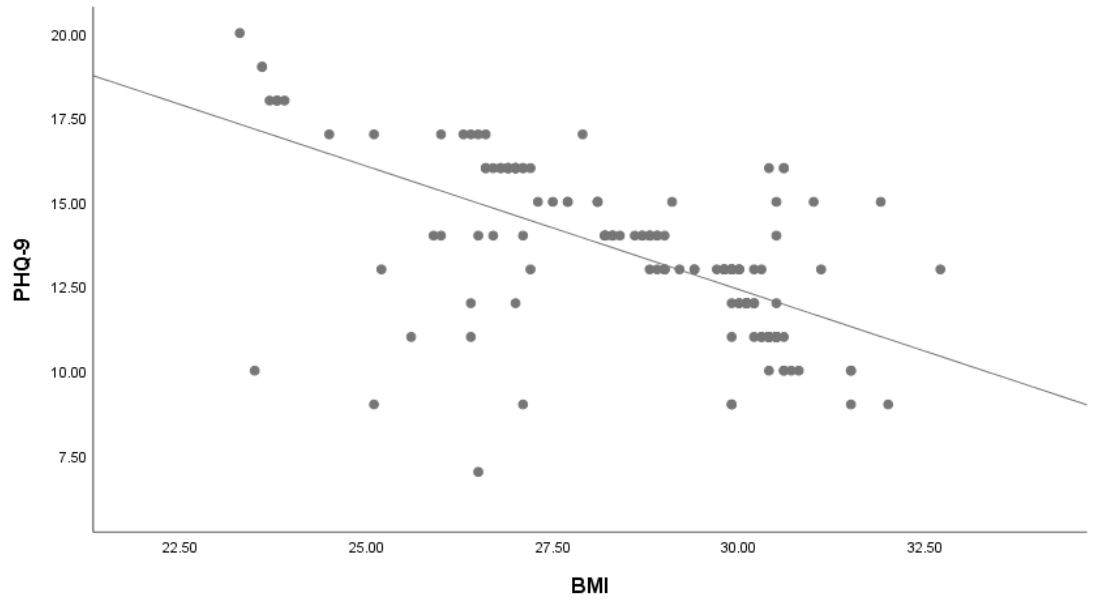
Table (5) Distribution the correlation between PHQ-9 and BMI

	BMI	
	r	**P-value**
PHQ-9	0.711	<0.001*

Table (4) Show that is a significant correlation between PHQ-9 and BMI were r= 0.711 And p-value =0.001

Figure (4) Correlation between PHQ-9 and BMI



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 shows that most of the participants (33.0%) were in the age group 50-60 years old year's follow by the (30.0%)were in the age 40-50 years, the majority of them were female (58.0%) while male(42.0%), regarding the marital status most of participants married were(50.0%) while single were(30.0%), regarding level of education the majority of participant are Primary/ Intermediate were(38.0%) while university school were(26.0%). Regarding the Chronic Medical conditions most of participant have diabetes

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were(32.0%) while high Asthma were(22.0%), regarding the Working/studying from home most of participants answer No were(62.0%)while answer Yes were(38.33%).. (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 [28]

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.(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[29]. 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.[30] 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 [31]

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 Show that is a significant correlation between BMI category and COVID-19 were <0.001 during and before were Range during COVID-19 pandemic 20.55-42.118 and (Mean±SD) 33.144±4.591 while T 42.088 followed by before COVID-19 pandemic were

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Range before COVID-19 pandemic 19.57-32.7 and (Mean±SD) 25.877±3.57 . (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[32] 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 [33]. Similar findings were obtained by Pellegrini et al. [34], 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.

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 [35]. Finally, the consumption of unhealthy diets has been proposed to adversely impact on susceptibility to COVID-19 and recovery [36]. 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 [37]

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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