Impact of Physical Inactivity and Pressure on Weight Gain During COVID-19 Pandemic Quarantine in Iraq

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Abstract: Aims: examine the factors that affect weight during quarantine such as physical activity and stress. Materials and methods: cross-sectional online survey study included people social demographic, individual behaviors, physical activity and stress level during COVID-19 quarantine among the Iraqi population, by using an online platform. Results: Out of the 661 participants, female 492(74.4%), age range was between 14-72 years old. Individual behaviors, 66% had irregular sleeping habit and 71% physically inactive. Besides, 72.8% lived under pressure. A high significant relation between weight gain and physical inactivity (p value: 0.01) and significant relation between stress and weight gain (p value: 0.038). Conclusions: physical inactivity and stress were risk factors for gaining weight during.

1. Introduction

Coronaviruses family is one of the viruses' family that share some distinct characteristics and disease symptoms. Some of them are known to cause pneumonia and other respiratory diseases, ranging from common cold to severe illness such as Middle East Respiratory Syndrome (MERS), Severe Acute Respiratory Syndrome (SARS), yet the most recently emerging member of this family is COVID-19, which causes respiratory infection. (Hafeez, et al, 2019). To reduce the spread of SARS-CoV-2 virus, many countries-imposed lock down in the cities that led the people to shift in their daily habits and the way of their lifestyle. Indeed, this included reduction in social interaction and prohibition for outdoor physical activity. The quarantine increased stress due toeconomic crisis, fear of social interaction and fear of being infected eventually triggeremotional and psychological stress (Mattioli, et al. 2020) (Abbas, et al., 2020). One of the quarantine consequences is altering individuals' lifestyle such as food craving, increase alcohol consumption and excessive smoking (Al-Musgharaf, 2020) (AlMughamis, et al, 2020). Studies have proposedthat same stress can either pose gluttony or drug addiction (Dallman, 2010). People who are isolated and go through economic crisis may practice unhealthy behavior and are more prone to health risk, especially when its combined with unfavorable lifestyles (Yu, et al., 2020) (Mattioli, et al.,2020) [a] (Mattioli, et al.,2020) [b]

Food cravings are strategies to escape stress during confinement, and this will increase macronutrient consumption, particularly carbohydrate, which promotes serotonin production that has a beneficial effect on mood (Bai et al., 2004).

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As a result, unhealthy meals like snacks, hamburgers, soda cola, and chocolate, as well as a lack of fresh fruits and vegetables, lead to obesity and health concerns (Muscogiuri, et al., 2020), (Mattioli, et al.,2020) c (Rodriguez and Meule, 2015) [a]nd (Rodriguez and Meule, 2015) [b]. According to Muscogiuri and colleagues long-term stress produced by quarantine, might cause sleep issues, which can lead to an increase in food cravings (Muscogiuri, et al., 2020). One of the main effects of Serotonine is to reduce Carbohydrates and fats intake and inhibiting of Neuropeptine Y, which plays a crucial role in the control satiety and energy intake. As a result, Muscogiuri and colleagues concluded that it is critical to ingest meals that promote tryptophan amino acid, which is a precursor of serotonin and melatonin synthesis ultimately induce sleep. Roots, leaves, fruits like bananas and cherries, seeds like almonds and oats, as well as milkand dairy products, all help you sleep. (Muscogiuri, et al., 2020) (Markwald, et al., 2013).

Limiting sleep, according to a comprehensive review trails and meta-analysis studies, can increase food intake and total energy expenditure while having an inconsistent impact on overall energy balance as a weight-loss procedure (Capers, *et al.*, 2015). Heracides and colleagues proposed that eating dairy products like yogurt could boost the function of natural killer cells and minimize the risk of infection of respiratory tract in order to enhance the immune system. This has the potential to improve protection against a variety of illnesses, including SARS-CoV-2 (Heraclides, *et al.*, 2021). Stress-related changes have an impact on the cardiovascular system as well as atherosclerotic process Staying home for long time (i.e. during quarantine) might have negative impact on vitamins level. Badimon and colleagues suggested consuming excessive amount of carbohydrate and fat prevent vitamins absorption (Badimon, *et al.*, 2010). Obesity constitutes high risk factor for cardiovascular disease, diabetes, and renal disease and remarkably on lung function. On the other hand, pro-inflammatory associate with malnutrition can lead to impaired immune response. It's worth mentioning that obese people will be more susceptible to COVID-19, which linked to modifications of leukocyte development (Bhsker and Greve, 2020). Particularly, obese people suffer impairment of CD8+ T cell responses to influenza virus infection. This is why obese individuals experience increased mortality incomparison with those who have normal weight (Bhsker and Greve, 2020) (Andersen, *et al.*, 2016) (Green and Beck, 2017).

The present study will briefly analyze the impact of quarantine on lifestyle, including eating habits, sleeping, stress level, physical activity and whether or not physical inactivity and pressure causes weight gain during quarantine.

2. Materials and Methods

After receiving approval by Ethics Committee at Hawler Medical University, College of Health Sciences to conduct this study, a web-survey was created to obtain data from every Iraqi reign. The survey included people eating habits and life- style during the COVID-19 pandemic quarantine. The survey was conducted from the 9th to the 20th of September 2020, among the Iraqi population, by using an online platform, accessible through any device with an Internet connection. The form was translated to two languages, the Kurdish form that distributed to local area, where people live in the north of Iraq and Arabic form that distributed to the rest of the population. The survey was distributed through institutional and private social networks (University email accounts, Facebook, Instagram, Viber and WhatsApp). This method was completely effectual for the research hypothesis, because it facilitated the wide distribution of the survey questionnaire during a period where, due to the pandemic, there are many restrictions for people physically contacted.

3. Study Questionnaire

The questionnaire was built by using Google Form. Forty eight questions divided into three sections: (1) personal data (10 questions: age, weight, height, gender, city, education level, current employment; economic situation, Marital status and number of children,); second section covered participants lifestyle before quarantine (14 questions included; cooking style, eating habits, physical activity level, smoking, working status before quarantine, sleeping habits, and Dieting), third section covered lifestyle during quarantine (22 questions that included if the participants were diagnosed with COVID19 or not, diet during quarantine, sleeping, exercise, stress, way of controlling stress and dietary intake information, which included list of food from carbohydrate (e.g. bread, and rice, deep fried food as in (e.g. fried egg plant, fried potato, KFC, etc.), red meat including (beef, lamb, and goat), white meat include (Turkey, chicken and fish), Dairy products, starchy food as in (potato, macaroni), fruits, vegetables, fresh juice, nuts and sweets. The platform nature does not allow tracing any sensitive personal information. All information where private and once completed, each questionnaire was transmitted to the Excel and the database was downloaded. Both Microsoft Excel and statistical product and service solutions (SPSS) were used.

4. Results

The study protocol and the subject information and consent form were reviewed and approved by a local ethics committee at Hawler Medical University, College of Health Sciences. Out of the 661 participants, the socio-demographic, personal and Daily habits data of the study sample.

Table 1: Sociodemographic data of the study sample

Variables	F	%
Gender		
Male	169	25.6
Female	492	74.4
Total	661	100
Age group		
14-28	243	36.8
29-43	297	44.9
44-57	104	15.7
68-72	17	2.6
		100
City		
North (Erbil, Sulaimanya, Dohuk, Mosul,Kirkuk)	401	60.2
Middle (Bagdad, Anbar, Wasit, Salahaddin, Babil)	243	36.8
South (Basra, Kwt, Najaf, Karbala, , Nasirya)	17	2
		100
Level of Education		
Read and Write	5	.8
Elementary	20	3.0
Secondary	9	1.4
High School	59	8.9

Bachelore degree	313	47.4
M.Sc.	147	22.2
Ph.D.	108	16.3
Total		100
Marital Status		
Single	288	43.6
Married	367	55.5
Divorced	3	.5
Widowed	3	.5
BMI		
Under weight	28	4.2
Normal weight	277	41.9
Over weight	265	40.1
Obese	86	13.0
Super obese	5	.8

Table (1) showed that the majority of participant's gender was female 492(74.4%) and male was 169(25. 6%). age range was between 14-72 years old. The highest percentage was in the age range (29-43), which was (44.9%). The majority of the population were from the north of Iraq 401(50.5%). For level of education of the study participants, the highest number were found in Bachelor degree313(47.4%), whereas the PhD. were 108(16.3%). The results showed that the majority of the women were married 376(55.5%) followed by single 288(43.6%). Finally, the results showed that the majority of the participants were normal weight 277(41.9%), where obese were 86(13%).

Table 2: Personal and Daily habits data of the study sample.

Variables	F	%
Smoking		
Smoker (Yes)	54	8.2
Non-Smoker (No)	607	91.8
Total	661	100.0
Sleeping habits regularity?		
Regular	224	33.9
Irregular	437	66.1
Total	661	100.0
Exercising during quarantine?		
Yes	192	29.0
No	469	71.0
Total	661	100.0
Follow a specific type of diet during quarantine		
Yes	279	42.2
No	382	57.8
Total	661	100.0

Table (2) illustrates some personal and daily habits of participants which have been witnessed during curfew period. One of which is smoking habit, in which a few of them (8.2%) were smokers and majority 607 (91.8%) were not smoking. Sleeping habit of the participant shifted dominantly with 66.1% who complained of irregularity in sleeping and only one third of them (33.9%) didn't have sleeping problems. Many of the participants 469 (71%) did not exercise and only 192 (29%) exercise regularly during quarantine period. Interestingly, 279 (42.2%) were following diet during quarantine time and 382 (57.8%) didn't follow any diet program.

Table 3: Feeling under pressure and financial concerns

Variables	F	%
Living under pressure during quarantine?		
Yes	481	72.8
No	180	27.2
Total	661	100.0
Financial concern (not able to work because of Quarantine)		
Yes	71	10.7
No	590	89.3
Total	661	100.0

Table (3) shows the the number of participants who underwent through pressure who counted three quarters of participantsmaking 481 (72.8%). Surprisingly, only 71 (10.7%) of them were struggling with financial problems and majority 590 (89.3%) of them did not feel concerns about it.

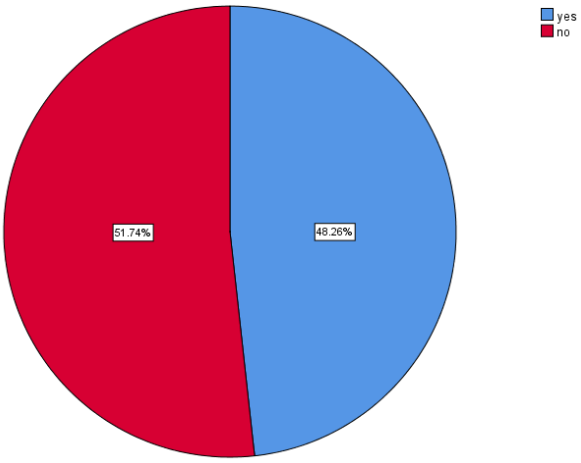

Figure 1: Pie chart shows percentage of participants who gained weight

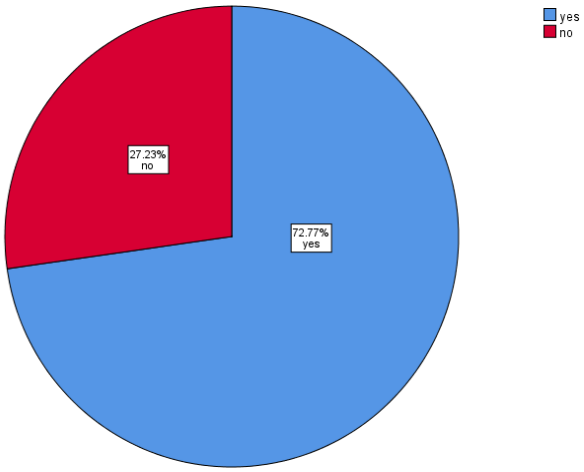

Figure 2: Pie chart illustrated participant who experienced pressure during quarantine

Table 4: Weight Gain correlation to exercising during quarantine

Correlatios				
			Did you gain weight during quarantine?	Did you keep exercise during quarantine?
Kendall'stau_b	Did you gain weight during quarantine?	CorrelationCoefficient	1.000	-0.118**
		Sig.(2-tailed)	.	0.002
		N	661	661
	Did you keep exercising during quarantine?	CorrelationCoefficient	-0.118**	1.000
		Sig.(2-tailed)	0.002	.
		N	661	661
**. Correlation is significant at the 0.01 level(2-tailed).				

Correlation r = 0.118 Direction= Negative Significance = .002 Very Highly SignificantCorrelationissignificant = 0.01

Table (4) is a Kendall tau association between weight gain and exercising which shows significant correlation between the two measured parameters with a value of 0.01.

Table 5: Weight Gain correlation to pressure experienced during quarantine

Correlantion				
			Did you gain weight during quarantine?	Did you live under pressure during quarantine?
Kendall'stau_b	Did you gain weight during quarantine?	Correlation Coefficient	1.000	.081*
		Sig.(2-tailed)	.	.038
		N	661	661
	Did you live under pressure duringquarantine ?	Correlation Coefficient	.081*	1.000
		Sig.(2-tailed)	.038	.
		N	661	661
*. Correlation is significant at the 0.05 level (2-tailed).				

Correlationr=0.081

Table 5- Is a Kendall tau association between weight gain and living under pressure. It shows a high concordance between weight gaining and dwelling under pressue with a correlation factor of 0.081 which is significant.

5. Discussion

Coronavirus is a very dangerous virus. and classified as a worldwide pandemic with a massive number of victims of infected people and deaths, Kurdistan Reign Government/ Iraq has enforced restrictions on outdoor activities on people in the north of Iraq from March 2020 to June 2020. A lot of changes happened during quarantine, e.g., food intake, sleeping hours, and physical activity level. All these mentioned changes and unhealthy nutritional habits may have contributed to excessive energy consumption leads to gaining weight and rising the likelihood of becoming obese. The presented study hypothesized that the quarantine may cause weight gain and other psychological changes.

In this study, nearly the entire participants mentioned that “they spent more time at home during quarantine than they did before the pandemic”, with nearly half declaring they spent nearly all of their home waking hours. As a result, the study's concept, expanded amount of time spent at home during lockdown, was confirmed.

Majority of first-survey respondents were women (74.4%), of younger age group of 29-43years (44%), married (55.5%), from North of Iraq (Erbil, Sulaimanya, Dohuk, Mosul, and Kirkuk) 60%, and well educated (47.4% with a bachelor’s degree, 22.2 have master degree and 16.3 have Ph. D degree)

Forty-eight percent of the participants stated that they gained weight, eighty- two percent gained weight between 1-5 kilograms and this result was higher than what recorded by (Sánchez Peña etal) and (Al-Musharaf, 2021) which was (53.9%) and (18%) respectively. AlMughamisetal, 2020 stated that eating behaviors triggered with multi-factors during quarantine such as; eating more often family,eating as a consequence of either the odour or sight of food, eating as a stress response, eating when bored.

Stress has been linked to increased eating and food cravings, particularly in young women. (Al-Musharaf, 2020), as well as elevated cortisol levels, which stimulate appetite and lead to weight gain (Bacaroetal, 2020). This study revealed that (72.77%) of participants where under pressure and the main causes of the pressure were: 30.64% were afraid to get Corona, 28.19% they afraid from unknown future, 19.12% complain from work or study online through home, 8.7% they had financial concern, 7.97% the complained from having big family and only 5.39% had trapped home. The percentage above supported by Alhusseini and Alqahtani study and Robinson and collegues research who found that because a high risk of weight gain during quarantine was linked with moderate stress, whether this exhibited before or after the quarantine or took place during lockdown (Alhusseini and Alqahtani, 2020) (Robinsin, et al., 2020). Studies reported that individuals who had been quarantined showed that there was a higher incidence of psychological disorders and clinical manifestations of disorders, such as emotional changes that occurred, depression, anxiety and stress (DiGiovanni et al., 2004) (Lee et al., 2005).

Participants in a done by (Robertson et al., 2004) reported worries concerning their own wellbeing or worry of infecting other peoples in the study and were much more prone to be anxious about infecting members of the family than those who were not quarantined. They became especially concerned if they complained of any physical symptoms that has relation to the infection (Bai et al., 2004) (Desclaux et al., 2017).

The major reason for weight gain during Spain's COVID-19 lockdown was a combination of many factors like excess food consuming and decreased physical activity. The Ministry of Agriculture, Fisheries, and Food of Spain realized that intake of wine, and other alcoholic beverages, as well as chocolate, sweets, snacks, and nuts, rose by more than fifty percent during confinement. (Sánchez et al., 2021) a, all of these products rich in calorie are probably attributed to, and even exceeded before COVID-19 energy consumption behavior (Sánchez et al., 2021) b.

During lockdown and isolation, people reduce their physical activity as well as their meditation (Mattioli et al., 2020). The present study showed that physical activity level significantly decreased during COVID-19 lockdown and that 71% of the participant not exercising during lockdown and this correspond with a study done in Israel, that 70% Of the participants, reported that their exercise decreased, while 63% reported exercising three times a week or less, and this decrease in physical activity correlated to increased weight (54.8%) (Dor-Haim et al., 2021).

Data collected by Tison and collegues watches that from over 30 million active users around the world showed a decrease in physical activity of Spain, North America and Israel, 38%, 14% and 24%, respectively (Tison et al., 2020). It assumed that the closure resulted in a reduction in physical activity below the minimum recommendations of health organizations also supported by (Bai et al., 2004). It's been established that the combined effect of infrequent physical activity and prolonged lack of activity tends to promote adverse health shifts (Lippi et al., 2020).

6. Conclusions

In our information, this is the first study the impact of COVID-19-related home confinement on weight changes, eating patterns, and physical activity levels in a large sample of Iraqi adults' population group.

In general, quarantine had a negative impact based on weight of the body, dietary patterns, and physical activity levels, according to this study.

7. Recommendation

People who are quarantined and have relatively low family income, as well as those who lose earnings while quarantined, may require additional levels of help and support. Financial reimbursements should be made available where possible, and a plan should be designed to provide financial assistance during the lockdown time. Employers may need to think about practical approach that make it possible employees to feel comfortable if they so desire to work from home to avoid financial loss and to minimize its impact of financial problems, while keeping in mind that workers in these situations might not be at their most productive and may advantage more from distant social protection from their colleagues.

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