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## Self-quarantine and weight gain due to dietary intake and related risk factors during the COVID-19 pandemic

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Novel coronavirus or 2019-nCoV) disease (COVID-19) outbreak is occur in one of the most chief health problems worldwide. WHO stated that COVID- 19 is the sixth Public health disaster of global concern involved more than 300 countries .COVID-19 was found to cause a severe type acute respiratory syndrome (ARDS), which is similar to that caused by bat-SL-CoVZC45 and bat-CoVZXC21 corona viruses. It has been reported by World health organization that around 3,848,683 confirmed reported cases with 30,980,21 deaths were declared from at least 260 countries well confirmed cases have been diagnosed in number of countries and regions all over the world, most of them was in China. Precautions and preventive measures are best known method. Social distancing and self-quarantine were advised to smoothen the epidemic curve in the hope of restraining the effects the coronavirus may have had on human health. Ministry has advised that all the schools, universities, social palaces, and any non-essential business to be close till further instruction. These measures were put into place to prompt self-quarantine. The influence of self-quarantine on factors that impact weight change and obesity-related behaviors in adults is unknown. The aim of this study is to determine the self-quarantine impacts on human behaviors associated with weight gain and anxiety or depression during the pandemic.

**Keywords:** Quarantine, Weight gain, Pandemic, COVID-19

### INTRODUCTION

#### Literature Review

Pandemic COVID- 19 happen regarding as one of most aggressive outbreak occur in three close decades with uncommon viral pneumonia started in Whuhan , China and then globally. WHO declared a national emergency along with ministry of Saudi Arabia declaring it as a state emergency

and directed to closed the university and all educational institute till any further declaration. Preventive measure include wearing mask, not to shake hand , Use of hand sensitizer , gloves and keep social distancing of approximately 1 meter. Since 2019 till now school are closed and online education by blackboard or Microsoft team has announced to be used. The influence of self-

quarantine on human have some negative effects including the more weight gain than during school year (Rundle A.G et al 2020.)

The virus causing COVID-19 can be transmitted via droplets of infected person or through direct contact with the infected person. After the initial infection the virus incubate for 6.4 to 7 days for reproduction then the evolution can occur. The most common symptoms associated with virus progression are headache fever pneumonia, and body ach, then followed by cough. Applying computed tomography images, the chest usually show involvement of both respiratory system together with ground-glass opacity on X ray.

Patients suffering from Covid-19 presented with many symptoms include fever, dry cough and shortness breathing. In most advance pneumonia and severe respiratory syndrome and even death can occur. Labrotarotory diagnosis of COVID- 19 basically build on molecular method PCR (real time PCR) the sample is from repirotory (throat swab, nasopharygeal swab, sputum, endotracheal aspiration and bronchoalvoelar lavage), in severe cases stool and blood will be positive for viruses (Huang, et al. 2020). Once the individual is diagnosed to be COVID-19 positive, it is recommended to be self-quarantine himself for at least 14 days till the symptoms resolve and recovery has noticed. Management of patient with COVID- 19 is different in case of mild clinical presentation may not need hospitalization and at home management is enough. Although the decision of monitor patient in the hospital or outpatient should made on every case separately. A recently published study reported that during the self-quarantine 45 students has noticed alteration in sleep pattern and eating behaviors' in a manner that it would lead to raised BMI during this period( Pietrobelli A et al.2020). In another study stated that mice retained in single or private cage grown fatter in paralleled to mice lived in groups (Nonogaki K et al.2007). Häfner S. in his study in 2011 stated that there is increased serum leptin level has noticed due to social isolation. Thus, the duration of living at home in isolation or sedentary life of people within a home may also impact on increased BMI during self-quarantine.

### **Purpose of study**

Aim of this study is to evaluate the self-quarantine impact on human behavior and also to know the dietary factors resulted in weight gain during the pandemic Study will help in detection of self-quarantine effects on human in Saudi Arabia

Study will have significant implication in preventing from developing long term effects coffee intake and dietary habits during the pandemic and help them in life style modification leading to healthy life. Our study will contribute to healthier nutritional recommendations and guidance for healthy life style interventions during the pandemic. The outcome of this research will help to direct and improve prevention and management of COVID-2019. The research will help to enhance concept hypothesis of prevention, and even behavior change during the COVID-2019 which can reduce burden of intensive and complicated COVID-2019 disease management.

### **MATERIALS AND METHODS**

#### **-Study Design; A Cross Sectional study**

The study will be carried out among medical and dentistry students at Hail University, KSA.

The data collection will be through online questionnaire. Duration of the study was from September 4<sup>th</sup> 2020 to janurary 17<sup>th</sup> 2021. The study population was Human subject living in hail region aged between 20 to 60 years. Sampling technique: Non-probability, convenience sampling. Informed written consent was taken from the participants. All the data was kept confidential and was used only for research purposes. The comprehensive results of the history and physical test was reported on the questionnaire accepted by the ethical committee. There will be pre-tested structure questionnaire.

#### **Sample collection and processing**

Random sampling technique will be used by a questionnaire explaining the research idea to be filled by medical and dentistry students at Hail University.

#### **Statistical Analysis**

Data was obtained and analyzed by (SPSS, version 22) statistical program and the significance at P-value < 0.05.

### **RESULTS**

More than half of the respondents were between 18-29 years of age (55.2%) and were females (59.1%). Most of the respondents were graduates (55%) and (57.2%) were retired. About one-third of the respondents were married (35.1%). More than half of the respondents were currently living in Hail (59.9%). Only 10.5% of respondents were cigarette and shisha (Hookah) smokers (Table 1)

**Table-1: Basic profile of respondents**

Demographic profile	No. (n=358)	%
<b>Nationality</b>		
Saudi	339	94.7
Non-Saudi	19	5.3
<b>Age in years</b>		
Less than 18	57	15.9
18 – 24	124	34.6
25-34	42	11.7
35-44	60	16.8
45-54	65	18.2
55-64	10	2.8
65-74	0	0
<b>Gender</b>		
Male	100	29.9
Female	235	70.1
<b>Education</b>		
Primary	8	2.2
Secondary	29	8.1
High school	68	19
College degree	231	64.5

**Table : 2**

<b>Have you been sick with novel coronavirus/COVID-19?</b>		
Yes, tested.	29	8.1
Yes, but not yet tested	6	1.7
No	305	85.2
Don't know	18	5
<b>Do you know in your immediate social network anyone sick with novel coronavirus/COVID-19?</b>		
Yes	231	64.5
No	100	27.9
Don't know	27	7.5
<b>Duration of time spent indoors :</b>		
8-12 hours	49	13.7
12-16 hours	48	13.4
16-20 hours	62	17.3
20-24 hours	199	55.6

**Table 3: Coffee intake table of finding among study group**

Participants were asked to report how many hours they spend inside their homes each day. The majority (55.6%) of the participants spent between 20–24 hours per day inside their home , were (17.3%) Of the participants spent between 16-20 hours per day inside their home , and (13.4%) spent between 12-16 hours per day inside their home , while the remaining (13.7%) spent between 8-12 hours per day inside their home.

The participants were asked about the amount of caffeinated beverages they drink daily during self-quarantine. The majority of the participants (40.2%) drink 2-3 caffeinated beverages daily, (38.4%) drink 1 caffeinated beverages daily,(15.4%) drink 4-5 caffeinated beverages daily, while the remaining (6.1%) drink 6 or more caffeinated beverages daily during self-quarantine. Also the participants were asked if the amount they were drinking differ from the amount they were drinking before self-quarantine. More than have of the participants (55.9%) reported no change in the amount, while (33.2%) of the them reported increasing in the amount and (10.9%) of them reported decreasing in the amount. The participants were asked if the increased their amount of caffeinated beverages when the stressed or when they feel some anxiety . The majority of the participants (70.4%) reported no , while (29.6%) reported yes for the

Eating behaviors Table 1 details eating behaviors during self-quarantine. Roughly 23% stated that during self-quarantine they "eat more often with friends and family-Increased a large amount, 22% stated they increased "eating when bored-Increased a large amount , " 17% stated they increased "eating in response to sight and smell of food Increased a large amount," 15% stated they increased "eating because they crave certain foods Increased a large amount," 14% said they "Overeating at dinner Increased a large amount,11% " Eating when depressed or upset Increased a large amount " , 10% stated they increased Overeating at lunch " , 8% " Eating when angry Increased a large amount" ,6% stated they increased "eating in response to stress and anxious , 5% stated they increased" Overeating at breakfast "

The participants were asked about the time spent on playing video games, about half of the participants chose none (44.3%) were others chose more than 3 hours (17.3%), and (16.2) chose less than hour , and (14.6) chose 1 to 2 hours, (7.8%)chose 2 to 3 hours.

Amount of caffeinated beverages	No. (n=385)	%
1	137	38.4
2-3	144	40.2
4-5	55	15.4
6 or more	22	6.1
<b>Difference in the amount before self-quarantine</b>		
No change	200	55.9
Yes increase	119	33.2
Yes decrease	39	10.9
<b>The amount of caffeinated beverages increases in response to stress</b>		
Yes	106	29.6
No	252	70.4

**Table 4 : Eating behavior during the Pandemic Covid-19 among study group.**

Eating behaviors	Has not increased at all	Increased a small amount	increased a moderate amount	-Increased a large amount
Eating when stressed	(63.7%)	(19.8%)	(10.9%)	(5.6%)
Eating when angry	(67.3%)	(15.1%)	(10.1%)	(7.5%)
Eating when anxious	(63.1%)	(19.6%)	(10.9%)	(6.4%)
Eating when bored	(34.4%)	(26.3%)	17%	(22.3%)
Overeating at lunch	(57.3%)	(21.5%)	(11.5%)	(9.8%)
Overeating at breakfast	(66.5%)	(17.3%)	(10.9%)	(5.3%)
Overeating at dinner	(44.1%)	(19.8%)	(22.1%)	14%
Eating because I crave certain foods	(22.9%)	(37.4%)	(24.3%)	(15.4%)
Eating when depressed or upset	(58.4%)	(20.4%)	(10.1%)	(11.2%)
Eating with friends and family	24%	(26.5%)	(26.5%)	(22.9%)
Eating in response to sight and smell of food	(34.6%)	(31.6%)	(17.3%)	(16.5%)

**Table 5: SIT-Q**

	n=358		n-%			
	None	Less than hour	1-2 hours	2-3 hours	More than 3 hours	
Time spent on playing video games	158 44.3%	58 16.2%	52 14.6%	28 7.8%	62 17.3%	
Time spent on using smart phones	6 -	7 2%	21 5.9%	49 13.7%	275 76.8%	
Time spent on tv	58 16.2%	54 15.1%	94 26.3%	63 17.6%	89 24.9%	
Time spent on eating	<b>1-10 minutes</b>	<b>10-20 minutes</b>	<b>20-30 minutes</b>	<b>30-45 minutes</b>	<b>45m-1hour</b>	<b>More than hour</b>
	46 12.9%	110 30.7%	91 25.5%	35 9.8%	41 11.5%	35 9.8%
Time spent on sleeping	<b>Less than 3 hours</b>	<b>4-5 hours</b>	<b>6-7 hours</b>	<b>8-9 hours</b>	<b>More than 9 hours</b>	
	10 2.8%	36 10.1%	100 28%	100 28%	112 31.3%	

**Table 6 :PROTECTIVE MEASURES**

n=358	Yes	%	No	%
<b>Protective measures</b>				
Avoid traveling	326	91.1%	32	8.9%
Hand washing	347	96.9%	11	3.1%
Using disinfectants	339	94%	19	6%
Avoid touching eyes, nose, and mouth with unwashed hands	330	91.9%	28	7.6%
Avoid eating at a restaurant	245	68.4%	113	31.6%
Staying at home when sick	347	96.9%	11	3.1%
Covering the face when cough or sneeze	346	96.6%	12	3.4%
Avoiding close contact with someone who is sick	345	96.4%	13	3.6%
Taking herbal supplements	159	44.4%	199	55.5%
Exercising regularly	178	49.7%	180	50.3%
Eating a balanced diet	184	51.4%	174	46.6%
Wearing a face mask	340	95%	18	5%
Using hand sanitizer	347	96.9%	11	3.1%
Social distancing	330	92.2%	28	7.8%

Participants were asked about time they spent on using their phones, the majority (76.8%) chose more than 3 hours, (13.7%) chose 2 to 3 hours, and (5.9%) chose 1 to 2 hours, (2%) chose less than hour.

(26.3%) of the participants reported that they are spending 1- 2 hours watching tv per day, and (24.9) chose more than 3 hours, (17.6%) chose 2 to 3 hours, (16.2) of participants chose none, and (15.1%) chose less than hour.

Participants were asked about time spent on eating meals, (30.7%) chose 10 to 20 minutes, and (25.5%) chose 20 to 30 minutes, (12.9%) spent 1 to 10 minutes, and (11.5%) chose 45 minutes to 1hour, (9.8) of the participants chose more than hour.

(31.3%) reported that they are sleeping more than 9 hours, and (28%) chose 8 to 9 hours, (10.1%) of the participants spent 4 to 5 hours, and (2.8%) chose less than 3 hours.

The participants were asked about the awareness of the protective measures against COVID-19

(91.1%) of the participants avoided traveling and (8.9%) did not. (96.9%) of the participants washed their hands carefully and (3.1%) did not. (94%) used disinfectants, while (6%) did not. (91.9%) of the participants avoided touching their eyes, nose and mouth with unwashed hands and (7.6%) didn't.

(68.4%) avoided eating at a restaurant and (31.6%) didn't. (96.9%) stayed at home when they got sick and (3.1%) didn't. (96.6%) covered their faces when they cough or sneeze and (3.4%) didn't. (96.4%) avoided close contact with someone who is sick and (3.6%) didn't. (55.5%) didn't take herbal supplements and (44.4%) did.

(50.3%) avoided exercising, while (49.7%) exercise regularly. (51.4%) followed a balanced diet and (46.6%) didn't. (95%) of the participants used face masks and (5%) didn't. (96.9%) used hand sanitizer and (3.1%) didn't. (92.2%) kept social distancing and (7.8%) didn't

## DISCUSSION

In our research most of the responses come from female and university educated, in other studies in USA and in Poland female are also more responsive [Zachary Z, et al. 2020], and the age group from 18 to 34 was the most responsive age group. Participants were asked to report how many hours they spend inside their home each day majority of them report they spend more time at home during quarantine, in other studies in USA, participants also report that they were spend more time at home during the quarantine [Sidor A, Rzymiski P. 2020]. Accordingly, the presumption for the study, increased time at home during self-quarantine, was validated.

About the caffeine intake the participants were asked about the amount of caffeinated beverages they drink daily during self-quarantine, in our research the majority of them drink 2-3 caffeinated beverages daily, while 38.4% drink 1 caffeinated beverages daily, and the remaining of the participants drink more than 4 caffeinated beverages daily. The effects of coffee or caffeine on the human body has passed through several stages where it provided both negative as well as positive health effects on human. In a study among students of UK universities indicated there are a massive amount of students who consume caffeine on daily basis and almost 27% of them are consumers of almost 2 cups of coffee and 17% consume almost 6 cups of coffee on daily basis.

The findings of this research also indicate that increased consumption of caffeine among students leads to sleep disorder and thus entire mental health is disturbed. Therefore, the researchers and health experts have suggested reduced consumption of caffeine among the students[4]. We also ask the participants if the amount of caffeinated beverages they consume before self-quarantine differs from the amount during self-quarantine and majority of the participants reported no difference in the amount so in our research we found that there is no relationship between increase caffeine intakes and self-quarantine. About the stress and its effects on increase caffeine intake most of the participants report that stress doesn't increase their consumption of caffeine. Previous studies also reported similar findings (Aslam et al., 2013; Buxton & Hagan, 2012; Ishak, Ugochukwu, Bagot, Khalili, & Zaky, 2012). From our point of view, males usually tend to get involved in more risks, physical activity, and careless behavior than did females (Higgins et al., 2010). Similar to a previous study, the frequency of energy drink consumption was higher in unmarried students, probably due to the fact that they are younger and involved in a higher level of risk-taking (Alabbad et al. 2019)

Within the current study, almost the entire sample stated they 23% stated that during self-quarantine they "eat more often with friends and family-Increased a large amount, 22% stated they increased "eating when bored-Increased a large amount .17% Increased eating in response to sight and smell during quarantine could be considered a component of the psychological variables impulsivity and disinhibition. Impulsivity is a hasty reaction to an outside stimulus without concern for negative consequences and has been linked with binge eating[ Whiteside U et al. 2007] Prior research shows that when subjects are provided with large portions of food for many days, they will consistently overeat even though they report decreased hunger and increased satiety [Zakout et al. 2020] .

For sedentary lifestyle questions, majority of participants (31.3%) slept over 9 hours during self-quarantine. (76.8%) spent more than 3 hours using their phones daily.(17.6%) spent more than 3 hours watching tv during self-quarantine. And (17.3%) of participants spent more than 3 hours on playing video games.

For protective measures against Covid-19, participants were asked about the awareness about personal protection against COVID-19. The most common personal protection practices

adopted by participants are hand washing, using hand sanitizer, Staying at home when sick were(96.9%), covering the face when cough or sneeze(96.6%), Avoiding close contact with someone who is sick (96.4%). In other research in south- west Saudi Arabia, the most protective practices are washing hands (92.7%), social distancing (92.3%), using a face mask (86.5%), and avoiding travel to infected areas or countries (86.9%) [Awdah Al-Hazimi et al.2020].

## CONCLUSION

The present study sheds light on the current level of perception awareness regarding Pandemic COVID 19, including knowledge, preventative measures, and Adherence to protective measures in the Hail region of Saudi Arabia.The results of this study indicated that the majority of respondents were aware about preventive measures and well prepared and frustrated due to self-quarantine during COVID19. It was manifest that the community's overall behavior towards COVID-19 during self-quarantine were directed towards increase intake e of coffee and weight gain due to various reasons but their preparedness were fairly satisfactory. However, there were stress and anxiety level are shown to increased due to few misconceptions regarding the mode of COVID-19 transmission among the participants, which need to be further addressed.

In order to reduce the anxiety and fear during the Pandemic COVID-19, it would also be worthwhile to focus towards exercise and health dietary habits among the population and to take some advance measure in various COVID-19 prevention efforts, including health education and innovative strategies to raise the community's awareness and to improve its preventative practices during Pandemic situation.

## CONFLICT OF INTEREST

The authors declared that present study was performed in absence of any conflict of interest.

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## AUTHOR CONTRIBUTIONS

FK and ZB contributed Literature search and finalized the manuscript and wrote the manuscript. WNA ,EWN YAA ,LZA , and STO help in data collection, and data analysis. SMHA and MRM reviewed the manuscript. All authors read and

approved the final version.

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