Original Article

Frequency of Weight Gain and its Impact in Adults during Lockdown: A Cross-Sectional Study

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Abstract

Objectives: The current lockdown in the country has led to a sedentary lifestyle because of a shift of daily activities online and a fear of contracting the illness leading to isolation inside homes; Hence an expected change in weight of the general population. This study aims to determine the frequency of weight gain and its impact in adults during the current lockdown of COVID-19.

Methods: Participants selected from the ages of 18-25 from different universities of Pakistan were sent questionnaires via WhatsApp, posted online using Microsoft Forms. A total of 157 responses were attained.

Results: Among the 157 participants the average weight before the lockdown was 61.95 kgs and after the lockdown was 64.99kgs so there was an increase of 3.016 kgs whereas 18.5% of the sample maintained their weight and 37.6% were reported to have lost weight. The results also depict a 1.6% increase in impairment of body image.

Conclusion: We concluded that the Lockdown due to the COVID-19 pandemic has caused a gain in the weight and lowered self-esteem with regard to body image of most young adults in Pakistan due to many factors including higher food intake, lack of exercise and also emotional distress.

Key words: Obesity, Weight gain, Lockdown, Body Image.

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Introduction

On March 11, 2020 WHO Director General declared COVID-19 a global pandemic, the first ever pandemic caused by the coronavirus species.¹ As governments, started to lockdown there countries, the stress and anxiety among the populations raised, as Brooks et al. found in their review a positive correlation of increased mental health problems during this pandemic. The factors leading to this rise include the long duration of isolation, fear of infection, inadequate

supplies, boredom and frustration surrounding financial situations due increasing unemployment.² The article published by Zachery et al. May 2020, found that 22% of the subjects gained 5–10 pounds during self-isolation as they spent 20-24hrs inside the house.³ Furthermore, this study also found that a significantly higher percentage of people that gained weight were eating in response to stress or snacking after dinner.³

As the uncertainty surrounding and duration of the pandemic increases, people tend to make unhealthier lifestyle choices. People tend to choose foods with longer shelf life that are highly processed and rich in calories.⁴ This not only affects adults but also children. As schools, workplaces and gyms closed down, opportunities for physical activity also declined. Furthermore, people also have an unhealthier sleeping pattern during holidays. All of these factors i.e. unhealthy diet, lack of physical activity and poor sleeping habits lead to a heightened risk of obesity.³

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As it is well known, obesity is linked to heightened morbidity and mortality. Obesity causes a low-grade systemic inflammation that leads to the development of metabolic dysfunction.⁵ According to Bary et al. dysfunctional subcutaneous fat deposition lead to increased free fatty acids and decreases triglycerides which in turn causes ectopic fat deposition. This lipid deposition in various systems of the body lead to cardiovascular disease, diabetes mellitus and dyslipidemia. On the other hand there is increase in cytokines release and angiotensin which causes hypertension.⁶ Furthermore, there is an increased risk of breast cancer, endometrial cancer and other forms of cancer.⁷⁻⁹ Obesity also modifies the immune responses of the body, making the immune system more vulnerable to infections and less responsive to vaccinations, antivirals and antimicrobial therapies.¹⁰ It has with higher incidences of respiratory tract infections as well as rhinitis, sinusitis and pharyngitis/laryngitis in obese individuals.¹¹ A greater incidence of bronchitis, pneumonia and influenza like illness has also been reported in obese individuals.¹²⁻¹⁴ In addition, according to Lee et al. and Delvin et al. there is a rise in mental health problems as obese people are more prone to weight based bullying, body image issues, depression and eating disorders.^{15,16} Keeping in view all these factors, this study was aimed to determine frequency of weight gain and its impact in adults during the current lockdown of COVID-19.

Methods

After approval by the ethical committee of CMH LMC & IOD, participants both male and female, age group of 18-25years, belonging to different universities of Pakistan were offered to be enrolled in the study. The sample size was calculated to be 157 using the Rao soft formula with 95%confidence interval and 5%margin error. The population size used was calculated by using values of Zachary et al.²

Questionnaires' were administered online using Microsoft Forms by sending the link for the form to WhatsApp groups. The questionnaires were adapted using Impact of Weight on Quality of Life (IWQOL)¹⁷ and Body Image Questionnaire (BIQ).¹⁸ The questions designed included questions from four areas: physical function, self-esteem, public distress and body image, respectively. Question 1 to 6 collected biodata of the participants. Question 7-16 were adapted from the IWQOL. Each question was rated on a

three-point Likert scale with 'Never' scoring 0 points, 'Sometimes' scoring 3 points and 'All the time' scoring 5 points. The scores are additive and higher scores mean lower impact of weight gain on physical function, self-esteem, public distress. Question 17 - 21 were adapted from the Body Image Questionnaire (BIQ).¹⁸ This part consist of 5 questions related to body image. Each item for this part was scored from 1 i.e., impaired to 5 i.e., most impaired. The total score was achieved by summing all scores. The total scores ranged from 6-30 with a higher score reflecting greater impairment of body image. All data was analyzed using SPSS software (version 26; IBM). Results were presented in frequency and percentages. Chi- square test was used for comparison of categorical variables. P value <0.05 was statistically significant.

Results

One hundred and fifty-seven people completed the survey of which 109 were females and 48 males. The average weight before lockdown was 61.95 kgs and after lock down was 64.966 kgs, an increase of 3.016 kgs. Stable weight was maintained by 18.5 % of the sample while 37.6 %and 11.5 % reported to have gained less than 5 kilograms and more than 5 kilograms respectively. This data is presented in **Figure 1**.

Figure 1: Change in Weight by Percentage of Population

The average score for part 1 of the survey assessing quality of life was 12.185 before lockdown and 12.86 after lockdown (**Table 1**). The increase in this score shows that the overall quality of life worsened during lockdown however this difference is not significantly high. As represented by **Table 1**, physical function declined in two variables, trouble with moderate exercise i.e., trouble climbing stairs/running with a P-

value of 0.033 and trouble with stiff joints i.e. I am troubled by painful or stiff joints with a P-value of 0.002. The area of self-esteem also showed significant p-values for the variables 'Because of my weight, I am afraid of being rejected' and 'Because of my weight, I avoid looking in mirrors or seeing myself in photographs' with p-values of 0.04 and 0.033 respectively. The P-value was also significant for the variable concerning the area of work i.e. trouble getting things accomplished or meeting my responsibilities (0.02). The average score for part 2 of the survey assessing impairment in body image was 12.796 before lock-down and 13.701 after lockdown (**Table 1**). This demonstrates that there has been an increase in the likelihood of impaired body image. Assessment of impairment of body image demonstrate an

Table 1: Scores and Standard Deviation for Assessment of Quality of Life and body Image

	Assessment of quality of life		Assessment of body image	
	Mean	Std	Mean	Std
Average Score				
Before lockdown	12.1847	3.2420	12.7962	4.0884
After lockdown	12.8599	3.8886	13.7006	4.8417

increased impairment in some variables.

Table 2 represents the variables with significant p-values when populations were compared according to their change in weight. People were significantly self-conscious because of their weight after lockdown with a p-value of 0.026. Experience of being ridiculed, teased, or receiving unwanted attention increased in population with gain in weight, while it declined in those that lost weight(0.06).

For the area of body image after lockdown, p-value was significant for “How noticeable do you feel your weight was/is/will be to a stranger(0.043). From the population with gain of 5 kgs or more 4 people reported feeling that their weight was markedly noticeable to a stranger; however, this number doubled to 8 after lockdown.

Discussion

This cross-sectional study shows the association between weight gain (obesity) and lockdown during the Covid-19 pandemic in Pakistan. The population studied ranged from 18-25 years with mostly students who stayed home from Mid-March of 2020 to 15th September, 2020. The results how weight gain affected the physical and mental health of people. 49.1% of

the participants gained weight and the rest of the 50.9% either had stable weight or had weight loss. We have focused on the effects of weight gain which may be due to poor physical activity as weren’t allowed to go outside and many people prefer gyms/outdoors over home exercises, increased screen time, high fatty diet, and less vegetables. Another important reason was that the lockdown period was associated with a higher level of stress and people resorted towards "stress eating" as a coping mechanism as set by prior research of Zachary 2020.³ The most common side effect of weight gain was reduction in physical activities. Of those who gained weight 12 participants had trouble performing daily activities, 8 had difficulty in climbing stairs and 14 reported and an increase in joint pain. This showed that quite a few numbers of participants had side effects of obesity on their health. This can lead to complications later, if obesity is not controlled, such as Diabetes, PCOS in young women, atherosclerosis etc. An article reported that women were at a greater risk of gaining weight due to stressrelated eating.¹⁹ This also brings attention to a relatively ignored population during this pandemic; women with PCOS, the most frequent endocrine disorder in women of reproductive age.²⁰ According to Barber et al. Even though postprandial thermogenesis was significantly lower in women with PCOS, it cannot be linked to weight gain as the resting metabolic rates remain similar to those without PCOS.²¹ However, as established by Deeks et al. PCOS is a significant contributor to anxiety and depression.²² Anxiety and depression, however have are linked to higher BMI, especially in women.²³ With the rise in anxiety due to the pandemic, there may be an increased risk of obesity in women, especially those with an underlying metabolic disorder like PCOS. Ultimately, this may attribute towards the fact that the amount of weight gain might have led to increased levels of inflammatory mediators like TNF,IL-1,IL-6, resulting in osteoarthritis as mentioned previously by Vincent HK.²⁴ The problem of osteoarthritis linked with obesity was more commonly seen in women; it affected the larger stabilizing joints mostly like knee, back and hip, that are important in performing physical activities like climbing stairs as presented also by Elizabeth M Badley in 2020.²⁵

In our society particularly the South Asian society weight gain comes with a social stigma that has a considerable amount of negative effect on the mental

Table 2: Significant Variables for Different Range of Weights

			Population with gain of less than 5 kgs	Population with gain of 5 kgs or more	Stable weight	Population with loss of less than 5kgs	Population with loss of 5kgs or more	P- value
Physical Function								
Because of my weight, I have trouble tying my shoes, putting on/taking off clothes, crossing my legs etc.	Before	Never	57	16	27	29	12	0.021
		Sometimes	2	2	2	2	6	
		Always	-	-	-	-	-	
	After	Never	48	8	27	30	16	0.0001
		Sometimes	10	8	1	3	2	
		Always	1	2	1	-	-	
I am troubled by painful or stiff joints	Before	Never	44	10	21	20	8	0.312
		Sometimes	10	6	5	9	8	
		Always	5	2	3	4	2	
	After	Never	35	6	19	19	13	0.018
		Sometimes	24	9	10	12	5	
		Always	-	3	-	12	-	
Self esteem								
Because of my weight, I am self-conscious	Before	Never	26	8	16	11	6	0.874
		Sometimes	23	7	8	17	10	
		Always	10	3	5	5	2	
	After	Never	23	4	16	9	8	0.026
		Sometimes	22	6	10	15	8	
		Always	14	8	3	19	5	
Because of my weight, I avoid looking in mirrors or seeing myself in photographs	Before	Never	49	11	23	25	10	0.108
		Sometimes	8	6	23	8	7	
		Always	2	1	-	33	1	
	After	Never	42	6	25	26	13	0.001
		Sometimes	16	8	5	5	15	
		Always	1	4	1	2	-	
Because of my weight, I experience ridicule, teasing, or unwanted attention	Before	Never	44	8	18	16	5	0.002
		Sometimes	13	10	10	15	10	
		Always	2	18	1	2	3	
	After	Never	39	5	19	17	11	0.066
		Sometimes	18	11	8	12	5	
		Always	2	2	2	4	2	
Body Image								
How noticeable do you feel your weight was/is/will be to a stranger (if you do not camouflage yourself e.g. with clothes and/or makeup) and the feature has not been pointed out to them?	Before	Not at all	25	5	11	12	1	0.015
		Slightly	3	6	7	12	6	
		Moderately	9	3	5	8	6	
		Markedly	2	4	6	1	4	
		Very	3	-	-	-	-	
	After	Not at all	18	2	11	10	2	0.043
		Slightly	19	4	7	12	8	
		Moderately	14	3	5	8	5	
		Markedly	4	8	5	2	1	
		Very	4	1	1	1	2	
How much do you feel your weight/body shape is the most important aspect of who you are?	Before	Not at all	8	1	6	5	1	0.964
		Slightly	16	5	7	10	6	
		Moderately	20	10	7	10	6	
		Mostly	13	2	7	8	5	
		Totally	2	18	2	-	-	
How much do you feel your weight/body shape is the most important aspect of who you are?	Before	Not at all	8	1	6	5	1	0.964
		Slightly	16	5	7	10	6	
		Moderately	20	10	7	10	6	
		Mostly	13	2	7	8	5	
		Totally	2	18	2	-	-	
How much do you feel your weight/body shape is the most important aspect of who you are?	After	Not at all	10	1	7	4	2	0.311
		Slightly	13	3	6	9	5	
		Moderately	22	6	8	12	7	
		Mostly	10	5	6	7	4	
		Totally	4	3	2	1	-	

health of slightly obese and obese people. People tend to lose self-confidence, self-esteem and start avoiding their own body image. This has been highlighted in our results as well. Before lockdown 60.1% people were self-conscious about their weight and 61.7% were self-conscious after lockdown. More number of people feared social rejection based on their body weight after lockdown than before lockdown. This led them to avoid looking at their body image in mirrors (self-avoidance). Other contributory factors were peer victimization, unwanted teasing, societal pressure as given in prior research of Lowry in 2007²⁶ and has also been shown in our results. There was a gradual increase in number of young adults who were facing teasing and ridiculing due to weight gain after lockdown, whereas it decreased for people who lost weight after lockdown which depicts the strength of peer pressure on overweight individuals.

We lived in a difficult time during the Covid-19 pandemic with a lot of people reporting mental health issues they faced during lockdown and post lockdown. Weight gain could be a contributing factor. The limitations of our study include the questionnaires being sent online there might be a chance that these were not solved by the individuals themselves which may lead to ambiguous results. A proper identification procedure must have been added to avoid such discrepancy. A broader spectrum of age groups should have been used to get an accurate idea about how the weight altered within individuals. Based upon the number of responses, especially the huge share contributed by adults with less than 5 kg gain of weight, it may be suggested that they immediately switch to less fatty diet and observe healthier activities to cover up this short range of weight gain easily. Another limitation that the female responses were not segregated during data collection for the variables and hence the ratio of young females being affected by stiff joints, cannot be deciphered.

Conclusion

In conclusion, it is seen that the community-wide quarantine during COVID-19 pandemic has caused weight gain in adults. This weight gain has occurred due to availability of calorific processed foods, lack of physical activity, emotional distress and overall a sedentary lifestyle that seem to dominate the COVID-19 isolation. Such weight gain is not only deleterious for those who are already overweight, obese, immu-

nocompromised or suffer from severe mental illnesses but also those who were of normal weight pre lockdown, immunocompetent neurotypicals. Our research clearly depicts the substantial changes in weight i.e., an increase of 3.016kg weight on average, post lockdown and an increase of 1.6% in impairment of body image among adults falling in 18-25 age group. With above mentioned results, there's no doubt that covid-19 isolation has not only led to stagnancy causing weight gain in young adults but also low self-esteem and negative body image ultimately giving rise to unhealthy individuals with mental health issues. So, the question arises are we really ready to deal with a low esteemed debilitating generation when the pandemic is finally over?

Conflict of Interest: None

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Author's Contribution

- BU:** Literature search, study design & concept, questionnaire design, data collection
- SU:** Literature search, study design & concept, questionnaire design, data collection, data analysis
- TS, KKS, SF:** Literature search, study design & concept, questionnaire design, data interpretation, drafting
- AB:** Data analysis, data interpretation, drafting
- IF:** Overall supervision, drafting, revision & final approval
- AKR:** Data analysis, data interpretation, drafting