

## A Short Report on Managing Obesity for Optimizing COVID-19 Outcomes

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### Abstract

COVID-19 continues to ravage the continents ever since it was first reported in December 2019 and later declared a world pandemic. As public health continue it's fight against COVID-19 through primary, secondary and tertiary levels of prevention by creating awareness, education about handwashing, social distancing, mask mandates, travel restrictions, immunizations and other strategies through public polices, it is important to study the individual modifiable risk factors of COVID-19 infection which makes the individuals susceptible to infection at a higher rate. One such risk factor is obesity. It has been studied that obesity caused respiratory compromise, increases inflammatory response due to underlying inflammation, and affects the resilience after infection leading to severe illness, higher Intensive Care Unit (ICU) admissions and increased mortality rates. Obesity is being considered as independent factor and an additional risk factor with other co-morbidities affecting the clients pertaining to COVID-19. Since studies have shown that there is increased incidence of weight gain due to changes in life, work, travel and mental health, it is important to address this condition to have better outcomes in relation to COVID-19 infections. Further studies have shown that obesity has detrimental effects on COVID-19 outcomes not just in recovery but also in contracting the disease. These studies provide evidence that there is a high need to manage obesity now specially with the COVID-19 continuing to be prevalent. It is

important that health care workers take responsibility of presenting evidence to the clients about the importance of managing weight. Clients have to be educated about ideal weight and effective methods of not only losing weight but also on long-lasting strategies of remaining at an ideal weight. Since, the COVID-19 continues to be prevalent, it is very important that modifiable risk factors such as obesity should be addressed at practice and research levels.

## Abbreviations

Corona Virus Disease 2019 (COVID-19), Intensive Care Unit (ICU), World Health Organization (WHO), Centers for Disease Control and Prevention (CDC), Body Mass Index (BMI), National Health and Nutrition Examination Survey (NHANES), Renin-Angiotensin-Aldosterone System (RAAS)

## Introduction

Ever since the COVID-19 was identified in December 2019, it has become a major challenge for healthcare. World Health Organization (WHO) declared COVID-19 as a world pandemic with high rate of infections and mortality. Since the severity of the illness was intensified by comorbidities, obesity was looked at closely due to the past experience with H1N1 influenza [1]. The COVID-19 pandemic has caused a swift and strict global response to mitigate the transmission and one of the measures was strict lockdown which was implemented across many countries globally. This measure though helped with mitigation of COVID-19 has caused considerable behavioral changes in physical activity, diet, occupational changes due to remote work and mental health due to social distancing leading to weight gain [2]. It has been studied obesity caused respiratory complications such as increased demand for ventilation, labored breathing, inefficiency of respiratory muscles and decreased respiratory compliance [1]. This has increased the susceptibility to COVID-19, increased intensity of the illness and higher mortality. Since the effects of COVID-19 on obesity are being focused. It is important that the population be educated about managing obesity in light on COVID-19.

## Background

It is important to address obesity as it has been increasing world-wide per the latest data. The Centers for Disease Control and Prevention (CDC) categorizes obesity based on the body mass index (BMI) which is obtained by dividing weight in kilograms by the square of the height in meters. Among adults, obesity is defined as a BMI of 30.0kg/m<sup>2</sup> or above. According to The National Health and Nutrition Examination Survey (NHANES), 2017, United States data shows steady increase of obesity from 22.9% in 1988, to 39.8% during 2015-2016 making it vital to address it for optimum COVID-19 outcomes [3].

In a study conducted at Sheba Medical Center, Israel using a questionnaire about weight gain during lockdown, a mean weight variation of  $-0.1\text{kg} \pm 4.8\text{kg}$  was observed [2]. A descriptive study in Seattle, Washington, among 24 critically ill COVID-19 clients of whom 64% were male, 85% of the obese patients needed a ventilator to support breathing and 62% of the obese clients died as compared to non-obese clients where 64% needed a ventilator and 62% mortality. Another study in Shenzhen, China also conducted a

study based on Basal Metabolic Index (BMI) and found that obese patients with BMI of  $\geq 28 \text{kg/m}^2$  were at 142% greater risk for severe pneumonia. Having this background will help to understand that any additional stress such as COVID-19, can compromise the respiratory system leading to adverse outcomes in client's recovery [1].

## Discussion

To better understand the importance of managing obesity to have better outcomes in COVID-19 infection among obese clients, it is vital to study the physiology of respiratory system in obesity. In general, the respiratory physiology is compromised in obesity due to increased pulmonary vasculature, accumulation of adipose tissue in the abdominal wall, chest and around ribs. Obese clients experience increased resistance in airways during ventilation, increased work during breathing and inefficiency of the respiratory muscles which all lead to expending of extra energy for breathing process. Obese clients are also at a greater risk of contracting COVID-19 as obesity is known to cause renin-angiotensin-aldosterone system (RAAS) imbalance which further leads to excess angiotensin II and angiotensin II receptor type 1 axis which supports the COVID-19 attack and increased viral load in clients [1]. There is also potentially an association between vitamin D deficiency and COVID-19 as vitamin D helps to regulate immune function. Adipose tissue interferes with the Vitamin D release leading to less bio-availability. Vitamin D is specifically important in COVID-19 as it prevents excessive cytokine release which is responsible for inflammation and respiratory failure seen in COVID-19 clients [4].

Due to lockdown and remote work and study, people tend to eat excessively due to behavioral changes due to restriction of socialization. Further, it was noted that there is decrease in physical activity due to remote work and closure of exercise facilities. Remote work and study further increased screen time, which in turn had detrimental effects on eating habits and weight gain. The stress, uncertainty of the end to pandemic and social distancing led to depression and mood changes which further led to change in eating habits and weight gain [2].

Since evidence shows correlation between obesity and COVID-19 outcomes, it is imperative to manage obesity for optimum outcomes of COVID-19 infections. It is important to note that losing weight and keep the weight off is not an easy task. It is important for the healthcare workers to address the myth that obesity is solely genetic or excessive calorie intake as in reality it is cumulation of environmental, social, behavioral, dietary factors. In an effort to address obesity, it is important healthcare workers follow ethical standards of advocating for long lasting dietary modifications as opposed to easy diet strategies which will help clients to lose weight at a faster rate. Further healthcare workers have an ethical responsibility to choose evidence-based words rather than unfavorable words, present evidence-based strategies, help clients to make informed choices of weight loss, and helping clients understand the efficient weight loss strategies [5].

## Conclusion

In conclusion, it is noted that obesity leads to adverse outcomes in COVID-19 due to respiratory compromise, higher rate of infection, and higher mortality rates [1]. Though the pandemic has taken over the globe by uncertainty of coming back to normal in the near future, it is important to mitigate the effects of COVID-19

infections by modifying and managing the risk factors of which obesity is one. Managing obesity appropriately with substantive methods will help to reduce the risk of infection, ICU admissions and mortality rates.

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## Conflicts of Interests

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