

Diet quality and eating habits during COVID-19: What have we learned so far?

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Introduction

There is a strong link between poor metabolic health with several chronic conditions including obesity, type 2 diabetes or hypertension and the increased risk of infection and severity of COVID-19 [1, 2]. Underlying these conditions is the contribution of a poor diet, which may be independently associated with COVID-19 risk and severity.

The COVID-19 pandemic has presented unprecedented challenges around the world. The risk for a more severe Covid-19 disease has been also linked to our lifestyle behaviors and more specifically to the food we eat, the alcohol intake, smoking as well as the levels of physical activity, these habits have changed during the pandemic and impacted us in different ways. At this stage of the pandemic, we are still learning about COVID-19 with stronger evidence now about certain populations that are at greater risk including those with certain health conditions, such as diabetes, respiratory disease, heart disease and cancer being more likely to have severe symptoms, and, unfortunately, more likely to die from COVID-19 disease. Many of these conditions (known as non-communicable diseases or NCDs) are often linked to an unhealthy diet and lifestyle.

Oxidative stress and inflammation are also found to be important factors that impact on a more severe COVID-19 disease especially in the presence of NCDs associated with the antioxidant system fragility. The existing evidence supports the recommendation of antioxidants supplementation as useful strategies against COVID-19 [3-6].

Addressing adverse social determinants of health, including the poor nutrition, has been shown to reduce the burden of certain infectious diseases in the past [7], supporting calls for prioritizing social determinants of health in the public health response to COVID-19. Evidence on the association between diet quality and the risk and severity of COVID-19 in a general population is lacking, especially in the context of upstream social determinants of health.

Diet quality and the risk of a more severe COVID-19 disease

Since the beginning of the COVID-19 pandemic, access to fresh food has been restricted, and people were spending more time inside and their physical activity has dropped. However, reports suggest that more time at home may have resulted in some positive habits including an increase in cooking.

The evidence suggest that the effect of COVID-19 lockdown have in many ways impacted the dietary practices throughout Europe and more globally, and negative diet habits was seen to be associated with other poor lifestyle outcomes including weight gain, mental health issues, and limited physical activity. Both in the short term and if sustained in the long term, these changes may have significant impacts on the health of the population [8].

Poor metabolic health and unhealthy lifestyle factors have been associated with risk of infection and severity of COVID-19 disease. However, the data around the food consumed during the pandemic are still lacking. Improved nutrition, especially in the context of socioeconomic deprivation, has been shown to reduce the burden of certain infectious diseases in the past. Evidence on the association of diet quality with susceptibility and progression of COVID-19 is also lacking.

In a prospective cohort study, Merino et al (2021) [9] investigated the association of diet quality with risk and severity of COVID-19 and its interaction with socioeconomic deprivation. This was a large population-based smartphone survey (COVID-19 Symptom Study) with data collected for the pre-pandemic period using a short food frequency questionnaire, and diet quality was assessed using a healthful Plant-Based Diet Score, which emphasizes healthy plant foods such as fruits or vegetables. Authors found evidence of a synergistic association of poor diet and increased socioeconomic deprivation with COVID-19 risk that was higher than the sum of the risk associated with each factor alone. In addition, a diet characterized by healthy plant-based foods was associated with lower risk and severity of COVID-19. This association may be particularly evident among individuals living in areas with higher socioeconomic deprivation.

This study suggested that efforts to address disparities in COVID-19 risk and disease severity should consider specific attention to improve nutrition status and treat it as a social determinant of health.

Eating behaviours during COVID-19 pandemic

Eating behaviours are usually defined as food choices that are moderated by consumption trends, personal preferences, specific diets, and calorie counting [10]. Defining these variables is not an easy task and have required the information

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derived not from cross-sectional studies but primarily from systematic reviews that have solved some key limitations while aiming to explore the impact of the pandemic on weight-related behaviours that include not only eating behaviours but also politics affecting the food supply and the health consequences in terms of nutritional status. Understanding unhealthy food consumption and habits during the COVID-19 pandemic remains important and relevant for our populations, in particular vulnerable groups (with multimorbidity), older people and those with excess weight that are known to have experienced more acute changes in their eating behaviour.

Eating behaviour is also a complex concept and multifactorial. The outbreak of coronavirus disease 2019 (COVID-19), required the application of various restrictive measures aiming to reduce the spread of infection and the overall impact of this disease. This process resulted on lifestyle changes and disruptions with a potential consequence to the normal patterns of eating behaviours.

A systematic review of longitudinal studies assessed changes in eating behaviour during the COVID-19 pandemic by establishing a comparison of eating behaviours before and after the outbreak of the pandemic [11].

The main findings of the review provided information about a shift towards modified eating behaviours, characterized by an increased snack frequency and a preference for sweets and ultra-processed food rather than fruits, vegetables, and fresh food. Additionally, increased alcohol consumption was found among different countries. Consequently, adherence to healthy diets has decreased. These findings are relevant to future policies and strategies to assess nutrition in cases of alarming situations such as the current COVID-19 pandemic.

COVID-19 and the overall impact on our eating habits

The COVID-19 has affected all aspects of people's lives. Eating habit plays an important role in children and adolescents' physical and mental development with a long-lasting impact to adulthood. The question is what the evidence tells us about any changes in eating habits amongst these age groups to help us to better understand the impact and limit the negative consequences on health.

A systematic review [12] has summarized a comprehensive and updated overview of eating habits changes due to COVID-19 confinements among children and adolescents (investigating a population size of 157,900 participants). Seven categories were identified: daily eating patterns, junk food, beverage, fruits, vegetables, milk and dairy, protein-rich foods, and legumes and cereals.

Most of the included studies reported a significant increase in consumption of home-cooked meals, amount of food, snack, French fries, sweets, fruits, vegetables, legumes, bread, and bakery products. On the other hand, studies demonstrated significantly lower intake of fast food and soft drink. Authors reported that any changes in children and adolescents' eating habits during COVID-19 era were both positive and negative (for example a decrease in fast food, fruit and

vegetable consumption vs. and increase in snacking and sweet consumption). It is expected that these changes may have a significant short and long-term impacts on population health.

Specifically, it has been found that the COVID-19 pandemic has had a global impact on daily diet among adults [13]. Although it has not been possible to establish a correlation between weight gain and changes on eating behaviour, an increased appetite accompanied by a higher consumption of snacks and a greater number of daily meals have been found.

Regarding dependent persons such as the elderly, people with morbid obesity and people with other type of disabilities, scientific evidence has linked preventive measures of physical contact restriction to changes in eating behaviour. Those changes have been associated to a significant decline in healthy nutrition [14].

It is also reported that the situation has been worse in developing countries, where the outbreak of the COVID-19 pandemic has enhanced the need of proper define 'food security' with many developing countries not having adequate supply chains.

Considering the above, the evidence so far suggests the need to properly understand the changes in eating behaviour that occurred during the COVID-19 pandemic and what triggered them and we need more longitudinal studies to address these changes. Finally, promoting some healthy behaviour changes such as shifting eating habits and preparing more meals at home, adopting a more plant-based diet, and staying physically active remain vitally important lessons from this pandemic that will boost our immune response and improve our health and wellbeing.

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