

The impacts of COVID-19 pandemic on food security among pregnant women

Guo Peng *

Department of Public Health, The University of Queensland, Brisbane, Australia

* Corresponding Author Email: guo.peng@uqconnect.edu.au

Abstract. COVID-19 first appeared in late 2019 in Wuhan, China. It has affected more than 600 million people currently all around the world. In the initial stage of the pandemic, the Chinese government acted swiftly to lockdown Wuhan and enforced restrictions on outdoor activities to minimise the virus transmission between people. Policymakers in many countries acted similarly to limit population mobility to minimise the direct effects of COVID-19 on humanity. Accumulating research has been done to investigate the negative impact of food insecurity on pregnant women. Also, there is a growing number of research on virus characteristics, COVID-19 mortality rate, and social and financial implications. However, little research has been done to investigate the food insecurity as an indirect consequence of the pandemic and COVID-19 itself and how it will adversely affect pregnant women. This study identifies three primary factors that contribute to food insecurity among pregnant women during COVID-19: changing eating patterns, difficulty getting antenatal care, and poor socioeconomic level. A review will be conducted in this study with the aim of determining the factors of COVID-19 that could contribute to food insecurity and how it influences pregnant women. A call for action will be generated in three levels in terms of individual, community, and national to support food supplies and promote healthy behaviours among pregnant women.

Keywords: COVID-19, Food Insecurity, Pregnant Women.

1. Introduction

In late 2019, several cases with the unusual respiratory syndrome were reported as pneumonia of unknown in Wuhan, China. Chinese authorities then shared the genetic code of the novel virus in short order for further investigation [1]. In the meanwhile, the action of lockdown was implemented in Wuhan to stop the virus from spreading. SARS-CoV-2 cases, on the other hand, have been documented in over 216 continents and territories in the later three months [1]. COVID-19 was finally classified as a pandemic by the WHO on March 11, 2020 [2]. More than six million individuals have died from COVID-19, according to data published by WHO [3]. To tackle this situation, the governments and health systems of many countries have implemented the policy of quarantine and isolation along with the development of vaccines. Policymakers should, in the meanwhile, consider the indirect effects of COVID-19 [4]. An analysis of the Ebola virus outbreak showed that the outbreak itself had less severe effects than its indirect ones [4].

One of the unintended consequences of COVID-19 is food insecurity. The World Food Programme (WFP) estimates that a quarter-billion people will face catastrophic starvation as a result of COVID-19. Also, an increase of about 14.3% in the prevalence of disproportionate food waste among children below the age of five can be caused by the lockdown method and the mobility restriction [5]. In addition, health intervention usage reduction, such as lower access to maternal health care, can result in an increase in maternal mortality of 8.3 - 38.6% each month. Furthermore, people who eat poorly and have worse nutritional status are more likely to contract COVID-19, which puts additional strain on the health system [5].

The adverse effects of COVID-19 will further contribute to social and health inequities [6]. Household incomes, food supply chain, health services and dietary pattern are the major concerns of the enormous effects of COVID-19 pandemic [7]. It has been projected that food, nutrition, and health status have been negatively affected by COVID-19 among vulnerable groups, such as women during pregnancy and lactating [6]. The aim of this report is to determine and discuss the contributors to food insecurity in pregnant women due to COVID-19.

2. Main factors contribute to food insecurity during COVID-19

2.1. Dietary patterns shift

To prevent COVID-19 virus from spreading, many countries have announced a lockdown as a prevention countermeasure that restricts the mobility of the population and limits the contact between individuals [8]. While the method has helped reduce the number of new cases, studies have found that such confinement has had negative impacts on people's lifestyles, including physical activity patterns and dietary patterns [9]. Limited access to market has reduced the purchase and consumption of the fresh product, such as vegetables and fruits [10]. The restriction of outdoor activities also encourages sedentary behaviours with low energy expenditure, which could be harmful to human physical and mental health [9]. Furthermore, the unhealthy mental status could trigger the conditions of fear, sadness, stress, emotional disturbance, and distress. According to the study, people who experience unpleasant emotions are more prone to have poor diet [9]. Another similar study, which was conducted in Italy in 2021, found that in order to deal with unpleasant feelings during self-quarantine, over half of the individuals reported higher consumption of "comfort foods" such as sweet snacks. [11]. Food security plays a crucial role in fetal growth and maternal health. Food insecurity during pregnancy increases the likelihood of experiencing gestational diabetes, weight gain, and maternal stress [12].

The same trend of dietary was found in pregnant women who were nutritional vulnerable. Precisely, pregnant women were thought to be more prone to making unfavourable lifestyle adjustments in reaction to the COVID-19 pandemic because of various perceived stress sources [10]. It should be guaranteed to provide a well-balanced diet to women during pregnancy to meet the increased nutrient requirements [10]. A cross-sectional study based on the data collected from Italy analysed that two-thirds of the participants were exposed to poorer diets than the daily recommendation. Moreover, investigators of this study found a shift in the dietary pattern toward 'western' among pregnant women during the lockdown period. It was observed that there was an increased consumption of high energy-density food and less consumption of fresh food among mothers [10].

Lockdown of the city leads to reduced physical activity and elevated distress. Then, increased stress leads to a higher intake of sugary food and snacks. However, the health outcomes of such eating patterns are significant. Firstly, long-term consumption of high energy density food has the ability to trigger a raised serum IL-6 level which helps develop insulin resistance and hyperglycaemia [13]. Pregnant women with such metabolic syndromes are at risk of developing gestational diabetes mellitus (GDM) [14]. Adversely, according to study, GDM during pregnancy raises the likelihood of developing a severe COVID-19 infection, and pregnant women have higher risk of hospitalisation compared to non-pregnant women [14]. To tackle the lockdown method's negative impacts on pregnant women's health outcomes, additional support and dietary interventions should be implemented.

2.2. Antenatal health care

Since early detection and management of pregnancy-related complications is important to lower the risk of death and morbidity in infants and pregnant women, it is crucial and necessary to ensure the accessibility and availability of antenatal care (ANC) to pregnant women [15]. As WHO recommended, pregnant women should attend the ANC at least eight times during pregnancy, and the first visit should be carried out during the first trimester of gestation [15]. Prenatal care settings, in particular, play a crucial role in identifying and resolving social risk factors that may influence pregnant women's health, such as food and shelter [12]. Prenatal care visits that include food insecurity screening help to identify individuals who are at-risk and provide early intervention to promote both mother and child health [12]. It is imperative to assist expectant mothers with their dietary needs by conducting screening and offering food and nutrition support [12].

The COVID-19 epidemic has caused severe health system disruptions in both high-income and low- and middle-income countries (LMICs) worldwide [4]. In this context, it is difficult to maintain

routine services, and it has challenged the accessibility as well as the availability of these services [4]. The pandemic response has involved a substantial shift in the number of health professionals, efforts, and medical provisions [4]. A cross-sectional study found that only 14% of pregnant women achieved adequate ANC attendance during COVID-19 compared with 20% of pregnant women before COVID-19 [15]. In some African countries, such as Kenya, Uganda and Tanzania, maternal health workers have reported low ANC utilisation and late hospital attendances without adequate antenatal care [16]. The common reasons for such low ANC attendance were insufficient medical equipment or health workers supplied in ANC and the dread of contracting COVID-19 among pregnant women inhibiting their outdoor activities [15].

Limited literatures have been found to explore the way of COVID-19 to affect food security screening provided by ANC. There was one research has assessed the usage of food insecurity screening tool for pregnant women during COVID-19 in Northern New England. It was concluded that food insecurity tool used during ANC visits was informal and the timing and frequency of food insecurity assessing was inconsistency during COVID-19 [12]. Researchers also emphasised the importance of ANC to create a supportive environment to openly discuss the needs about food insecurity between patients and health workers, and to develop a healthy eating behaviours during pregnancy [12]. Participants who employed informal screening techniques expressed a desire to develop more formal screening procedures [12]. Similar result was investigated by another study in which the participants discussed interest in improving more access to community resources in the ANC [17].

2.3. Socioeconomic Status

Numerous studies on pregnant women have examined the connection between socioeconomic status (SES) and food insecurity. Additionally, it has been noted that food insecurity is more likely to affect expectant mothers in LMICs [18]. In Iran, pregnant women with gestational ages ranging from 14 to 42 weeks participated in a cross-sectional study in 2014 [19]. there have been 420 pregnant women in total, and 30.9% reported food insecurity during the study period. Moreover, it was discovered that households with lower SES were 53% more likely to experience food insecurity than families with higher SES [19]. Furthermore, in some LMICs, especially in some African countries, there is a large gender disparity in the prevalence of food insecurity [18]. Due to gender inequity, women have lower SES and are more vulnerable to food insecurity than men [18].

COVID-19 has affected food insecurity directly worldwide. The closure of the borders of countries and the policy implementation of quarantine and isolation has disrupted the food supply chain and increased the food price [20]. In addition, COVID-19 has led to increased massive poverty. Also, reduced cross-border trade has led to unemployment [20]. Therefore, loss of income and massive unemployment challenge people to get access to and afford a stable food supply [20]. Several studies have been found to illustrate that the COVID-19 epidemic has exacerbated food insecurity among women in LMICs. A dramatic reduction in female employment has been observed in Nigeria, which was from 20% of female workers to only 2% due to COVID-19 [18]. In South Africa, women made up five of the six farmers who had to completely halt operations. Women are more likely than men to face food insecurity as a result of the loss of crucial components such as employment and income [18].

Pregnant women have been investigated to determine the association between SES and food insecurity, and a growing body of research has drawn attention to examining how COVID-19 may indirectly contribute to global food poverty. Also, several studies have explored the contribution of COVID-19 to gender inequity in LMICs. Unfortunately, there have been few investigations on the impact of COVID-19 on SES with a focus on pregnant women. However, it is not difficult to speculate that the likelihood that COVID-19 will have an impact on pregnant women's SES is higher. Pregnant women have reduced mobility and are less active than non-pregnant women and men. Thus there is a high probability of loss of jobs and income among pregnant women, which can worsen food insecurity among such a population.

3. Interventions

The limitation of mobility due to COVID-19 has dramatically changed the dietary behaviours of pregnant women toward an unhealthy one by increasing their distress and decreasing physical activities. Then, at the community level, the health systems, especially antenatal healthcare, have been disrupted to deal with the COVID-19 pandemic, which led to insufficient medical supplies and health workers as well as accessibility in the ANC. Furthermore, the unstable food system directly affected people's accessibility and affordability to healthy goods at the global level. Also, gender inequity and loss of jobs and income make things even harder to reach better food in the women population. All three levels contribute to food insecurity to varying degrees, and measures should be implemented to alleviate the current food insecurity faced by pregnant women caused by COVID-19.

Actions at the individual, community, and national levels are needed for pregnant women who are facing the issue of food insecure [9]. Individuals during COVID-19 are responsible for maintaining a healthy emotional status, choosing a better diet, and taking care of their dietary intake [9]. However, it is hard to maintain good emotional and dietary conditions by self-regulation alone. It is recommended for community organisations to develop a partnership with clinics, such as ANC, to maintain stable resources in terms of food supplies and human resources in clinics during COVID-19 [12]. Then, the community can get involved in implementing food support within ANC to openly discuss food needs and build trust with pregnant women and encourage them to attend ANC for maternal health checks regularly [12]. Moreover, it is necessary to develop and implement systematic processes for food insecurity assessment within ANC to ensure screening consistency for food insecurity. Also, the community and ANC should put more attention on supporting pregnant women who are at higher risk of food insecurity [12]. At the national level, governments should publish policies to protect the healthcare system from resource shifting in to respond COVID-19 [5]. Furthermore, policymakers should consider women and pregnant women as vulnerable populations of gender inequity, and subsidies can be adopted for them to promote healthy purchasing behaviours [5].

4. Conclusion

The outbreak of COVID-19 has challenged every country to protect its population against hunger and health insecurity. While countries are protecting people from COVID infection, the indirect effects of COVID should also be taken seriously, especially for susceptible special groups.

This study has discussed the vulnerability of pregnant women to suffering from food insecurity during COVID-19. Restriction and limitation of outdoor activities and mobility lead to limited access to fresh products and promote negative emotions among pregnant women, which then contribute to shifting dietary behaviours toward more western styles. Then, with the movement of personnel and supplies to respond to the COVID-19 emergency, the lack of health workers and supplies has affected the routine usage of ANC by pregnant women, resulting in a decline in ANC utilisation. Gender inequity has been found to contribute to food insecurity in many LMICs during COVID-19 by directly affecting the employment and income among women. Therefore, all three tiers, in terms of individual, community, and national levels, should take responsibility to take actions to tackle such a situation.

References

- [1] Dhar Chowdhury S, Oommen A M. Epidemiology of COVID-19 [J]. Journal of digestive endoscopy, 2020, 11(1): 3–7.
- [2] Sharma A, Ahmad Farouk I, Lal S K. Covid-19: A review on the novel coronavirus disease evolution, transmission, detection, control and prevention [J]. Viruses, 2021, 13(2): 202.
- [3] WORLD HEALTH ORGANIZATION. WHO COVID-19 dashboard [EB/OL]/World Health Organization. (2022) [2022-10-01]. <https://covid19.who.int/>.

- [4] Robertson T, Carter E D, Chou V B, et al. Early estimates of the indirect effects of the COVID-19 pandemic on maternal and child mortality in low-income and middle-income countries: a modelling study [J]. *The Lancet Global Health*, 2020, 8(7): e901–e908.
- [5] Picchioni F, Goulao L F, Roberfroid D. The impact of COVID-19 on diet quality, food security and nutrition in low and middle income countries: A systematic review of the evidence [J]. *Clinical nutrition (Edinburgh, Scotland)*, 2021.
- [6] Pérez-Escamilla R, Cunningham K, Moran V H. COVID-19 and maternal and child food and nutrition insecurity: a complex syndemic [J]. *Maternal and child nutrition*, 2020, 16(3): e13036.
- [7] Mardones F O, Rich K M, Boden L A, et al. The COVID-19 Pandemic and Global Food Security [J]. *Frontiers in veterinary science*, 2020, 7: 578508.
- [8] Izzo L, Santonastaso A, Cotticelli G, et al. An Italian survey on dietary habits and changes during the COVID-19 lockdown [J]. *Nutrients*, 2021, 13(4): 1197.
- [9] Naja F, Hamadeh R. Nutrition amid the COVID-19 pandemic: a multi-level framework for action [J]. *European journal of clinical nutrition*, 2020, 74(8): 1117–21.
- [10] Magnano San Lio R, Barchitta M, Maugeri A, et al. The Impact of the COVID-19 Pandemic on Dietary Patterns of Pregnant Women: A Comparison between Two Mother-Child Cohorts in Sicily, Italy [J]. *Nutrients*, 2022, 14(16): 3380.
- [11] Bennett G, Young E, Butler I, Coe S. The Impact of Lockdown During the COVID-19 Outbreak on Dietary Habits in Various Population Groups: A Scoping Review [J]. *Frontiers in nutrition (Lausanne)*, 2021, 8: 626432.
- [12] Canavan CR, D’cruze T, Kennedy M A, et al. Missed opportunities to improve food security for pregnant people: a qualitative study of prenatal care settings in Northern New England during the COVID-19 pandemic [J]. *BMC nutrition*, 2022, 8(1): 8.
- [13] Fedullo A L, Schiattarella A, Morlando M, Raguzzini A, Toti E, De Franciscis P, et al. Mediterranean Diet for the Prevention of Gestational Diabetes in the Covid-19 Era: Implications of Il-6 In Diabesity [J]. *International journal of molecular sciences*, 2021, 22(3): 1213.
- [14] Ramirez Zegarra R, Dall'Asta A, Revelli A, Ghi T. COVID-19 and Gestational Diabetes: The Role of Nutrition and Pharmacological Intervention in Preventing Adverse Outcomes [J]. *Nutrients*, 2022, 14(17): 3562.
- [15] Landrian A, Mboya J, Golub G, et al. Effects of the COVID-19 pandemic on antenatal care utilisation in Kenya: a cross-sectional study [J]. *BMJ open*, 2022, 12(4): e060185.
- [16] Kotlar B, Gerson E, Petrillo S, Langer A, Tiemeier H. The impact of the COVID-19 pandemic on maternal and perinatal health: a scoping review [J]. *Reproductive health*, 2021, 18(1): 10.
- [17] Garg A, Toy S, Tripodis Y, Silverstein M, Freeman E. Addressing social determinants of health at well child care visits: A cluster RCT [J]. *Pediatrics (Evanston)*, 2015, 135(2): e296–e304.
- [18] Vanvolkenburg H, Vandeplas I, Touré K, et al. Do COVID-19 and Food Insecurity Influence Existing Inequalities between Women and Men in Africa? [J]. *International journal of environmental research and public health*, 2022, 19(4): 2065.
- [19] Yadegari L, Dolatian M, Mahmoodi Z, Shahsavari S, Sharifi N. The Relationship Between Socioeconomic Factors and Food Security in Pregnant Women [J]. *Shiraz e-medical journal*, 2017, 18(1).
- [20] Pérez-Escamilla R, Cunningham K, Moran V H. COVID-19 and maternal and child food and nutrition insecurity: a complex syndemic [J]. *Maternal and child nutrition*, 2020, 16(3): e13036.