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**Dr. Medha Kumari**  
+2 Teacher (Home Science)  
Shiv Ganga Balika  
+2 High School, Madhubani,  
Bihar, India

## Fear eating & lifestyle of pregnant women in pandemic

**Dr. Medha Kumari**

### Abstract

Reproductive health is a significant public health issue during pandemics; however, the impacts of the pandemic on non infected pregnant women are still unknown. This study intends to examine whether changes of food and lifestyle of pregnant women occurred during the pandemic triggered by disease concerns and to explore the associations among dietary changes, and gestational weight gain. Based on an online survey of new mothers who experienced the lockdown in their third trimester were recruited from states of India. The study shows about socio demographic characteristics, concerns about the pandemic, maternity information, physical activities, and dietary changes during lockdown. The results also show that the average diet of pregnant women living in a severely affected area, who are very worried about the pandemic and who had less physical activity had a higher tendency of food and eating. Although there is a dietary pattern changed during pandemic, the average gestational weight gain in the studied group was in the normal range. In conclusion, this study indicated that lifestyle and food pattern occurred in a proportional number of pregnant women during the pandemic and is associated with excess gestational weight gain mediated by increased intake of certain foods. The findings suggest the need for psychosocial and nutritional education and interventions during pregnancy checkups. Further studies are needed to determine modifiable psychosocial predictors and potential nutritional concerns in pregnant women during disease outbreaks.

**Keywords:** pandemic, emotional eating, dietary intake, pregnant women, gestational weight gain

### Introduction

By 28 May 2020, the novel 2019 corona virus disease (COVID-19) has reached 217 countries and has infected more than 349,000 confirmed cases. Due to the highly contagious nature of this novel corona virus, many countries have adopted several unprecedented measures to control disease transmission, including the suspension of public transportation, closure of public spaces, and isolation and management for infected people and suspected cases. A “shelter at home” policy is also required or encouraged for the uninfected residents in numerous countries. These measures more or less substantially changed people’s lifestyle. Reproductive health is a significant public health issue during pandemics; however, there is a limited amount of information on how the novel corona virus affects pregnant women. Although several studies indicated that pregnant women are no more likely to be at a higher risk of becoming seriously ill from COVID-19, a previous study revealed women experience changes in their bodies that may increase the risk of other illnesses, such as viral respiratory infection. This uncertainty is feeding many pregnant women’s anxiety. Researchers said that several concerns regarding COVID-19 during pregnancy have been raised, including (i) the presence of family members given quarantine constraints; (ii) potential virus exposure during visits to physicians; (iii) potential requirement of early termination of pregnancy through elective cesarean section; and (iv) Potential postpartum complications. As a consequence, when a stressful situation of this magnitude arises, people often experience substantial changes in their behaviors, such as eating and lifestyle. These emotion-based changes in eating behavior range from overeating or binge eating to severe caloric restriction. Fear-eating (FE) has been seen in people after natural disasters, such as earthquake, but it has not yet been reported in the COVID-19 pandemic. However, psychologists have claimed that there is a high risk of occurrence of fear-eating (FE) during the COVID-19 pandemic and that people should learn how to cope with it [1]. FE may cause impacts on pregnant women. On the one hand, excessive weight gain caused by excessive intake could lead to many adverse pregnancy outcomes, such as higher gestational weight gain (GWG), higher caesarean section rate,

**Corresponding Author:**  
**Dr. Medha Kumari**  
+2 Teacher (Home Science)  
Shiv Ganga Balika  
+2 High School, Madhubani,  
Bihar, India

macrosomia, and early onset obesity. On the other hand, insufficient food intake during pregnancy may also restrict intrauterine growth, may contribute to malnutrition in offspring, and may cause life-long effects. In addition, regular pregnancy check-up were more or less impacted by the pandemic, which put pregnant women at a higher risk of poor parental health management. To the best of our knowledge, there is no such research exploring the effects of COVID-19 on non infected pregnant women. This study recruited new mothers who experienced self-isolation in their third trimester (from February to April) to explore the prevalence of FE during the COVID-19 pandemic, dietary intake, and its association with gestational weight gain.

### Analysis & Interpretation

As one of the most vulnerable groups, the health of pregnant women with COVID-19 infection has aroused great concern worldwide. However, there is limited data in regard to the health effects of COVID-19 pandemic on non infected pregnant women, which is a much bigger group, and who also experienced great lifestyle changes during lockdown time. Our study firstly reported the FE that exists in Indian pregnant women and it associated with dietary intake and pregnant outcomes. Women who have more physical activities were associated with a lower FE score. Not surprisingly, exercise is considered as one of the most effective ways of regulating mood and it works as a treatment which could help people to curb FE. In addition, we infer that this inverse association may also be explained by less life restrictions that could both provide a more feasible environment for exercise and could lead to less worry. The current study reported that women had strong concerns on COVID-19 pandemic, with over 30% of participants rating their concerns. In addition, we observed that the concerns were positively associated with FE tendency; as the psychologist warned, concerns on COVID-19 may trigger the occurrence of FE. To explore the pathway between FE and GWG, firstly, we examined whether FE was related with dietary changes during lockdown time. We observed a direct association between FE and higher cereal and oil food intake. This phenomenon is typical in fear eating, which usually results in excessive intake of high energy dense food. Our finding was also consistent with studies conducted in Poland and Italia, which reported that people during lockdown time tend to snack more; however, the potential reasons were not mentioned in these two studies. The increasing consumption of foods with high hedonic value usually results in excess weight gain and increased risks of chronic conditions such as cardiovascular diseases and obesity. Another finding in the current study deserving our utmost attention is that we observed a decreased consumption of fish in the studied population, especially in women with a higher FE score. Although the study conducted in Indian adults during COVID-19 pandemic indicated that there was a generally good food accessibility and that most food could be accessed via traditional in-person grocery shopping or online delivery, indeed there was an insufficient intake of fish during lockdown time, especially in the regions severely affected by disease where food mostly depended on government/community distribution. On the contrary, studies conducted before COVID-19 revealed that usually there is a rising consumption of most foods including fish in the third trimester, which could greatly meet the increasing nutritional need in late pregnancy. Fish could provide high-quality protein, unsaturated fatty acid, and minerals. On one the hand, these nutrients could ensure a more optimal nutritional status

for a well-functioning immune system to protect against viral infections. On the other hand, these nutrients are also crucial for fetus growth and development. In this study, unfortunately, we could not estimate the nutrient intake and did not obtain blood samples, so whether nutrients deficiency already occurred in Indian pregnant women could not be measured. However, the associations between fear eating, dietary intake, and pregnant outcomes were evaluated. With a self-reported pre-gestational weight and weight before labor, the GWG was calculated. Although there is a dietary pattern changed during pandemic, the average GWG in the studied group seems in the normal range and the excess GWG is similar to a study reported pre-COVID-19 pandemic [32]. Although, the effects of FE on weight gain and obesity were well documented, there is a dearth of research focus on examining potentially modifiable psychosocial predictors of excess GWG. One American study conducted in 2018 indicated the relation between emotional-fear cues and excess GWG and revealed a tendency to eat high fat food being the mediator. In current analyses including sensitive analysis control of pre-BMI and gestational metabolic disease shows that a higher FE score was associated with a higher rate of excess GWG in the population. Combined with findings on the association between FE and higher cereal and oil intake, we support the hypothesis of “high energy dense foods” cravings mediating the relationship between FE and excess GWG. In a sensitive analysis, we also reported that only a moderate FE score was found associated with excess GWG among Indian population; however the interpretation is limited by the sample size. In the case of food, access in India during lockdown period was highly dependent on food distribution by the government or community; thus, food craving behaviors may not be as significant. However, it is worth noting that women in India had a higher FE score and more concerns on COVID-19, so physiological intervention is more urgent to this population. In addition, as documented by a previous study, FE could also act as the restriction of food intake. However, because the fear eating in this survey only focus on the urges to eat, whether FE could cause food restriction and subsequently impose on pregnant health could not be measured. Current data shows that some women indeed had a decreased intake of fish, sugar, oil, meat, and pulse; thus, the mediation model of whether FE occurrence in disease outbreak could be through decreasing consumption of certain food, impacting pregnant health, needs to be urgently explored.

### Conclusions

This study revealed that FE (Fear Eating) occurred in a proportional number of pregnant women during the COVID-19 pandemic and that women living in a severely affected areas who strong worried about the pandemic and who had lower physical activity levels had a higher tendency of FE. Mediated by craving certain food, FE was associated with excess GWG. This study will allow us to develop recommendations on how to manage pregnancy health in non infected pregnant group in the COVID-19 pandemic and in the case of repeated epidemic emergencies. Based on the findings from the current study, we have proposed the following recommendations:

Psychological services and education, such as psychological counseling during regular pregnancy check or online counseling, are needed to help women cope with and release stress and to manage occasional FE, especially in the areas severely impacted by COVID-19 and the lockdown policy;

Nutrition education and intervention are essential to encourage a more balanced diet in pregnancy; and more research is urgently demanded to identify potential nutritional concerns in non infected pregnant women to provide corresponding strategies.

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