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Association of food access, diet and nutrition with depression in women of reproductive age: Review of the evidence and new results from Bangladesh

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This thesis explores the association of food access and nutritional status with depression in women of reproductive age through a systematic review of the literature and a new analysis in the low-income setting of Bangladesh. Depression is a leading cause of morbidity worldwide, and has serious consequences for the health and productivity of populations. Women of reproductive age have a high risk of developing depression worldwide. Depression prevalence in women in low- and middle-income countries is even higher than in high-income settings. The risk of depression is thought to be exacerbated by other health burdens and life-course insults such as trauma and inequity.

Diet and nutrients have been hypothesized to be involved in the pathophysiology of depression due to their role in the neurotransmission system. During pregnancy and lactation, nutritional demands increase, and deficiencies thus arise more easily, which in turn may increase the risk of depression. In addition to individual nutrient deficiencies, dietary patterns and complex food synergies may also contribute to mental health. Conversely, depression may lead to poor nutritional status via poor self-care, lack of motivation and loss of agency. In any case, women experience heightened risks of poor diets, nutritional deficiencies and depression, especially during the peripartum period.

I conducted a systematic literature review to examine the existing evidence on the associations between nutritional status and peripartum depression. Over 5000 articles were screened for the review, excluding two updates. I found 35 articles assessing dietary or supplement intake and depression, and 24 articles that assessed biological nutrient concentrations against depression. Based on the review, some evidence exists for links between both dietary intake and supplementation and nutrient levels measured in the blood. Certain diets, such as those high in fish, healthy or Mediterranean diets, and higher levels of certain nutrients, such as vitamin D, polyunsaturated fatty acids (PUFAs) and carotenoids, have the best

evidence of an association with depression. However, given the methodological limitations of studies on this topic and few studies in populations with poor nutritional status, the lack of consistent evidence does not necessarily imply the absence of true associations.

I also conducted an analysis of the association between depression and several measures of food access, diets and nutrition. I used baseline data from a cluster-randomized field trial of a homestead food production program in Bangladesh, the *Food and Agricultural Approaches to Reducing Malnutrition (FAARM)* study, collected in 2015 from 2,624 women. Multivariable logistic regression was used to analyze the associations of depression with food insecurity, household food consumption, women's dietary diversity, anemia and women's body mass index.

In this population, 20% of women screened positive for major depressive disorder. Household food insecurity, poor household food consumption, women's dietary diversity, and low BMI was positively associated with screening positive for depression in both non-peripartum and peripartum women. Additionally, certain food groups, especially eggs, fish, and vitamin C-rich foods, lowered the odds of depression in women in this sample. The strong associations observed between depression and food and nutrition measures may be a starting point for designing studies or analyses able to assess the causal direction of the relationships observed in these data.

Both depression and poor food access and nutrition in women, especially mothers, have detrimental and sometimes irreversible consequences for these women and their families. All efforts to understand and address poor diets and nutrition as well as depression could improve the lives of many through direct alleviation of these maladies, and many other inter-related health burdens.