The Association Between Childhood Diet and Depression

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Introduction

- An estimated one in five U.S. adults live with a mental illness (NIMH, 2024).
- The annual prevalence among U.S. adults includes 8.3% of adults being diagnosed with depression (NAMI, 2023).
- Studies have demonstrated that childhood malnutrition during critical growth stages significantly influences neurodevelopment and cognitive outcomes, with long-term effects on mental health (Kirolos et al., 2022) and that nutrient deficiencies in early childhood are linked to cognitive and behavioral challenges (Toh et al., 2023; Dimov et al., 2019)
- Many studies have explored the overall impact of childhood malnutrition on mental health, however, there is a lack of research focusing specifically on childhood diet's effects on depression.

Research Questions:

- Does diet in adolescence affect the probability of being diagnosed with depression during adulthood?
- Does the consumption of different foods influence the probability of a depression diagnosis?

Methods

Sample:

- The sample was drawn from the first and fifth waves of the National Longitudinal Study of Adolescent to Adult Health (ADDHEALTH).
- Wave 1 was conducted from 1994-2008 and included 6,504 adolescents in grades 7-12 across the United States.
- Wave 5 took place from 1994- 2018, and was comprised of 4,196 adults who had previously participated in the first wave, but are now aged in their late 30s to early 40s.

Measurements:

- Childhood diet variables were categorized based on the response to "What do you usually have for breakfast on a weekday morning?" for each of the following items: Milk, Coffee or Tea, Cereal, Fruit or Juice, Eggs, Meat, Snack Foods, Bread/Toast/Rolls, Other Items, and Nothing. Possible responses were yes or no
- Sex variables were categorized as "male" or "female"
- Depression diagnoses were measured with the question "Has a doctor, nurse, or other health care provider ever told you that you have or had depression?". Responses included 1 (yes) or 0 (no)

Discussion

- Meat and Eggs both confound bread/toast and rolls
- Figure 1 shows that frequently eating fruit/juice, meat, eggs, and bread/toast/rolls for breakfast all result in lower likelihoods of being diagnosed with depression in adulthood than not eating these foods.
    - Eating these foods for breakfast on a usual basis during childhood is beneficial in reducing the probability of being diagnosed with depression
- Figure 2 illustrates being a male decreases the probability of having a depression diagnosis, and eating meat and eggs for breakfast also decreases the probability, no matter one's sex.
- These results contribute to the previous literature that found that nutrient deficiencies during childhood are related to mental health
    - Previous research found that childhood malnutrition and adult mental health was correlated, however, this research illustrates that what one regularly eats for breakfast contributes to the probability of a depression diagnosis.
- Further studies should consider the following:
    - Examining the effects various foods have on different mental health diagnoses, such as anxiety or OCD
    - Looking at more details about certain foods that reduce the probability of a depression diagnosis (ie: what about the food reduces the probability)

References

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Results

Univariate:

- 34.87% of participants reported typically eating fruit or drinking juice for breakfast, while 65% indicated that they did not.
- 17.24% of participants stated they usually ate eggs for breakfast compared to 82.64% of participants which stated they did not.
- 36.42% of participants claimed to typically eat bread, toast or rolls for breakfast, while 63.45% indicated that they did not consume bread, toast or rolls in the morning
- 11.96% of participants reported usually eating meat for breakfast while 87.92% did not.
- 51.60% of participants identified as female while 48.39% of participants identified as male.
- 48.12% of participants have never been diagnosed with depression while 16.17% of participants have been diagnosed

Bivariate:

- A simple logistic regression showed that breakfast food consumption had statistically significant associations between depression diagnoses and the following foods: meat ($p = 0.0006297$), bread/toast/rolls ($p = 0.04846$), eggs ($p = 0.0001698$), and fruit/juice ($p = 0.0464$)
    - No other foods were found to be statistically significant.
- The chi squared test revealed a statistically significant relationship between sex and depression ($p=2.2e-16$)

Multivariate:

- When combining various foods, frequent meat consumption was shown to have a statistically significant association with depression, suggesting that those who eat meat for breakfast may have lower odds of being depressed compared to those who do not ($p=0.00281$).
    - Bread/toast/rolls ($p=0.45441$) and fruit/juice ($p=0.1813$) do not show a significant effect on depression status.
- The multivariate logistic regression showed that eating eggs for breakfast was significantly associated with a lower likelihood of a depression diagnosis ($p=0.000936$).
    - Bread/toast/rolls and fruit/juice both do not show significant association with depression in this model.
- A regression examining meat and egg consumption for breakfast revealed a significant relationship ($p=0.0455$ and $p=0.0119$ respectively).
- Controlling for sex, sex (male) was very statistically significant ($p=<2e16$), with males having significantly lower odds of a depression diagnosis compared to females (odds ratio= 0.4845).
    - Meat and eggs were no longer significantly associated with lower odds of depression, suggesting that sex is a confounder for the egg and meat variables.

Figure 1: The Relationship Between Eating Various Foods and The Probability Of A Depression Diagnosis

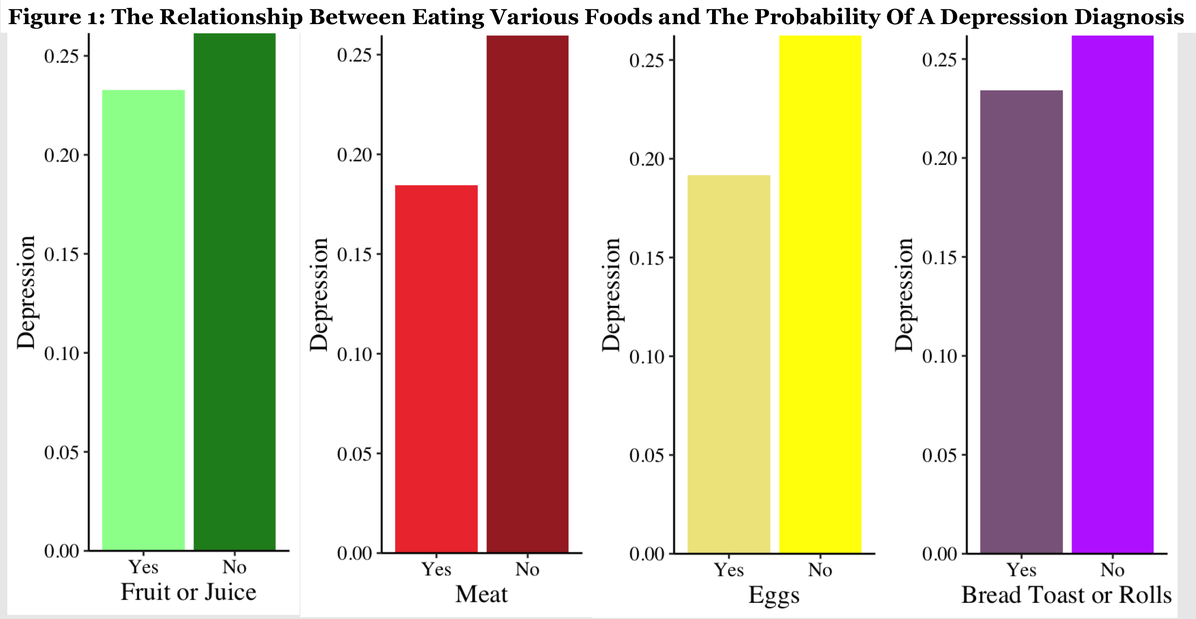

Figure 2: The Effect Meat And Eggs Have On The Probability Of Depression When Controlling for Sex