

HEALTH AND HUMAN SCIENCES

The Dependence of Mood and Mental Functioning on Glycemic Status: A Pilot and Feasibility Study

Student researcher: **Destiny Matthews, Senior**

Symptoms of depression occur at higher rates in adults with diabetes compared to the general population; both diseases are influenced by sleep patterns and adiposity. These inter-relationships have not been critically examined during adolescence. In this pilot and feasibility observational study, we hypothesized that hyperglycemia elevates depression scores in adolescents with obesity. Excess adiposity and abnormal sleep may also assist in explaining this relationship.

This study was a secondary analysis using data from an ongoing behavioral intervention in adolescents, which focuses on reversing prediabetes in adolescents with obesity, called the Dietary Interventions for Glucose Tolerance In Teens (DIG IT) study. DIG IT uses health coaching to help adolescents and their families to improve their diet and physical activity behaviors. From DIG IT participants we used information obtained from the Patient Health Questionnaire 9 (PHQ-9) and the PedsQL questionnaires, which captured psychosocial and behavioral risk factors for diabetes by measuring depressive symptoms and quality of life, respectively. Laboratory values included glycosylated hemoglobin (HbA1C) and plasma glucose concentrations at fasting and following glucose tolerance tests. The statistical analysis included correlations between laboratory values and questionnaire scores.

The results established that the measures of mood and mental functioning were not significantly associated with any measure of hyperglycemia: glycosylated hemoglobin, average fasting glucose, or 2-hour oral glucose tolerance. The PHQ-9 depression and the PedsQL psychosocial health subscores were also not associated with obesity. However, disturbances in sleep and depressive symptoms were positively correlated ($r = 0.6807$, $P = 0.002$).

We did not observe a relationship between hyperglycemia and depression, but it is feasible to study these relationships in the future, with more participants, so our findings will be more definitive.

Research advisor Nana Gletsu Miller writes: "Destiny extracted measures of depression and quality of life from questionnaires that are commonly used in the clinic setting to evaluate behavioral risk factors of diabetes in adolescents. She laid the ground work for our laboratory to determine whether relationships exist between hyperglycemia and mood and mental function. Diabetes and mental health diseases are highly prevalent in adolescents; if these diseases are causally linked, it may be beneficial to design strategies that target both disorders to optimize prevention and treatment outcomes."



The DIG IT study compares the effectiveness of a health coaching intervention versus a single dietary consult in improving diet and physical activity for reversing prediabetes in adolescents with obesity. This study was a secondary analysis of psychosocial and biochemical data acquired from the DIG IT study.