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## Methods

### Study design

The Pregnancy Related Eating Sleeping, and Stress (PRESS) cohort was developed as a longitudinal, survey-based, clinical research study. This study was designed to understand nutritional and behavioral contributors to perinatal health. Participants were recruited into PRESS either by self-selection on the University of Michigan Health Research page or were invited to enroll based on their current OB status at Michigan Medicine reflecting pregnancy. Survey information for this analysis includes those captured at 20-24 weeks gestation (trimester 2), and 30-34 weeks gestation (trimester 3).

### Study population

Individuals who were interested in the study were directed toward a public REDCap link that results in a screening questionnaire. Those who were 18 years old, currently pregnant, in weeks 1-30 of pregnancy, and were currently receiving care and planning to deliver at Michigan Medicine we deemed as eligible. Those who were invited to join the study. We gained informed consent to use survey responses in a research capacity as well as to have read-only access to medical records for the current pregnancy for themselves and for their resulting children. Those who were consented into the study were then directed toward our survey instruments. For data analysis, we excluded individuals with missing timing data, non-plausible timing data, those who were expecting multiples, had pre-existing diabetes before pregnancy, were lost to follow up, or had not had medical chart information abstracted at the time of the analysis.

### Exposure measurement

Our primary exposure was the timing of eating during pregnancy. This was assessed during each trimester using a questionnaire that asked participants “**On a typical day during this trimester, when was the first time in the day you had something to eat? (This includes beverages that have calories; like coffee or tea with cream or sugar)**” to indicate the beginning of an eating window, and “**On a typical day during this trimester, when was the last you had something to eat before going to bed? (This includes beverages that have calories; like coffee with cream or sugar)**” to indicate the end of the eating window. We collected this information for both workdays and weekend days. We then calculated eating duration as the difference between the last eating occasion and first eating occasion and expressed this as hours. To determine fasting duration, we subtracted eating duration from 24 hours. We also evaluated the first and last eating time as an independent exposure, which was expressed in military time. Midpoint of overnight fast was calculated as 1/2 the duration of fasting added to the timing of the last meal of the day. Data were cleaned by inspecting first and last eating and start/stop sleeping to be non-overlapping. Values that did not report timing data in military time were manually assessed and converted to 24-hour format when necessary

### Outcome measurement

The main outcomes of interest were objective values that were abstracted from the medical chart of participants. Trained research staff who had been given view-only access to OB records accessed the participant’s medical charts after their expected due dates and viewed the delivery note. From the medical records of enrolled patients, we collected mid-gestation oral glucose tolerance test results in mg/dL and infant birth weight in grams. We also collected other critical covariate information such as history of diabetes (type 1, type 2, and gestational), current diagnosis of gestational diabetes, history of or current pre-eclampsia, pre-gestational or gestational hypertension, parental body weight before delivery, sex of the infant, gestational age of infant at birth, and delivery method.

#### Oral Glucose Tolerance Test values

The primary outcome for parental health was the results of oral glucose tolerance test that is administered during mid-gestation to all pregnant parents who do not currently have diabetes. These oral glucose tolerance test values were collected from the medical record and were completed during mid gestation (24-28 weeks’ gestation) according to Michigan Medicine guidelines. Expectant parents were instructed to consume a 50-gram liquid glucose drink in under 5 minutes. One hour later, blood was collected via venipuncture and glucose was determined by Michigan Medicine laboratory personnel.

#### Child Birth Weight values

Infant birth weight values in grams were abstracted directly from the pediatric note following delivery of the child. Infant birth weight is recorded as grams.

#### Other Covariates

The data comprised in the PRESS study included validated instruments for repeated measures for dietary quality (DSQ paper here), perceived stress (PSS-4 paper here), nausea and vomiting of pregnancy (PUQ-24 Paper HERE), and disordered eating behavior (EDEQ-s paper here). Sociodemographic and baseline behavioral information was collected upon enrolling in the study. This included data about parity, baseline diabetes and hypertension status, self-reported pre-pregnancy BMI, physical activity, relationship status, smoking exposure, sleeping duration, as well as race/ethnicity, income, and parent level of education. Final models were adjusted for XXXX.

### Statistical Analyses

All exposure and outcome values were assessed for normality through histograms and residual plots. Values that were not normally distributed were expressed as median ± inter-quartile range (IQR). Bivariate analysis was completed by comparison of the exposures and outcomes of interest with   
Results:

As stated previously, we excluded individuals with pre-existing diabetes, inaccurate or missing timing data, loss to follow up, those who delivered multiples, and those without outcome data at the time of the analysis. This resulted in 102 individuals with 54 individuals who have repeated data for trimesters 2 and 3 (Figure 1).

As expressed in table 1, PRESS participants tended to be older (age ± ), highly educated (% with higher edu), and have high household incomes.