with healthy non-obese participants only the metabolically unhealthy obese participants had elevated odds of incident depression (OR=1.56, 95% CI, 1.09 – 2.22), but not their metabolically healthy obese counterparts (OR=1.45, 95% CI, 0.92 – 2.30) nor unhealthy non-obese participants (OR=1.38, 95% CI, 0.98 – 1.94). In further analysis we examined the associations between individual metabolic risk factors and depression. There was a dose-response association between the number of metabolic risk factors and risk of depression, although the risk only became significant in participants with more than one risk factor. Adverse triglycerides, impaired glycemic control, and low grade inflammation were associated with depression at follow-up in models adjusted for age, sex and baseline CES-D score.

**Conclusion** The association between obesity and risk of depressive symptoms appears to be partly dependent on metabolic health, although further work is required to confirm these findings.

**Population Based Studies: Intergenerational**

**OP61** IS MATERNAL IRON STATUS ASSOCIATED WITH OFFSPRING’S BLOOD PRESSURE AND ADIPOSITY? A MENDELIAN RANDOMIZATION STUDY

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**Background** Iron deficiency during pregnancy is a common problem. Experimental animal studies suggest that mothers deficient in iron during pregnancy are more likely to have offspring who become obese and have higher blood pressure. The use of random assignment of genes from parents to offspring can provide a method for assessing the causal impact of nutritional exposures, which is less likely to be influenced by confounding and reverse causality. The C282Y mutation in the HFE gene is robustly associated with iron stores, with those who carry the mutation having higher iron stores. Thus, this variant could be used as an instrumental variable to examine whether the association of maternal iron with offspring body mass index (BMI), waist circumference (WC) and blood pressure (BP) is causal.

**Methods** We conducted a Mendelian randomization study to examine the association between maternal iron status with offspring adiposity and BP in adulthood. Instrumental variable (IV) analysis, using maternal C282Y as a genetic instrument for mother’s ferritin, was performed. IV analysis uses the proportion of the variation in maternal ferritin that is explained by C282Y to provide an unconfounded estimate of the relationship with offspring outcomes. The results were compared to the results of multivariable ordinary least squares (OLS) regression examining the same relationship. Male and female offspring of mothers from the UK Women Cohort Study (UKWCS) were approached, of whom 348 with mean age of 41 years completed the study. About half were offspring of C282Y carriers. Offspring’s BP, height and weight were measured at their local medical practice. Participants were also asked to self-measure their WC at home.

**Results** Maternal C282Y was associated with maternal ferritin (mean difference per allele=84 g/l, 95% CI 51, 137, P=0.002). Using IV analyses, maternal ferritin was not associated with offspring’s BP, BMI or WC. The first stage F statistic for the strength of the instrument was 10 (Kleibergen-Paap rk LM P-value=0.009). Maternal ferritin was associated with offspring diastolic BP, WC and BMI in univariable, but not in multivariable OLS analysis. There was no strong statistical evidence of a difference between the OLS and the IV models coefficients for any of the outcomes considered.

**Conclusion** We found no association between maternal iron status and offspring’s BP and adiposity using both multivariable OLS and IV modeling with maternal C282Y mutation as the instrument. Further exploration of this relationship is needed in larger studies that have genetic variation assessed in both mother and offspring.