**OBJECTIVE**

- The study is a longitudinal panel analysis of survey and lab data collected as part of the HONU heart health screenings in 2009 and 2011. Our study sample consisted of 1,859 adult residents who attended both screenings.
- The primary exposures of interest were change (from baseline 2009 screening) in individual lifestyle risk factors and a composite optimal lifestyle score (OLS). The OLS score was created by summing two points for each of the following: non-smoker, ≥150 min/week of moderate equivalent physical activity, 0-14 alcoholic drinks/wk, BMI < 30kg/m², and ≥5 servings per day of fruits and vegetables.
- Each risk and the OLS were categorized as improving, declining or staying the same.
- Frequencies and means (SD) were used to describe the sample. Linear regression models predicting changes in HDL and Cholesterol/HDL over 2 years were run with the change categories for the OLS and its components as the predictors. Age stratified models were also run. A final reduced model is presented.

**METHODS**

**Model 1: Lifestyle Components**

- **Physical Activity**
  - Improved (17%): -0.04 (0.06), 0.49, -0.05 (0.62), 0.941
  - Declined (8%): 0.11 (0.06), 0.069, 0.94 (0.66), 0.153

- **Smoking**
  - Improved (2%): -0.49 (0.15), 0.001, -0.01 (1.59), 0.997
  - Declined (1%): 0.15 (0.23), 0.520, -1.84 (2.49), 0.459

- **Obesity**
  - Improved (5%): -0.25 (0.08), 0.002, 3.21 (0.87), <0.001
  - Declined (4%): 0.07 (0.08), 0.386, -2.67 (0.88), 0.002

**Model 2: Composite score**

- Improved ≥ 1 factor (34%): -0.90 (0.05), 0.069, 0.86 (0.51), 0.089
- Declined ≥ 1 factor (15%): 0.09 (0.06), 0.088, 0.12 (0.59), 0.845

**RESULTS**

- Mean (se) change in HDL and cholesterol from 2009 was -1.8 (0.2) and -5.6 (0.7) respectively.
- On average, those who were obese in 2009 and not obese in 2011 lowered their Chol/HDL ratio by 0.25 and increased their HDL by 3.21mg/dl more than those with stable BMI.
- Participants who quit smoking decreased their Chol/HDL ratio on average 0.49 more than those whose smoking status remained unchanged.
- Participants younger than 50 years who increased their physical activity experienced an average(se) decrease in their Chol/HDL ratio of 0.19(0.1) more than those with no change in physical activity (p-value = 0.045).
- Participants 50 years or older who decreased physical activity experienced an increase in average (se) Chol/HDL ratio of 0.19(0.1) more than those with no change in physical activity (p-value = 0.023).
- A combination of improvements in any of the three factors (smoking, BMI or physical activity) showed a moderate impact on raising HDL compared to those who remained stable.

**CONCLUSIONS**

- After adjustment for demographic and clinical factors, weight loss was the strongest lifestyle predictor of increased HDL in this rural sample of adults.
- Quitting smoking was associated with significantly improved Total/HDL cholesterol ratio and decreased physical activity was associated with (borderline) significantly poorer Total/HDL cholesterol ratio.
- In conjunction with high quality CVD preventive medical care, continued implementation of programs that promote and maintain healthy lifestyle habits may result in more favorable population-level lipid profiles.

*The authors have no conflicts of interest to report.*