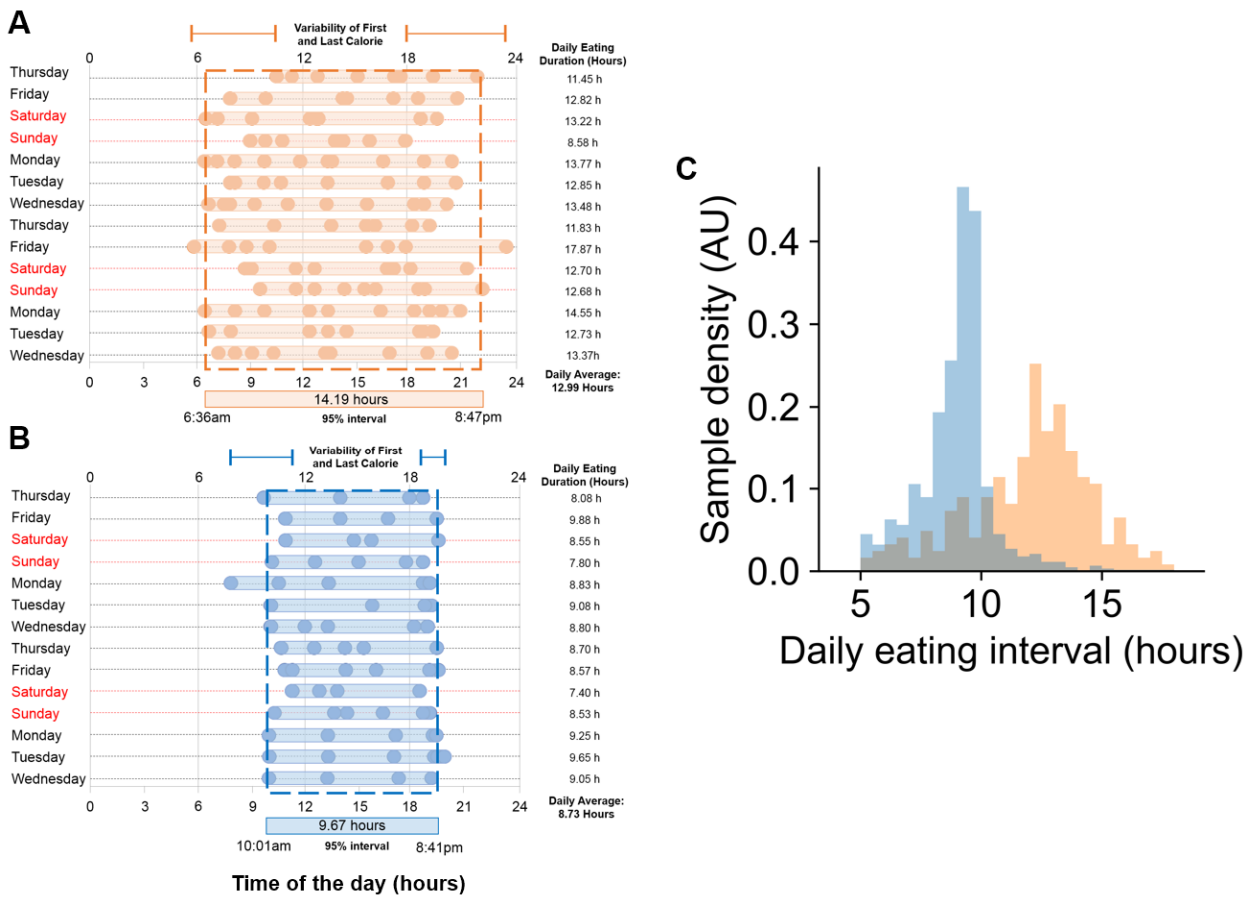
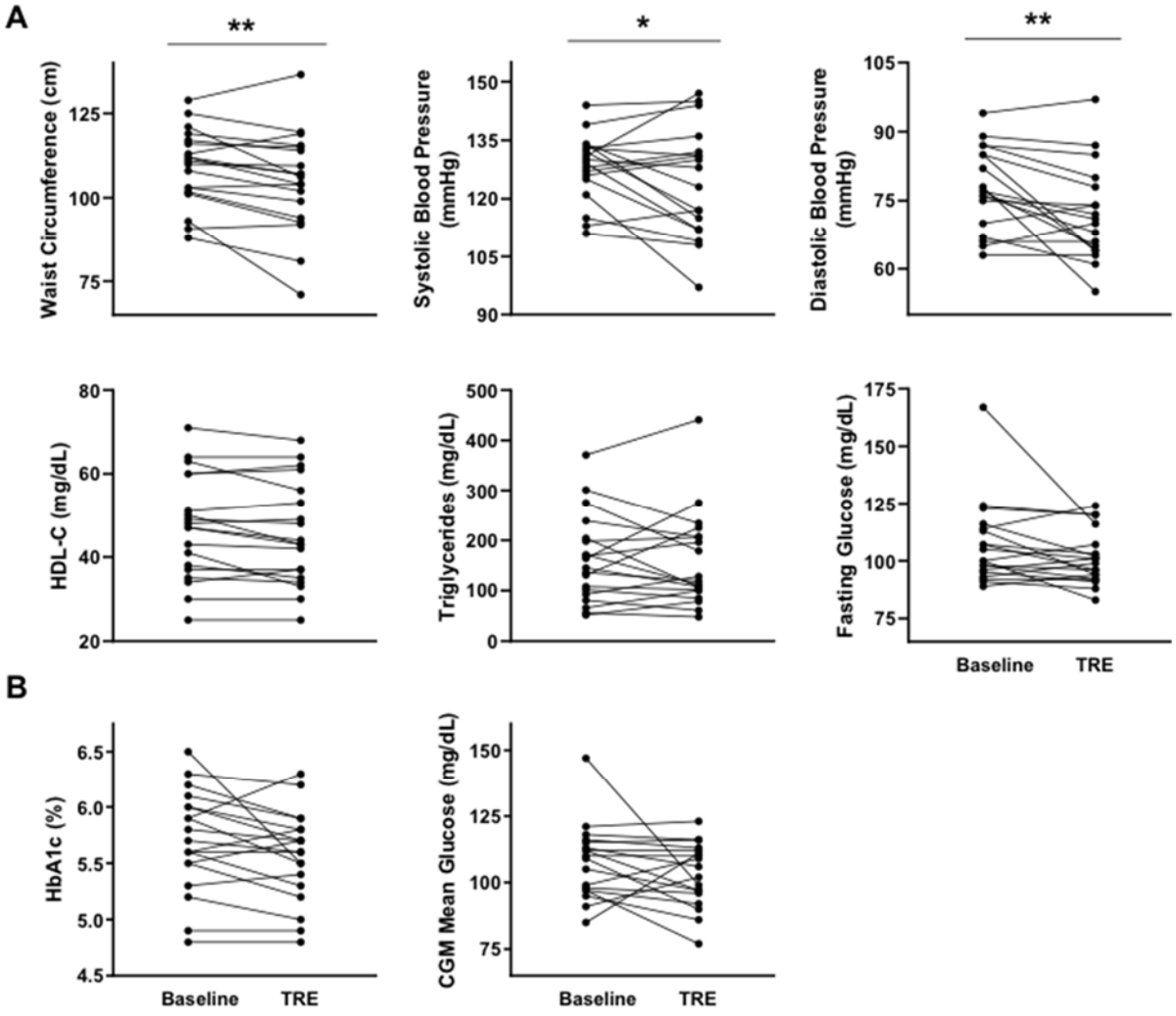
## Supplemental Information




**Supplemental Figure 1. Feedograms and calculation of eating windows at baseline and end of the intervention. Related to Figure 2.** Representative Feedogram (timeline of food intake over several days; 14 d in this example) of a participant at **(A)** baseline and **(B)** during the last two weeks of intervention. Each line represents one day and each small circle represents one calorie ingestion event. The "daily eating window" is the shaded area spanning the first and the last caloric event with daily duration and average noted on the right. The dotted rectangle around the daily entries and the shaded rectangle at the bottom of the graph represents the 95% eating window over 14 d monitoring period. Note the relatively longer daily eating window and 95% eating window during baseline, which reduced during intervention due to delay in the first calorie, advance of the

last calorie, and reduced day to day variance in the first and last caloric events. **(C)** For each of the 19 study participants, each day of their myCircadianClock feedogram data was used to calculate the first and last time that they consumed food or non-water beverages, on a 4 am to 4 am basis at baseline (orange) and during intervention (blue). The daily eating interval was calculated as the number of hours between first and last consumption for that day. Here we plot the distribution of daily eating intervals separately for baseline and intervention for all 19 participants. Days that participants did not meet good logging criteria (at least 2 times entered a minimum of 5 h apart) were excluded. This histogram represents 1498 total person-days; 246 in Baseline, 1252 in Intervention period. The x-axis of the histogram is divided up into half-hour bins of eating interval. The y-axis shows the number of histogram counts in that bin divided by the total number of counts for that experimental period, producing a measure of sample density for that histogram bin. AU, arbitrary units.




**Supplemental Figure 2. Changes in measures of metabolic syndrome and glucose levels at baseline and end of TRE intervention. Related to Figure 3 and Table 1.** (A) Factors of metabolic syndrome at baseline and end of TRE intervention. (B) Markers of glucose (CGM mean glucose levels and HbA1c) did not significantly change with TRE intervention but decreased in many individuals. CGM mean glucose decreased by 4.62% but was not a significant change between baseline and TRE ($p = 0.245$). HbA1c decreased by 2% but did not reach significance ($p=0.058$).

**Supplemental Table 1. Individual participant baseline data. Related to Figures 3 and 4, and Table 1.**

| Demographics and Anthropometric data | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Participant ID** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| **Age (yrs)** | 48 | 42 | 54 | 51 | 58 | 63 | 67 | 69 | 79 | 43 | 56 | 64 | 71 | 39 | 62 | 73 | 61 | 67 | 52 |
| **Sex** | M | M | F | M | M | M | F | M | M | F | F | M | M | M | M | M | M | F | F |
| **Race** | White | Other or Mixed | White | UK | White | White | Asian | White | White | White | Other or Mixed | White | White | White | White | White | White | White | White |
| **Ethnicity** | NH | H | H | UK | NH | UK | NH | NH | NH | NH | NH | NH | NH | NH | NH | NH | NH | NH | H |
| **95% Eating Interval (h)** | 15.24 | 14.66 | 15.77 | 14.72 | 13.94 | 15.71 | 14.36 | 15.93 | 14.50* | 14.03 | 14.19 | 13.48 | 15.92 | 14.3 | 18.4 | 16.2 | 15.18 | 15 | 15.3 |
| **Eating Interval -Intervention** | 10:00-20:00 | 08:30-18:30 | 08:30-18:30 | 10:00-20:00 | 08:00-18:00 | 08:00-18:00 | 10:00-20:00 | 09:30-19:30 | 08:00-18:00 | 09:00-19:00 | 10:00-20:00 | 08:00-18:00 | 09:00-19:00 | 10:00-20:00 | 09:30-19:30 | 10:00-20:00 | 09:00-19:00 | 09:00-19:00 | 09:00-19:00 |
| **95% Eating Interval – Intervention (h)** | 9.82 | 10.87 | 11.90 | 10.08 | 10.23 | 9.70 | 9.86 | 9.78 | 9.78 | 11.93 | 9.67 | 9.77 | 10.28 | 9.80 | 11.59 | 13.21 | 13.07 | 11.78 | 10.64 |
| **Weight (kg)** | 118.3 | 106.25 | 87.29 | 116.23 | 144.4 | 114.5 | 62.07 | 89.31 | 101.17 | 81.19 | 68.52 | 108.7 | 108.3 | 93.3 | 82.8 | 105 | 103.5 | 74.3 | 93.8 |
| **BMI (kg/m$^2$)** | 38.6 | 36.8 | 35.3 | 36.9 | 45.8 | 35.3 | 27.8 | 26.8 | 33 | 28 | 27.8 | 31.3 | 33 | 32.8 | 27.9 | 35.4 | 34.8 | 29.2 | 31.6 |
| **% BF** | 36.6 | 31.7 | 39.2 | 33.4 | 43.2 | 35.4 | 39.6 | 35.8 | 39 | 33.5 | 36.4 | 34.4 | 35.4 | 31.4 | 29.4 | 37.1 | 37.11 | 40.2 | 46.9 |
| **Waist Circ. (cm)** | 112 | 110 | 103 | 117 | 128.9 | 116 | 90.8 | 108 | 121 | 93 | 88 | 119 | 111 | 112 | 101 | 113 | 125 | 102 | 103 |
| **Visceral Fat Rating** | 21 | 16 | 11 | 19 | 27 | 21 | 10 | 18 | 24 | 6 | 8 | 19 | 21 | 14 | 15 | 24 | 21 | 11 | 11 |
| **Mean Blood Glucose (CGM) (mg/dL)** | 112 | 121 | 97 | 116 | 147 | 105 | 113 | 112 | 115 | 97 | 95 | 91 | 109 | 99 | 97 | 118 | 98 | 85 | 110 |
| **Fasting Glucose (mg/dL)** | 98 | 98 | 105 | 91 | 167 | 107 | 89 | 92 | 124 | 100 | 113 | 100 | 123 | 96 | 116 | 114 | 107 | 95 | 93 |
| **Insulin (uIU/mL)** | 18 | 7 | 23 | 22 | 67 | 23 | 12 | 8 | 12 | 4 | 19 | 12 | 10 | 14 | 16 | 26 | 19 | 12 | 12 |
| **HbA1c (%)** | 5.2 | 5.6 | 5.5 | 5.5 | 6.5 | 6 | 5.6 | 5.6 | 5.9 | 4.9 | 6.1 | 5.7 | 6.3 | 4.8 | 5.9 | 6.2 | 5.8 | 5.3 | 6 |
| **HOMA-IR** | 4.36 | 1.69 | 5.96 | 4.94 | 27.63 | 6.08 | 2.64 | 1.82 | 3.67 | 0.99 | 5.3 | 2.96 | 3.04 | 3.32 | 4.58 | 7.32 | 5.02 | 2.81 | 2.76 |
| **SBP (mmHg)** | 134 | 133 | 121 | 134 | 144 | 125 | 127 | 126 | 123 | 139 | 128 | 129 | 115 | 132 | 113 | 133 | 111 | 131 | 130 |
| **DBP (mmHg)** | 87 | 87 | 78 | 89 | 85 | 77 | 63 | 67 | 80 | 94 | 85 | 76 | 76 | 82 | 66 | 77 | 75 | 65 | 70 |
| **TC (mg/dL)** | 213 | 152 | 293 | 168 | 172 | 193 | 204 | 148 | 178 | 190 | 193 | 147 | 189 | 126 | 148 | 210 | 169 | 171 | 183 |
| **LDL-C (mg/dL)** | 149 | 84 | 197 | 64 | 71 | 114 | 114 | 73 | 80 | 114 | 126 | 73 | 107 | 67 | 81 | 121 | 109 | 96 | 102 |
| **Non-HDL-C (mg/dL)** | 176 | 117 | 245 | 138 | 131 | 155 | 133 | 84 | 135 | 127 | 142 | 113 | 129 | 101 | 101 | 150 | 119 | 122 | 136 |
| **LDL-p (nmol/L)** | 2141 | 1264 | 2479 | 1775 | 1283 | 1801 | 1294 | 636 | 1520 | 773 | 1448 | 1506 | 1195 | N/A | 947 | 1645 | 1294 | 1360 | 1437 |
| **HDL-C (mg/dL)** | 37 | 35 | 48 | 30 | 41 | 38 | 71 | 64 | 43 | 63 | 51 | 34 | 60 | 25 | 47 | 60 | 50 | 49 | 47 |
| **TG (mg/dL)** | 136 | 164 | 239 | 371 | 301 | 204 | 93 | 56 | 275 | 66 | 81 | 198 | 108 | 169 | 102 | 145 | 52 | 131 | 171 |
| **hs-CRP (mg/L)** | 0.7 | 0.6 | 2.3 | 0.7 | 4.1 | 0.5 | 3 | 1.7 | 0.29 | 1 | 3.6 | 1.2 | 2.9 | N/A | 0.5 | 0.29 | 17.6 | 0.4 | 3.2 |
| **ALT (units/L)** | 24 | 41 | 27 | 23 | 25 | 38 | 15 | 23 | 18 | 12 | 54 | 42 | 25 | 21 | 36 | 40 | 24 | 34 | 23 |
| **AST (units/L)** | 19 | 24 | 22 | 25 | 33 | 29 | 24 | 29 | 24 | 18 | 45 | 36 | 22 | 17 | 33 | 30 | 28 | 27 | 24 |

Green = factor improved at the end of intervention, red = worsened at the end of intervention, white = no change between baseline and intervention, grey = missing data at baseline and/or end of intervention. * = self-reported. H, Hispanic, NH, not Hispanic, UK, unknown, BMI, body mass

index, BF, body fat, SBP, systolic blood pressure, DBP, diastolic blood pressure, HDL-C, high-density lipoprotein cholesterol, LDL-C, low-density lipoprotein cholesterol, LDL-p, low-density lipoprotein particle number, TG, triglyceride, TC, total cholesterol, hs-CRP, high-sensitivity C-reactive protein, ALT, alanine aminotransferase, AST, aspartate aminotransferase, CGM, continuous glucose monitor, HbA1c, hemoglobin A1c, HOMA-IR, Homeostatic Model Assessment of Insulin Resistance, PSQI, Pittsburgh Sleep Quality Index. HOMA-IR is obtained using the following equation: (fasting glucose*fasting insulin)/405.

**Supplemental Table 2. Medications used by participants which are known to impact the components of metabolic syndrome. Related to STAR methods.** Participants did not change their medications (including dosage) during the study. (Note: numbers in the first column are participant ID numbers).

| PID | **Statin** | Omega-3 | Fibrate | Niacin | Ezetimibe | **Anti-hypertensive** | Metformin | Sulfonyl-urea |
|---|---|---|---|---|---|---|---|---|
| 1 | **No** | No | No | No | No | **Yes** | No | No |
| 2 | **Yes** | No | No | No | No | **Yes** | No | No |
| 3 | **No** | No | No | No | No | **No** | No | No |
| 4 | **Yes** | No | No | No | No | **Yes** | No | No |
| 5 | **Yes** | No | No | No | Yes | **Yes** | No | Yes |
| 6 | **Yes** | No | No | No | No | **Yes** | No | No |
| 7 | **Yes** | No | No | No | No | **No** | Yes | No |
| 8 | **Yes** | Yes | No | No | No | **Yes** | No | No |
| 9 | **Yes** | No | No | No | No | **Yes** | No | No |
| 10 | **No** | No | No | No | No | **No** | No | No |
| 11 | **No** | No | No | No | No | **No** | No | No |
| 12 | **Yes** | Yes | Yes | Yes | No | **No** | No | No |
| 13 | **Yes** | No | No | No | No | **Yes** | No | No |
| 14 | **Yes** | Yes | No | No | No | **No** | No | No |
| 15 | **Yes** | No | No | No | No | **Yes** | No | No |
| 16 | **Yes** | No | No | No | Yes | **No** | No | No |
| 17 | **Yes** | No | No | No | No | **Yes** | No | No |
| 18 | **Yes** | Yes | No | No | No | **Yes** | No | No |
| 19 | **Yes** | No | No | No | No | **Yes** | No | No |
| Total (%) | **15 (79%)** | 4 (21%) | 1 (5%) | 1 (5%) | 2 (11%) | **12 (63%)** | 1 (5%) | 1 (5%) |

**Supplemental Table 3. Changes in weight do not explain changes in cardiometabolic health outcomes based on mixed linear model analysis. Related to Table 1.**

| Outcome variable | Value | Intercept | Condition [T.Intervention] | Weight | Weight: Condition [T.Intervention] | Eating Interval | Eating Interval: Condition [T.Intervention] | Weight: Eating Interval | Weight: Eating Interval: Condition [T.Intervention] |
|---|---|---|---|---|---|---|---|---|---|
| % Body Fat | Coef. | 42.366 | -8.147 | -0.008 | 0.012 | -0.696 | 0.413 | 0.002 | 0 |
| | Std.Err. | 20.216 | 21.209 | 0.095 | 0.1 | 1.343 | 1.714 | 0.006 | 0.008 |
| | z | 2.096 | -0.384 | -0.079 | 0.125 | -0.518 | 0.241 | 0.308 | -0.053 |
| | P>\|z\| | **0.036** | 0.701 | 0.937 | 0.901 | 0.604 | 0.809 | 0.758 | 0.958 |
| SBP (mmHg) | Coef. | 288.474 | -48.455 | -0.776 | 0.142 | -11.98 | 1.054 | 0.058 | 0.003 |
| | Std.Err. | 112.336 | 174.078 | 0.537 | 0.821 | 7.687 | 15.694 | 0.037 | 0.074 |
| | z | 2.568 | -0.278 | -1.447 | 0.173 | -1.558 | 0.067 | 1.567 | 0.036 |
| | P>\|z\| | **0.01** | 0.781 | 0.148 | 0.863 | 0.119 | 0.946 | 0.117 | 0.971 |
| DBP (mmHg) | Coef. | 207.595 | -311.287 | -0.568 | 1.4 | -10.17 | 25.233 | 0.045 | -0.116 |
| | Std.Err. | 115.482 | 155.54 | 0.539 | 0.728 | 7.883 | 13.152 | 0.037 | 0.062 |
| | z | 1.798 | -2.001 | -1.054 | 1.924 | -1.29 | 1.919 | 1.218 | -1.876 |
| | P>\|z\| | 0.072 | **0.045** | 0.292 | 0.054 | 0.197 | 0.055 | 0.223 | 0.061 |
| BMI ($kg/m^2$) | Coef. | 16.01 | -3.509 | 0.089 | 0.001 | -0.282 | 0.156 | 0.001 | 0 |
| | Std.Err. | 12.707 | 13.596 | 0.06 | 0.064 | 0.854 | 1.097 | 0.004 | 0.005 |
| | z | 1.26 | -0.258 | 1.499 | 0.022 | -0.331 | 0.142 | 0.152 | 0.045 |
| | P>\|z\| | 0.208 | 0.796 | 0.134 | 0.983 | 0.741 | 0.887 | 0.879 | 0.964 |
| Waist Circ (cm) | Coef. | 36.922 | 216.775 | 0.421 | -1.1 | 1.76 | -22.241 | -0.014 | 0.109 |
| | Std.Err. | 79.813 | 97.333 | 0.375 | 0.463 | 5.442 | 8 | 0.026 | 0.038 |
| | z | 0.463 | 2.227 | 1.125 | -2.377 | 0.323 | -2.78 | -0.546 | 2.853 |
| | P>\|z\| | 0.644 | **0.026** | 0.26 | **0.017** | 0.746 | **0.005** | 0.585 | **0.004** |
| Visceral Fat Rating | Coef. | 16.206 | 2.724 | 0.002 | -0.007 | -1.626 | -0.976 | 0.008 | 0.004 |
| | Std.Err. | 25.661 | 23.056 | 0.121 | 0.109 | 1.755 | 1.832 | 0.008 | 0.009 |
| | z | 0.632 | 0.118 | 0.014 | -0.067 | -0.927 | -0.533 | 0.914 | 0.479 |
| | P>\|z\| | 0.528 | 0.906 | 0.989 | 0.947 | 0.354 | 0.594 | 0.361 | 0.632 |
| TC (mg/dL) | Coef. | 392.713 | -234.437 | -0.976 | 1.162 | -12.88 | 15.953 | 0.06 | -0.087 |
| | Std.Err. | 408.262 | 467.588 | 1.928 | 2.209 | 27.793 | 38.31 | 0.132 | 0.181 |
| | z | 0.962 | -0.501 | -0.507 | 0.526 | -0.464 | 0.416 | 0.453 | -0.481 |
| | P>\|z\| | 0.336 | 0.616 | 0.612 | 0.599 | 0.643 | 0.677 | 0.65 | 0.631 |
| LDL-C (mg/dL) | Coef. | 540.246 | -282.489 | -2.097 | 1.539 | -27.21 | 13.813 | 0.131 | -0.089 |
| | Std.Err. | 270.139 | 317.417 | 1.276 | 1.503 | 18.275 | 26.808 | 0.087 | 0.127 |
| | z | 2 | -0.89 | -1.642 | 1.024 | -1.489 | 0.515 | 1.51 | -0.704 |
| | P>\|z\| | **0.046** | 0.373 | 0.1 | 0.306 | 0.136 | 0.606 | 0.131 | 0.482 |
| Non-HDL-C (mg/dL) | Coef. | 277.231 | -275.289 | -0.636 | 1.336 | -10.21 | 20.772 | 0.046 | -0.108 |
| | Std.Err. | 386.74 | 442.84 | 1.822 | 2.092 | 26.337 | 36.243 | 0.124 | 0.172 |
| | z | 0.717 | -0.622 | -0.349 | 0.638 | -0.387 | 0.573 | 0.367 | -0.627 |
| | P>\|z\| | 0.473 | 0.534 | 0.727 | 0.523 | 0.698 | 0.567 | 0.714 | 0.531 |

SBP, systolic blood pressure, DBP, diastolic blood pressure, BMI, body mass index, TC, total cholesterol, HDL-C, high-density lipoprotein cholesterol, LDL-C, low-density lipoprotein cholesterol.