Supplementary table 1: The missing data of covariates and their processing.

|  |  |  |  |
| --- | --- | --- | --- |
| Covariant | complete data | Missing data | Process |
| Age | 3171 | 0 |  |
| Gender  | 3171 | 0 |  |
| Race  | 3171 | 0 |  |
| Ratio of family income to poverty | 2877 | 264 | Not recorded |
| Time of detection | 3171 | 0 |  |
| Sedentary activity | 3111 | 60 | Weighted mean |
| Waist circumference | 3127 | 24 | Weighted mean |
| BMI  | 3141 | 30 | Not recorded |

BMI, body mass index.

Supplementary table 2: Association between covariates and VAT mass.

|  |  |  |
| --- | --- | --- |
| covariates | Exp(beta),95%CI | P value  |
| Age | 9.09 (6.94, 11.25)  | <0.0001  |
| Gender  |  |  |
| Boys | 0  | 0  |
| Girls | -23.45 (-33.15, -13.76)  | <0.0001  |
| Race |  |  |
| Mexican American | 0  | 0  |
| Other Hispanic | -39.70 (-61.22, -18.18)  | 0.0003  |
| Non-Hispanic White | -41.06 (-55.07, -27.06)  | <0.0001  |
| Non-Hispanic Black | -74.28 (-92.24, -56.32)  | <0.0001  |
| Other Race | -41.88 (-62.38, -21.37)  | <0.0001  |
| Ratio of family income to poverty |  |  |
| <1.3 | 0  | 0  |
| 1.3-1.8 | -0.26 (-17.58, 17.07)  | 0.9767  |
| >1.8 | -28.85 (-39.96, -17.75)  | <0.0001  |
| Not recorded | -9.38 (-30.67, 11.91)  | 0.3878  |
| Time of detection  |  |  |
| November 1 through April 30 | 0  | 0  |
| May 1 through October 31 | -19.14 (-28.86, -9.42)  | 0.0001  |
| Sedentary activity | 0.03 (-0.00, 0.06)  | 0.0846  |
| Waist circumference | 7.46 (7.28, 7.65)  | <0.0001  |
| BMI |  |  |
| Underweight | 0  | 0  |
| Normal weight | 25.34 (6.23, 44.44) | 0.0094  |
| Overweight | 122.49 (102.08, 142.89)  | <0.0001  |
| Obese | 265.23 (245.19, 285.27)  | <0.0001  |
| Not recorded | 105.63 (64.61, 146.66)  | <0.0001  |
| Serum vitamin D | -1.23 (-1.44, -1.02)  | <0.0001  |
| Deficiency | 0  | 0  |
| Insufficiency | -23.42 (-34.94, -11.90)  | <0.0001  |
| Sufficiency | -59.26 (-72.50, -46.02)  | <0.0001  |

BMI, body mass index.

Supplementary table 3: The adjusting roles of potential confounders on the estimates of serum vitamin D on VAT.

|  |  |  |  |
| --- | --- | --- | --- |
| +/-covariates | Basic model | Complete model | Selected covariates |
| Age | -1.2407 | -0.3489 |  |
| Gender | -1.2110 | -0.3592 |  |
| Race | -1.6295 \* | -0.1253 \* | Yes  |
| Ratio of family income to poverty | -1.1480 | -0.3672 |  |
| Time of detection | -1.1962 | -0.3565 |  |
| Sedentary activity | -1.2211 | -0.3457 |  |
| Waist circumference | -0.2697 \* | -0.6627 \* | Yes  |
| BMI | -0.3497 \* | -0.3627 | Yes  |

\*The change is more than 10% compared with the initial regression coefficient.