

S1 description the statistical model of this study.

The pre- and postintervention values based on the index date were compared using paired t-tests. To analyze the interaction and estimated value (EV), a linear mixed model was used. Age, sex, income, region of residence, thyroid cancer, and time of measurement were used as the independent variables and fixed effects. The random effects of BMI, systolic blood pressure, diastolic blood pressure, fasting blood glucose, total cholesterol, smoking, alcohol consumption, and CCI scores were assessed. A first-order autoregressive model was selected as the repeated covariance type, considering the correlation of each participant's iteration. The linear mixed model analysis is as follows.

$$Y_i = X_{i1}\beta_1 + \dots + X_{ip}\beta_p + Z_{i1}u_1 + \dots + Z_{iq}u_q + e_i, \text{ for all } i = 1, \dots, n$$

where $Y = (Y_1, \dots, Y_n)'$, X the $n \times p$ matrix of covariates with fixed effects $\beta = (\beta_1, \dots, \beta_p)'$, Z the $n \times q$ matrix of covariates with random effects $u = (u_1, \dots, u_q)' \sim N(0, \tau I_q)$, and the residual error vector $e = (e_1, \dots, e_n)' \sim N(0, \tau I_n)$.

Table S2 Difference in mean values of BMI and blood pressure between pre and 1-year post of thyroid cancer in thyroid cancer I and comparison I group according to obesity

| Characteristics | Thyroid cancer I | | | Comparison I | | | Interaction‡ | Linear mixed model¶ | |
|-----------------------|------------------|----------------|---------|----------------|----------------|---------|--------------|---------------------|---------|
| | Previous | Post 1yr | P-value | Previous | Post 1yr | P-value | P-value | EV§ | P-value |
| | (mean, SD) | (mean, SD) | | (mean, SD) | (mean, SD) | | | | |
| Underweight (n= 100) | | | | | | | | | |
| BMI | 17.93 ± 0.50 | 18.69 ± 1.69 | 0.060 | 17.65 ± 0.76 | 18.09 ± 1.21 | <0.001* | 0.225 | 0.275 | 0.298 |
| SBP | 118.65 ± 18.37 | 121.80 ± 11.95 | 0.467 | 116.10 ± 16.09 | 116.44 ± 15.12 | 0.837 | 0.172 | -0.843 | 0.757 |
| DBP | 75.60 ± 11.21 | 75.65 ± 8.54 | 0.986 | 71.93 ± 10.20 | 73.95 ± 9.89 | 0.115 | 0.190 | 2.602 | 0.137 |
| Normal (n= 3,340) | | | | | | | | | |
| BMI | 21.37 ± 1.18 | 21.49 ± 1.56 | 0.101* | 21.35 ± 1.17 | 21.58 ± 1.57 | <0.001* | 0.063 | 0.010 | 0.869 |
| SBP | 120.52 ± 15.50 | 120.10 ± 14.48 | 0.477 | 118.97 ± 15.28 | 119.80 ± 14.63 | 0.004* | 0.878 | 0.061 | 0.880 |
| DBP | 75.34 ± 10.16 | 74.80 ± 9.88 | 0.193 | 74.00 ± 10.19 | 74.57 ± 9.79 | 0.005* | 0.240 | 0.571 | 0.035 |
| Overweight (n= 2,855) | | | | | | | | | |
| BMI | 23.97 ± 0.56 | 23.90 ± 1.42 | 0.220 | 23.97 ± 0.57 | 23.99 ± 1.30 | 0.444 | 0.149 | -0.001 | 0.979 |
| SBP | 122.94 ± 14.72 | 122.73 ± 13.84 | 0.746 | 122.83 ± 15.25 | 123.13 ± 14.57 | 0.360 | 0.399 | -0.335 | 0.460 |
| DBP | 76.74 ± 9.65 | 76.49 ± 9.83 | 0.601 | 76.44 ± 10.09 | 76.26 ± 9.61 | 0.420 | 0.506 | 0.322 | 0.281 |
| Obese I (n= 3,310) | | | | | | | | | |

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|-------------------|----------------|----------------|---------|----------------|----------------|---------|-------|--------|-------|
| BMI | 26.76 ± 1.30 | 26.54 ± 1.83 | <0.001* | 26.70 ± 1.26 | 26.47 ± 1.72 | <0.001* | 0.697 | 0.066 | 0.315 |
| SBP | 127.42 ± 14.19 | 126.68 ± 13.28 | 0.221 | 127.51 ± 15.61 | 126.63 ± 14.79 | 0.006* | 0.623 | -0.035 | 0.935 |
| DBP | 79.43 ± 10.10 | 78.81 ± 8.66 | 0.160 | 79.51 ± 10.32 | 78.54 ± 9.65 | <0.001* | 0.356 | -0.017 | 0.952 |
| Obese II (n= 370) | | | | | | | | | |
| BMI | 31.88 ± 2.72 | 31.18 ± 3.00 | 0.002* | 31.76 ± 2.28 | 31.07 ± 2.45 | <0.001* | 0.921 | 0.192 | 0.545 |
| SBP | 133.09 ± 18.46 | 130.89 ± 14.22 | 0.255 | 131.00 ± 16.21 | 129.73 ± 15.13 | 0.234 | 0.680 | 0.052 | 0.971 |
| DBP | 82.91 ± 10.26 | 81.65 ± 9.49 | 0.347 | 81.12 ± 10.57 | 80.16 ± 9.64 | 0.185 | 0.902 | 0.878 | 0.323 |

Abbreviations: BMI, body mass index, kg/m²; CCI, Charlson comorbidity index; EV, Estimated value; SBP, systolic blood pressure; DBP, diastolic blood pressure

* Paired t-test, Significance at P < 0.05/3

† Linear mixed model, Significance at P < 0.05/3

‡ Interaction effects between time and group.

§ Estimated value of linear mixed model for thyroid cancer I group based on the comparison I group.

¶ Fixed effects were age, sex, income, region of residence, thyroid cancer, and time of measurement. Random effects were BMI, systolic blood pressure, diastolic blood pressure, fasting blood glucose, total cholesterol, smoking, alcohol consumption, and CCI scores.

Table S3 Difference in mean values of BMI and blood pressure between pre and 2-year post of thyroid cancer in thyroid cancer II and II group according to obesity

| Characteristics | Thyroid cancer II | | | Comparison II | | | Interaction‡ | Linear mixed model¶ | |
|------------------------|-------------------|----------------|---------|----------------|----------------|---------|--------------|---------------------|---------|
| | Previous | Post 2yr | P-value | Previous | Post 2yr | P-value | P-value | EV§ | P-value |
| | (mean, SD) | (mean, SD) | | (mean, SD) | (mean, SD) | | | | |
| Underweight (n = 155) | | | | | | | | | |
| BMI | 17.80 ± 0.56 | 18.78 ± 2.07 | 0.008* | 17.70 ± 0.75 | 18.12 ± 1.24 | <0.001* | 0.038† | 0.081 | 0.713 |
| SBP | 117.06 ± 14.81 | 120.19 ± 16.97 | 0.370 | 115.39 ± 14.42 | 115.09 ± 13.42 | 0.812 | 0.461 | 3.995 | 0.023† |
| DBP | 71.77 ± 8.50 | 73.16 ± 11.03 | 0.528 | 72.34 ± 9.69 | 72.18 ± 10.43 | 0.863 | 0.862 | -1.418 | 0.240 |
| Normal (n = 3,625) | | | | | | | | | |
| BMI | 21.44 ± 1.10 | 21.62 ± 1.61 | <0.001* | 21.42 ± 1.09 | 21.65 ± 1.58 | <0.001* | 0.359 | 0.026 | 0.644 |
| SBP | 120.72 ± 15.76 | 120.89 ± 14.49 | 0.774 | 119.57 ± 15.43 | 119.66 ± 14.97 | 0.754 | 0.860 | 0.139 | 0.728 |
| DBP | 75.38 ± 10.03 | 75.13 ± 9.47 | 0.524 | 74.35 ± 10.23 | 74.12 ± 9.66 | 0.246 | 0.979 | 0.464 | 0.081 |
| Overweight (n = 3,155) | | | | | | | | | |
| BMI | 23.96 ± 0.57 | 23.85 ± 1.34 | 0.029 | 23.96 ± 0.57 | 23.96 ± 1.32 | 0.722 | 0.052 | -0.003 | 0.950 |
| SBP | 123.48 ± 15.13 | 123.13 ± 14.10 | 0.588 | 123.12 ± 14.64 | 123.73 ± 14.78 | 0.052 | 0.902 | -0.586 | 0.172 |
| DBP | 77.59 ± 9.82 | 76.55 ± 9.22 | 0.012* | 76.70 ± 9.73 | 76.52 ± 9.86 | 0.408 | 0.313 | 0.762 | 0.006† |
| Obese I (n = 3,435) | | | | | | | | | |

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|--------------------|----------------|----------------|---------|----------------|----------------|---------|-------|--------|-------|
| BMI | 26.74 ± 1.28 | 26.47 ± 1.82 | <0.001* | 26.74 ± 1.28 | 26.51 ± 1.81 | <0.001* | 0.569 | 0.010 | 0.877 |
| SBP | 127.07 ± 13.69 | 125.96 ± 13.80 | 0.063 | 127.19 ± 15.81 | 126.67 ± 14.90 | 0.114 | 0.715 | -0.532 | 0.222 |
| DBP | 79.49 ± 9.88 | 78.26 ± 8.98 | 0.004* | 79.31 ± 10.27 | 78.43 ± 9.60 | <0.001* | 0.953 | 0.348 | 0.231 |
| Obese II (n = 440) | | | | | | | | | |
| BMI | 31.64 ± 1.71 | 31.06 ± 2.43 | 0.004* | 32.00 ± 2.04 | 31.21 ± 2.88 | <0.001* | 0.436 | -0.315 | 0.267 |
| SBP | 127.64 ± 15.39 | 128.15 ± 14.25 | 0.811 | 131.92 ± 16.34 | 130.55 ± 15.51 | 0.158 | 0.953 | -2.457 | 0.073 |
| DBP | 79.70 ± 9.92 | 80.53 ± 8.43 | 0.537 | 81.25 ± 10.57 | 80.29 ± 9.65 | 0.163 | 0.401 | 0.345 | 0.700 |

Abbreviations: BMI, body mass index, kg/m²; CCI, Charlson comorbidity index; EV, Estimated value; SBP, systolic blood pressure; DBP, diastolic blood pressure

* Paired t-test, Significance at P < 0.05/3

† Linear mixed model, Significance at P < 0.05/3

‡ Interaction effects between time and group.

§ Estimated value of linear mixed model for thyroid cancer II group based on the comparison II group.

¶ Fixed effects were age, sex, income, region of residence, thyroid cancer, and time of measurement. Random effects were BMI, systolic blood pressure, diastolic blood pressure, fasting blood glucose, total cholesterol, smoking, alcohol consumption, and CCI scores.