

Supplementary figures

Figure S1

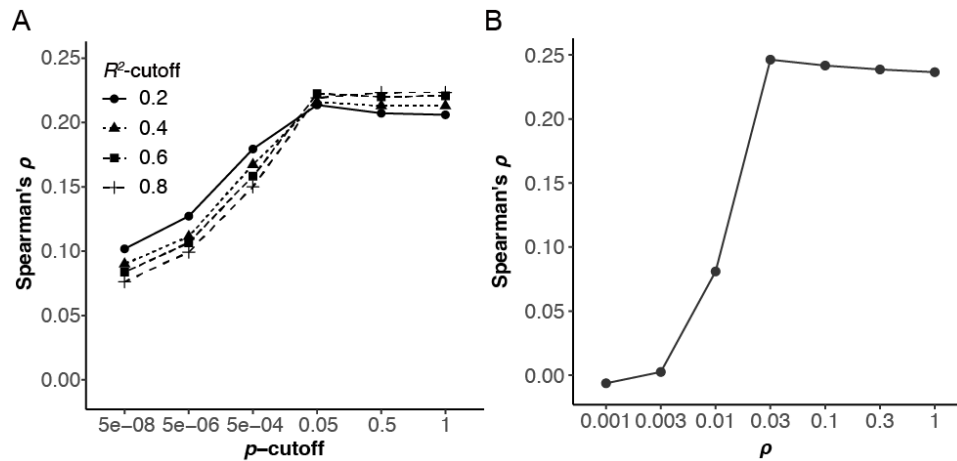


Figure S1. Correlation coefficient between continuous BMI and the PGS calculated by candidate

models. The analysis illustrated in Figure 2 was conducted with continuous BMI rather than

dichotomized obesity. The models were constructed using either the linkage disequilibrium pruning

and thresholding method (A) or LDpred (B), respectively. We evaluated the correlation using

Spearman's rank correlation coefficient (ρ). Prior to the correlation assessment, BMI values underwent

a natural logarithmic transformation and adjustment for variables including age, age², sex, and the first

10 principal components (PC1-10). Subsequently, the residuals were subjected to a rank-based

inverse-normal transformation (See ref. [20]). The best correlation was a Spearman's $\rho = 0.246$,

achieved with the model by LDpred at parameter (ρ) = 0.03. BMI, body mass index; PGS, polygenic

score

Figure S2

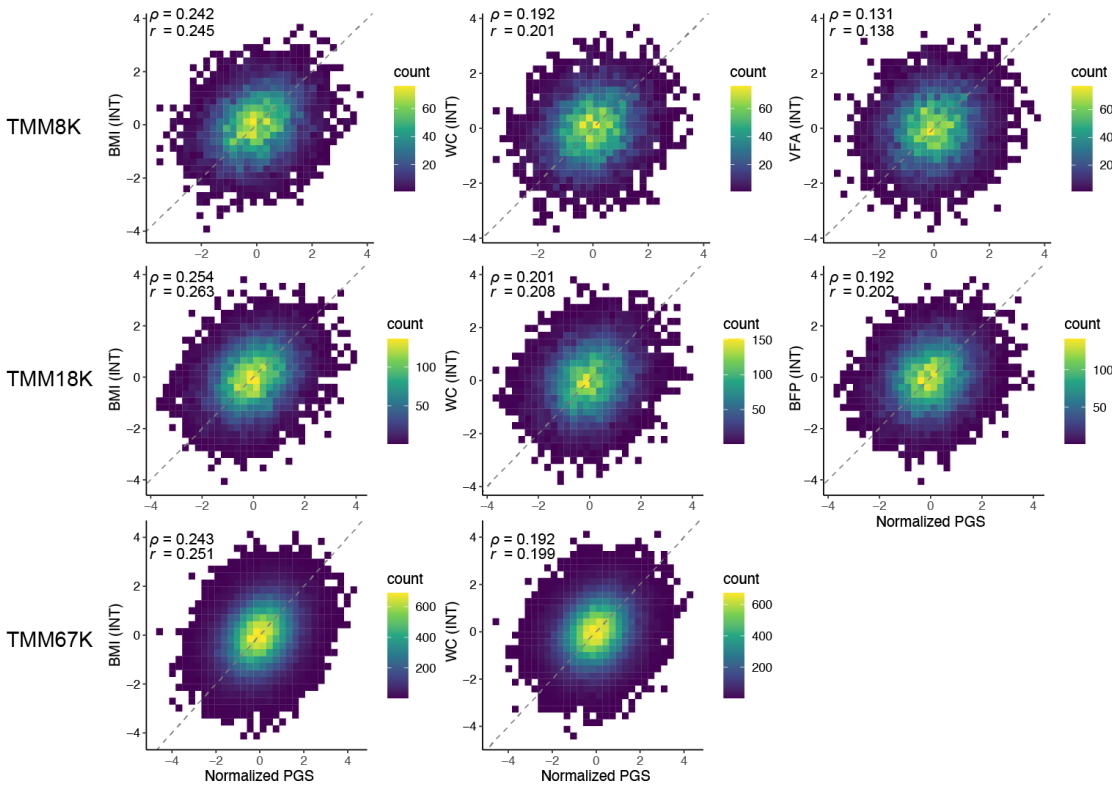
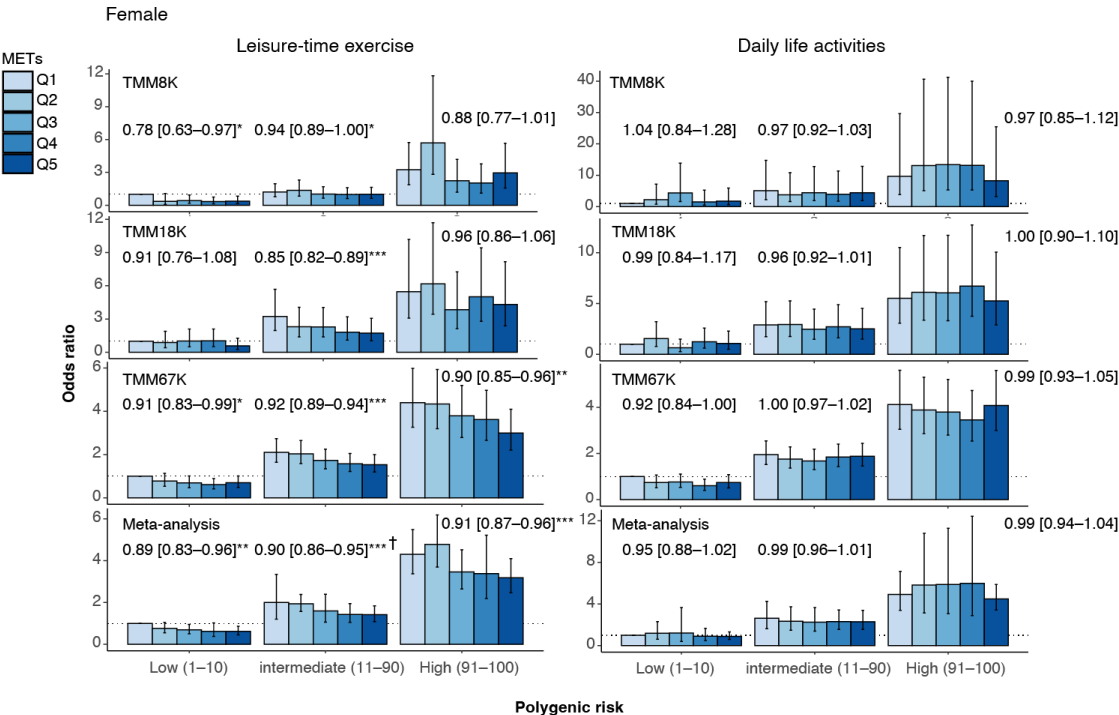


Figure S2. Correlation between PGS and various obesity-related measures. Before adjustment, BMI, visceral fat area (VFA), and body fat percentage (BFP) underwent a natural logarithmic transformation. The transformed values, along with the native values of waist circumference (WC), were adjusted for age, age², sex, and the initial 10 principal components (PC1-10). Subsequently, the residuals were processed using a rank-based inverse-normal transformation (INT). Correlation coefficients were calculated using both Spearman's rank correlation coefficient (ρ) and Pearson's correlation coefficient (r). All correlation coefficients presented here were statistically significant ($p < 0.05$). The dotted line represents the diagonal. BMI, body mass index; PGS, polygenic score

27 **Figure S3**



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30 **Figure S3. Effect of physical activity across different PGS stratifications (female only).** Odds

31 ratios were calculated using logistic regression with adjustments for age. Refer to the legend of Figure

32 4 for comprehensive information. PGS, polygenic score

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Figure S4

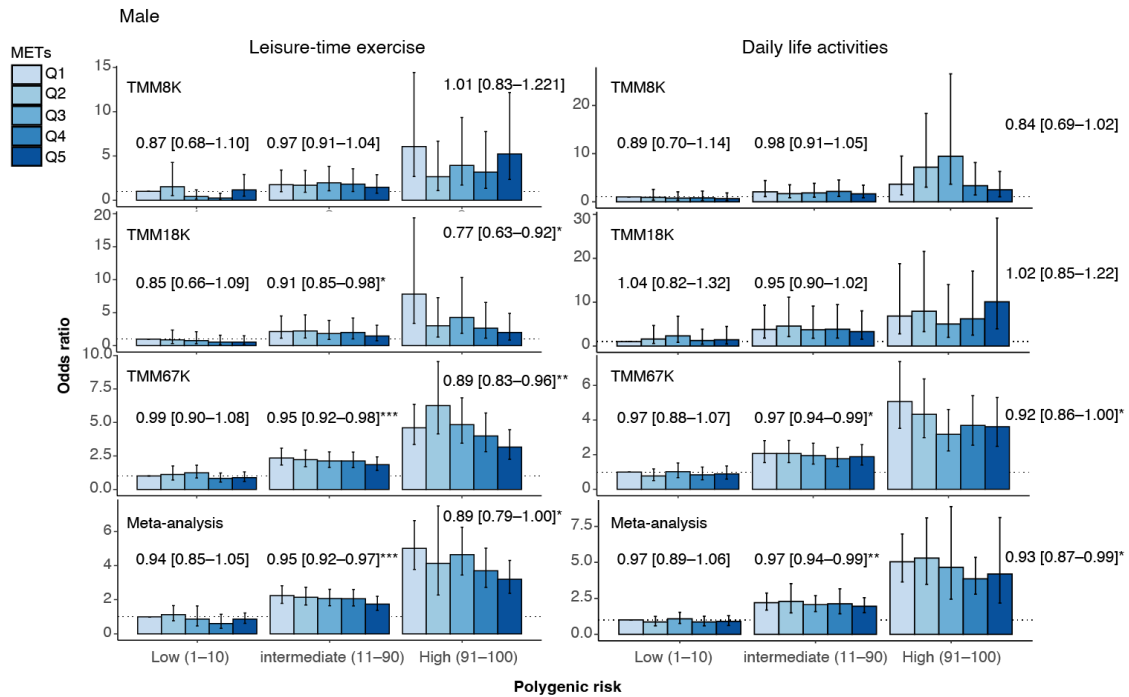
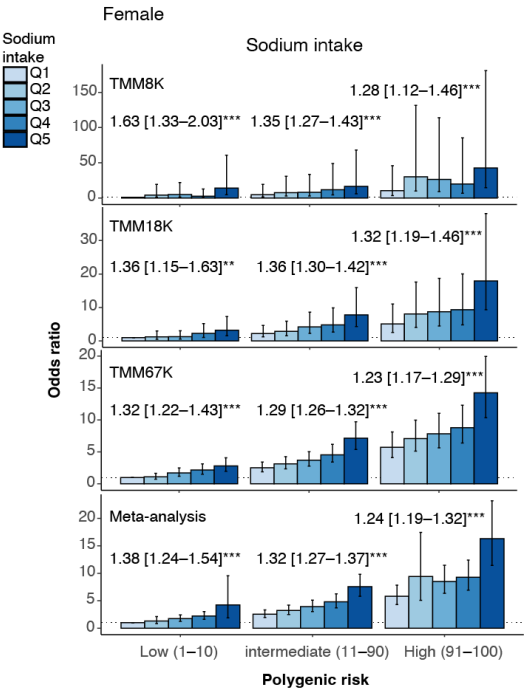


Figure S4. Effect of physical activity across different PGS stratifications (male only). Odds ratios

were calculated using logistic regression with adjustments for age. See the legend of Figure 4 for

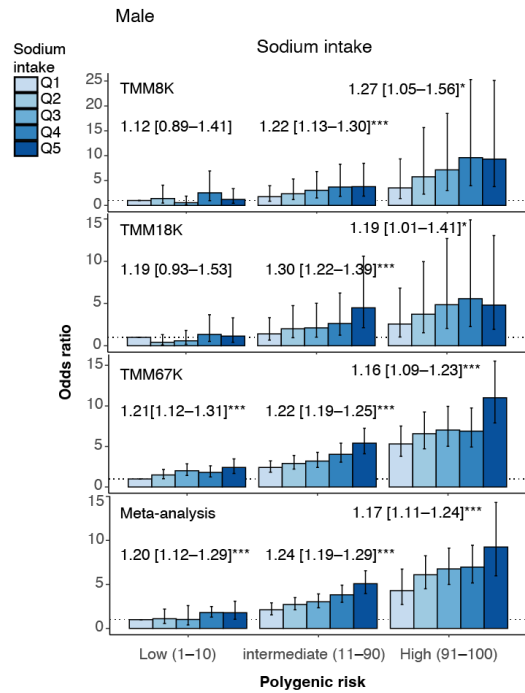
comprehensive information. PGS, polygenic score

41 **Figure S5**



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44 **Figure S5. Effect of sodium intake across different PGS stratifications (female only).** Odds ratios
45 were calculated by logistic regression with adjustments for age. See the legend of Figure 4 for
46 comprehensive information. PGS, polygenic score

47 **Figure S6**



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50 **Figure S6. Effect of sodium intake across different PGS stratifications (male only).** Odds ratios

51 were calculated using logistic regression with adjustments for age. See the legend of Figure 4 for

52 comprehensive information. PGS, polygenic score

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Figure S7

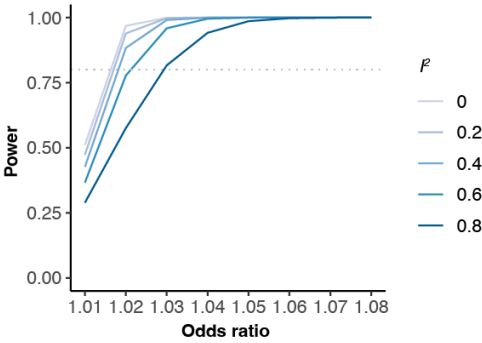


Figure S7. Power calculation for the current study design. The statistical power of the meta-analysis in the current study design (3 datasets, total $n = 68,938$) was estimated using the R package "metapower" (version 0.2.2) (<https://cran.r-project.org/web/packages/metapower/index.html>). The power was computed for a two-tailed test at a significance level of $p=0.05$ by employing a random-effects model with varying odds ratios and heterogeneity (I^2). The horizontal dashed line indicates a power of 0.8.