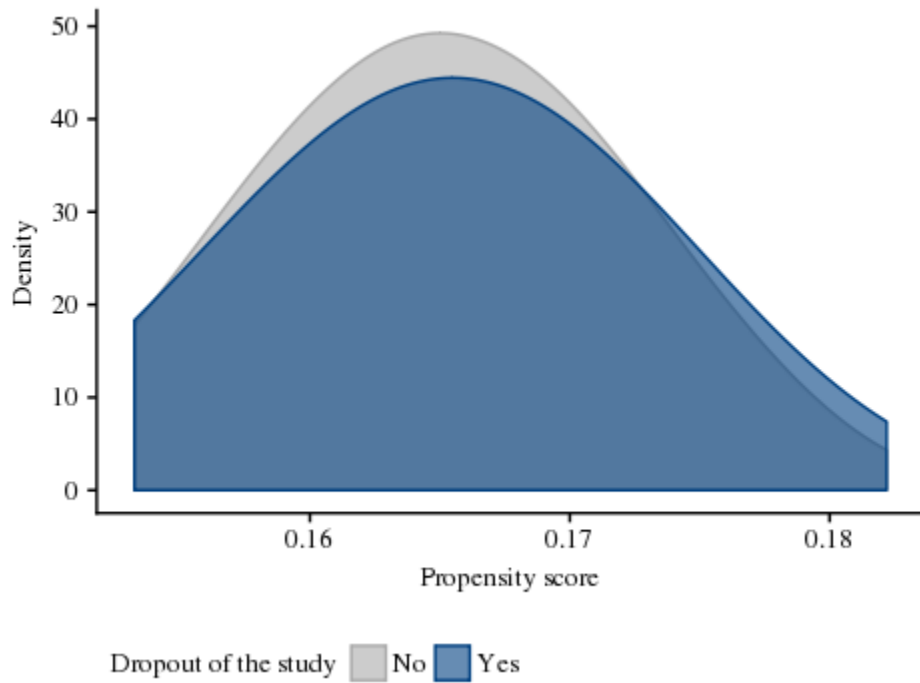
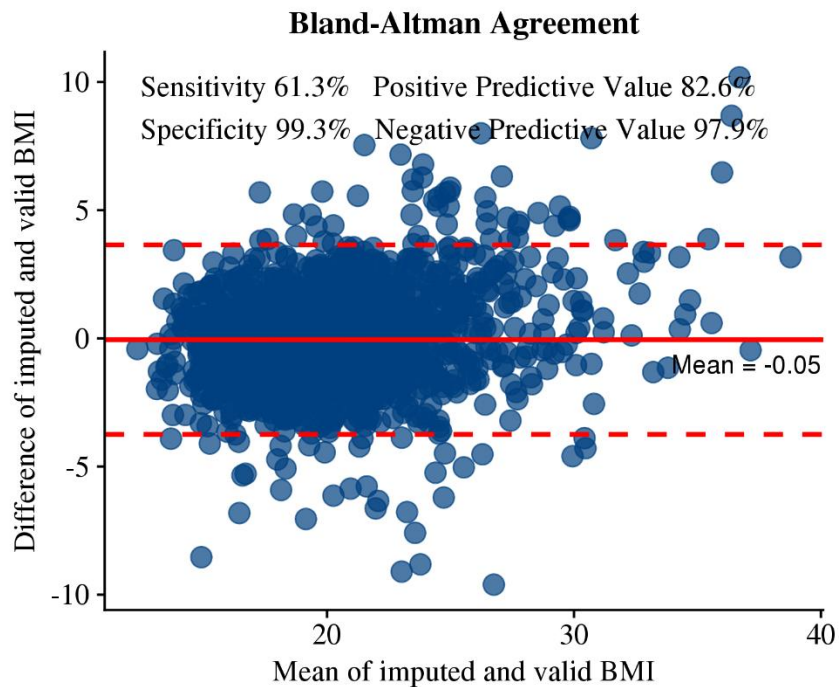


Supplementary Figure 1. Propensity score for offspring who dropped out and those who remained in the study.



Supplementary Figure 2. Bland-Altman plot between observed and imputed body mass index in offspring.

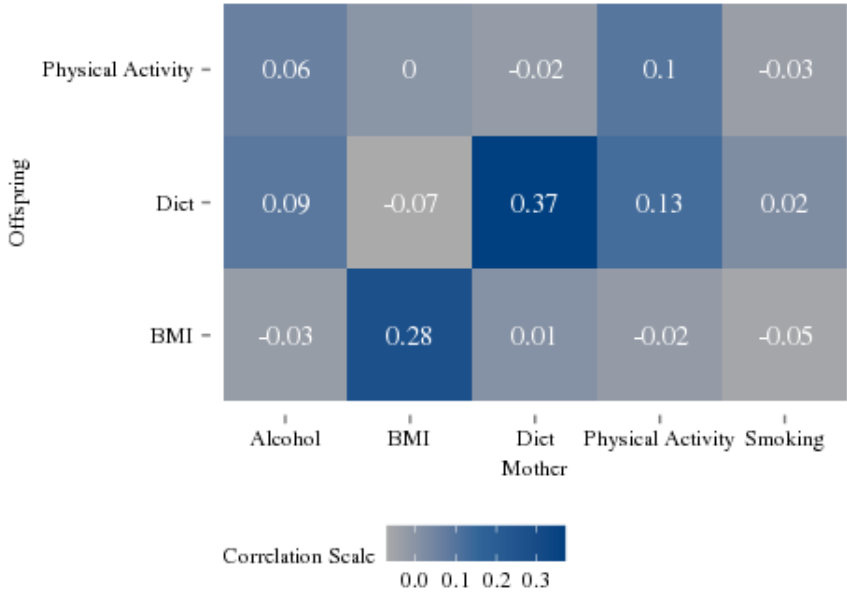


Abbreviation: BMI, body mass index.

Difference of the imputed and valid measures are plotted against the mean of imputed and valid body mass index.

Sensitivity, specificity, positive predicted value, and negative predicted value are calculated based on the classification of obesity status from imputed data with a reference the observed obesity status. For example, a specificity of 99.3% shows that among GUTS participants without obesity, 99.3% of them are correctly classified as non-obese by imputation.

Supplementary Figure 3. Correlation coefficients between maternal and offspring lifestyle



Abbreviation: BMI, body mass index.

Supplementary Table 1. Risk of obesity in offspring according to combination of maternal lifestyle low risk factors stratified by gender and age-group.

No. of low risk factors	No (%) of mothers	No (%) of offspring	No (%) of obese offspring	Relative risk (95% CI)
Boys				
0	52 (0.7)	64 (0.6)	6 (9.4)	1 (reference)
1	847 (11.1)	1213 (10.9)	135 (11.1)	1.10 (0.53 to 2.29)
2	2003 (26.4)	2935 (26.5)	258 (8.8)	0.84 (0.40 to 1.76)
3	2432 (31.9)	3529 (31.6)	195 (5.5)	0.56 (0.26 to 1.17)
4	1638 (21.5)	2425 (21.7)	105 (4.3)	0.46 (0.22 to 0.96)
5	651 (8.5)	967 (8.7)	34 (3.5)	0.38 (0.16 to 0.87)
Girls				
0	65 (0.7)	81 (0.6)	9 (11.1)	1 (reference)
1	1065 (11.6)	1489 (11.4)	111 (7.5)	0.62 (0.30 to 1.28)
2	2538 (27.2)	3520 (26.8)	188 (5.3)	0.47 (0.23 to 0.94)
3	2900 (31.1)	4112 (31.3)	153 (3.7)	0.32 (0.16 to 0.66)
4	2011 (21.5)	2890 (22.0)	71 (2.7)	0.22 (0.11 to 0.44)
5	743 (8.0)	1064 (7.8)	17 (1.6)	0.16 (0.06 to 0.39)
Age 9 to 11 years				
0	56 (0.6)	62 (0.6)	8 (12.9)	1 (reference)
1	917 (10.3)	1002 (10.3)	118 (11.8)	0.81 (0.43 to 1.56)
2	2283 (25.6)	2472 (25.3)	211 (8.5)	0.60 (0.32 to 1.13)
3	2867 (32.2)	3177 (32.5)	186 (5.9)	0.42 (0.22 to 0.80)
4	1995 (22.4)	2178 (22.3)	95 (4.4)	0.32 (0.16 to 0.62)
5	794 (8.9)	873 (8.9)	25 (2.9)	0.24 (0.11 to 0.49)
Age 12 to 14 years				
0	73 (0.6)	83 (0.6)	7 (8.4)	1 (reference)
1	1429 (11.8)	1700 (11.7)	128 (7.5)	0.87 (0.37 to 2.04)
2	3333 (27.5)	3983 (27.4)	235 (5.9)	0.67 (0.28 to 1.64)

3	3710 (30.6)	4464 (30.7)	162 (3.6)	0.42 (0.18 to 1.00)
4	2624 (21.7)	3137 (21.6)	81 (2.6)	0.32 (0.13 to 0.76)
5	938 (7.7)	1158 (8)	26 (2.2)	0.27 (0.10 to 0.71)

Adjusted for mother's age at baseline (in 5 year categories), race/ethnicity of mom (white, others), chronic diseases (prevalence of diabetes, cardiovascular disease or cancer), living status (with spouse/partner or not), household income (<\$50,000; \$50,000- \$99,999; ≥\$100,000) and educational attainment of spouse/partner (high school, college, graduate school); and offspring gender (boy, girl) for the age-group analysis.

Supplementary Table 2. Maternal low-risk lifestyle factors and risk of offspring obesity according to early life and concurrent risk factors of offspring obesity and concurrent maternal BMI levels.

	No (%) of mothers	No (%) of offspring	No (%) of obese offspring	Relative risk (95% CI)
Early life exposure factors of offspring obesity				
Pregnancy complications ^a				
No	10135 (70.3)	14904 (71.4)	693 (4.7)	0.21 (0.09 to 0.50)
Yes	4290 (29.7)	5971 (28.6)	383 (6.4)	0.42 (0.13 to 1.36)
Birthweight, kg				
3.20-3.89	6934 (50.1)	10055 (50.1)	480 (4.8)	0.19 (0.08 to 0.45)
≤3.19 or ≥3.90	6907 (49.9)	10031 (49.9)	550 (5.5)	0.33 (0.11 to 0.97)
Gestational age, week				
40-42	8938 (64.1)	12881 (63.7)	633 (4.9)	0.29 (0.13 to 0.66)
≤39 or ≥43	5007 (35.9)	7331 (36.3)	409 (5.6)	0.22 (0.06 to 0.78)
Gestational weight gain ^b				
No	6305 (68.2)	8296 (69.0)	418 (5.0)	0.16 (0.06 to 0.41)
Yes	2938 (31.8)	3735 (31.0)	338 (9.1)	0.27 (0.1 to 0.73)
Concurrent maternal body mass index before incidence of offspring obesity				
Concurrent body mass index, kg/m²				
18.5-24.9	9514 (57.2)	13731 (57.6)	444 (3.2)	0.48 (0.20 to 1.12)
25.0-29.9	4437 (26.3)	6371 (26.3)	402 (6.3)	0.66 (0.29 to 1.49)
≥30	2785 (16.5)	3880 (16.2)	434 (11.2)	0.61 (0.25 to 1.44)

Having all five factors in low-risk category (healthy diet, BMI 18.5 to 24.9, moderate/vigorous physical activity >150 min/week, not smoking and light-to-moderate alcohol intake 1-15g/day), except for analysis in women with concurrent BMI in which other four factors except BMI were included. The reference group for relative risk is women without any low-risk factor.

Adjusted for mother's age at baseline (in 5 year categories), race/ethnicity of (white, others), chronic diseases (prevalence of diabetes, cardiovascular disease or cancer), living status (with spouse/partner or not), household income (<\$50,000; \$50,000- \$99,999; ≥\$100,000) and educational attainment of spouse/partner (high school, college, graduate school); and offspring gender (boy, girl).

^a Pregnancy complications include gestational diabetes, preeclampsia, pregnancy-induced hypertension, and C-section delivery.

^bThe Institute of Medicine recommendations for gestational weight gain is 28–40 pounds for underweight women, 25–35 pounds for normal-weight women, 15–25 pounds for overweight women, and 11–20 pounds for obese women.

Supplementary Table 3. Risk of obesity in offspring according to combination of maternal lifestyle low risk factors in population without missing covariates.

No. of low risk factors	No (%) of mothers	No (%) of offspring	No (%) of obese offspring	Relative risk (95% CI)
0	67 (0.6)	85 (0.5)	8 (9.4)	1 (reference)
1	1318 (11.0)	1910 (11.0)	171 (9.0)	0.85 (0.40 to 1.78)
2	3135 (26.3)	4547 (26.1)	303 (6.7)	0.65 (0.31 to 1.34)
3	3803 (31.9)	5552 (31.9)	243 (4.4)	0.42 (0.20 to 0.90)
4	2635 (22.1)	3891 (22.3)	121 (3.1)	0.32 (0.15 to 0.68)
5	983 (8.2)	1441 (8.3)	36 (2.5)	0.27 (0.12 to 0.62)

Adjusted for mother's age at baseline (in 5 year categories), race/ethnicity (white, others), chronic diseases (prevalence of diabetes, cardiovascular disease or cancer), living status (with spouse/partner or not), household income (<\$50,000; \$50,000- \$99,999; ≥\$100,000) and educational attainment of spouse/partner (high school, college, graduate school); and offspring gender (boy, girl)

Supplementary Table 4. Risk of obesity in offspring according to combination of maternal lifestyle low risk factors in population with valid assessments of offspring body mass index.

No. of low-risk factors	No. (%) of mothers	No. (%) of offspring	No. (%) of obese offspring	RR (95%CI) Model 1
0	117 (0.7)	145 (0.6)	15 (10.3)	1.00 (reference)
1	1915 (11.3)	2704 (11.1)	203 (7.5)	0.79 (0.48 to 1.30)
2	4534 (26.8)	6449 (26.6)	349 (5.4)	0.58 (0.35 to 0.95)
3	5337 (31.5)	7647 (31.5)	263 (3.4)	0.38 (0.23 to 0.62)
4	3649 (21.5)	5311 (21.9)	131 (2.5)	0.28 (0.17 to 0.47)
5	1393 (8.2)	2033 (8.4)	37 (1.8)	0.21 (0.12 to 0.37)

Adjusted for mother's age at baseline (in 5 year categories), race/ethnicity (white, others), chronic diseases (prevalence of diabetes, cardiovascular disease or cancer), living status (with spouse/partner or not), household income (<\$50,000; \$50,000- \$99,999; ≥\$100,000) and educational attainment of spouse/partner (high school, college, graduate school); and offspring gender (boy, girl)

Supplementary Table 5. Risk of obesity in offspring according to combination of maternal lifestyle low-risk^a factors.

No. of low-risk factors	No. (%) of mothers	No. (%) of offspring	No. (%) of obese offspring	Relative risk (95% confidence interval)
0	414 (2.4)	553 (2.3)	61 (11)	1.00 (reference)
1	2575 (15.2)	3654 (15)	316 (8.6)	0.85 (0.63 to 1.16)
2	4986 (29.4)	7036 (29)	429 (6.1)	0.59 (0.43 to 0.79)
3	4994 (29.5)	7253 (29.9)	303 (4.2)	0.42 (0.32 to 0.56)
4	3050 (18)	4416 (18.2)	139 (3.1)	0.33 (0.24 to 0.47)
5	926 (5.5)	1377 (5.7)	34 (2.5)	0.25 (0.16 to 0.40)

^aFormer smoker is removed from low-risk group.

Adjusted for mother's age at baseline (in 5-year categories), race/ethnicity (white, others), chronic diseases (prevalence of diabetes, cardiovascular disease or cancer), living status (with spouse/partner or not), household income (<\$50,000; \$50,000- \$99,999; ≥\$100,000) and educational attainment of spouse/partner (high school, college, graduate school); and offspring gender (boy, girl).

Supplementary Table 6. Risk of obesity in offspring according to combination of maternal lifestyle low risk factors with further adjustment of maternal lifestyle before pregnancy.

No. of low risk factors	No (%) of mothers	No (%) of offspring	No (%) of obese offspring	Relative risk (95% CI)
0-1	416 (10.2)	497 (10.2)	33 (6.6)	1 (reference)
2	1010 (24.8)	1224 (25.0)	75 (6.1)	0.95 (0.60 to 1.51)
3	1307 (32.1)	1594 (32.6)	54 (3.4)	0.53 (0.33 to 0.84)
4	968 (24.8)	1150 (23.5)	33 (2.9)	0.49 (0.28 to 0.85)
5	369 (9.1)	426 (8.7)	3 (0.7)	0.20 (0.03 to 1.19)

This analysis includes only women with information on lifestyle before pregnancy.

Adjusted for mother's age at baseline (in 5 year categories), maternal lifestyle before pregnancy, race/ethnicity (white, others), chronic diseases (prevalence of diabetes, cardiovascular disease or cancer), living status (with spouse/partner or not), household income (<\$50,000; \$50,000- \$99,999; ≥\$100,000) and educational attainment of spouse/partner (high school, college, graduate school); and offspring gender (boy, girl).