Online Appendix Table 1. Body mass index reference for screening overweight and obesity in Chinese children and adolescents [1] (kg/m^2)

Age (year)	Boys		Girls	
	Overweight	Obese	Overweight	Obese
6	16.8	18.4	16.7	18.4
7	17.4	19.2	17.2	18.9
8	18.1	20.3	18.1	19.9
9	18.9	21.4	19.0	21.0
10	19.6	22.5	20.0	22.1
11	20.3	23.6	21.1	23.3
12	21.0	24.7	21.9	24.5
13	21.9	25.7	22.6	25.6
14	22.6	26.4	23.0	26.3
15	23.1	26.9	23.4	26.9
16	23.5	27.4	23.7	27.4
17	23.8	27.8	23.8	27.7
18	24.0	28.0	24.0	28.0

1. Ji CY; Working Group on Obesity in China. Report on childhood obesity in China (1)--body mass index reference for screening overweight and obesity in Chinese school-age children. *Biomed Environ Sci*.18:390-400, 2005

Online Appendix Table 2. Basic characteristics of participants in this study

	All	Obese	Overweight	Normal weight	*P* Value
n	3503	1229	655	1619	
Boys (%)	50.8	64.0	50.1	41.2	<0.001
Age (years)	12.4±3.1	11.8±2.9	13.3±3	12.5±3.2	<0.001
BMI (kg/m^2)	21.9±4.9	26.5±3.7	23.4±2.5	17.8±2.4	<0.001
Waist circumference (cm)	72.4±13.1	83.7±10.9	76.1±7.9	62.3±7.2	<0.001
Waist-to-height ratio	0.47±0.07	0.55±0.05	0.49±0.03	0.42±0.03	<0.001
Fat mass percentage	24.4±8.5	30.9±6.7	27.8±6.2	18.1±5.6	<0.001
Birth weight (g)	3355±525	3423±516	3348±554	3304±513	<0.001

Categorical data were expressed as percentage and differences between groups were assessed by the Chi-square test; continuous variables were expressed as mean ± SD and were assessed by ANOVA test. Obese, overweight, and normal weight children were diagnosed by the Chinese age- and sex-specific BMI cutoffs (online appendix Table 1) (Reference: Ji CY; Working Group on Obesity in China: Report on childhood obesity in China (1)--body mass index reference for screening overweight and obesity in Chinese school-age children. *Biomed Environ Sci* 18:390-400, 2005).

Online Appendix Table 3. The genotyping results of six SNPs (rs7138803, rs1805081, rs6499640, rs17782313, rs6265, and rs10938397)

SNP	Chr.	Nearest gene	Effect allele (1)	Other allele (2)	EAF* (Obese)	EAF* (Overweight)	EAF* (Normal weight)	EAF* in HapMap-CEU	Genotype count					
									Obese (11/12/22)	$P_{H\text{-}W}$†	Overweight (11/12/22)	$P_{H\text{-}W}$†	Normal weight (11/12/22)	$P_{H\text{-}W}$†
rs7138803	12	*FAIM2*	A	G	0.304	0.302	0.280	0.442	111/513/585	0.923	67/258/323	0.151	127/635/828	0.733
rs1805081	18	*NPC1*	A	G	0.784	0.755	0.765	0.533	745/395/63	0.263	371/234/41	0.616	938/552/96	0.221
rs6499640	16	*FTO*	A	G	0.182	0.162	0.158	0.650	45/350/813	0.340	20/169/458	0.365	45/413/1130	0.331
rs17782313	18	*MC4R*	C	T	0.259	0.246	0.207	0.283	87/452/668	0.382	38/243/367	0.789	61/535/993	0.290
rs6265	11	*BDNF*	G	A	0.555	0.534	0.519	0.825	369/604/237	0.718	185/322/141	0.968	417/818/355	0.224
rs10938397	4	*GNPDA2*	G	A	0.351	0.330	0.304	0.446	154/541/514	0.532	75/277/295	0.419	147/670/768	0.960

Obese, overweight, and normal weight children were diagnosed by the Chinese age- and sex-specific BMI cutoffs (online appendix Table 1) (Reference: Ji CY; Working Group on Obesity in China: Report on childhood obesity in China (1)--body mass index reference for screening overweight and obesity in Chinese school-age children. *Biomed Environ Sci* 18:390-400, 2005).*EAF indicates effect allele frequency. †$P_{H\text{-}W}$ indicates *P* value for Hardy–Weinberg equilibrium.

Online Appendix Table 4. Associations of six SNPs (rs7138803, rs1805081, rs6499640, rs17782313, rs6265, and rs10938397) with BMI under different genetic models after age and sex adjustment

SNP	Position	Nearest gene	Effect allele	Other allele	*P* Value (Dominant model)		*P* Value (Additive model)		*P* Value (Recessive model)	
					Nominal *P* Value	Permuted *P* Value	Nominal *P* Value	Permuted *P* Value	Nominal *P* Value	Permuted *P* Value
rs7138803	48533735	*FAIM2*	A	G	0.0036	0.021	0.0016	0.0097	0.023	0.12
rs1805081	19394430	*NPC1*	A	G	0.12	0.41	0.063	0.28	0.065	0.28
rs6499640	52327178	*FTO*	A	G	0.016	0.086	0.023	0.12	0.33	0.50
rs17782313	56002077	*MC4R*	C	T	8.7×10^{-6}	5.5×10^{-5}	3.6×10^{-7}	1.0×10^{-5}	9.2×10^{-5}	0.00061
rs6265	27636492	*BDNF*	G	A	0.014	0.076	0.0067	0.038	0.035	0.18
rs10938397	45023455	*GNPDA2*	G	A	0.0020	0.012	0.00016	0.00093	0.00099	0.0058

Nominal *P* Values were adjusted for age and sex, and permuted *P* Values were further corrected for multiple testing. All *P* values were one-sided.

Online Appendix Table 5*A*. Associations of six SNPs (rs7138803, rs1805081, rs6499640, rs17782313, rs6265, and rs10938397) with waist circumference after age and sex adjustment

SNP	Position	Nearest gene	Effect allele (1)	Other allele (2)	Waist circumference, cm (mean±SE)			Per effect allele change in waist circumference (β)	Lower bound of one-sided 95% CI
					11	12	22		
rs7138803	48533735	*FAIM2*	A	G	73.5±0.6	72.8±0.3	71.8±0.3	0.87	0.38
rs1805081	19394430	*NPC1*	A	G	72.5±0.2	72.3±0.3	71.0±0.8	0.45	-0.077
rs6499640	52327178	*FTO*	A	G	72.9±1.1	72.8±0.4	72.2±0.2	0.56	-0.028
rs17782313	56002077	*MC4R*	C	T	75.2±0.8	73.1±0.3	71.6±0.2	1.60	1.07
rs6265	27636492	*BDNF*	G	A	72.9±0.4	72.2±0.3	71.9±0.4	0.50	0.052
rs10938397	45023455	*GNPDA2*	G	A	73.9±0.6	72.7±0.3	71.7±0.3	1.06	0.59

SNP	*P* Value (Dominant model)		*P* Value (Additive model)		*P* Value (Recessive model)	
	Nominal *P* Value	Permuted *P* Value	Nominal *P* Value	Permuted *P* Value	Nominal *P* Value	Permuted *P* Value
rs7138803	0.0038	0.022	0.0021	0.012	0.032	0.16
rs1805081	0.17	0.46	0.082	0.33	0.059	0.26
rs6499640	0.035	0.18	0.048	0.23	0.37	0.50
rs17782313	3.6×10^{-6}	1.0×10^{-5}	2.3×10^{-7}	1.0×10^{-5}	0.00019	0.0010
rs6265	0.047	0.22	0.039	0.19	0.12	0.40
rs10938397	0.0020	0.012	0.00030	0.0018	0.0030	0.018

Nominal *P* Values were adjusted for age and sex, and permuted *P* Values were further corrected for multiple testing. All *P* values and 95% CIs were one-sided. ANCOVA was applied for comparison of waist circumference between genotypes of SNPs, and linear regression was used to estimate the effect of per allele on waist circumference.

Online Appendix Table 5*B*. Associations of six SNPs (rs7138803, rs1805081, rs6499640, rs17782313, rs6265, and rs10938397) with waist-to-height ratio after age and sex adjustment

SNP	Position	Nearest gene	Effect allele (1)	Other allele (2)	Waist-to-height ratio (mean±SE)			Per effect allele change in waist-to-height ratio (β)	Lower bound of one-sided 95% CI
					11	12	22		
rs7138803	48533735	*FAIM2*	A	G	0.481±0.004	0.477±0.002	0.471±0.002	0.0050	0.0024
rs1805081	19394430	*NPC1*	A	G	0.476±0.001	0.475±0.002	0.467±0.005	0.0030	-0.00045
rs6499640	52327178	*FTO*	A	G	0.474±0.006	0.479±0.002	0.473±0.001	0.0030	-7.7×10^{-6}
rs17782313	56002077	*MC4R*	C	T	0.491±0.005	0.479±0.002	0.471±0.001	0.0090	0.0060
rs6265	27636492	*BDNF*	G	A	0.478±0.002	0.474±0.002	0.472±0.002	0.0030	0.00013
rs10938397	45023455	*GNPDA2*	G	A	0.485±0.003	0.477±0.002	0.471±0.002	0.0070	0.0040

SNP	*P* Value (Dominant model)		*P* Value (Additive model)		*P* Value (Recessive model)	
	Nominal *P* Value	Permuted *P* Value	Nominal *P* Value	Permuted *P* Value	Nominal *P* Value	Permuted *P* Value
rs7138803	0.0023	0.014	0.0014	0.0078	0.033	0.17
rs1805081	0.18	0.47	0.092	0.35	0.066	0.28
rs6499640	0.016	0.087	0.038	0.19	0.42	0.50
rs17782313	1.1×10^{-5}	6.0×10^{-5}	1.0×10^{-6}	5.0×10^{-6}	0.00045	0.0026
rs6265	0.045	0.22	0.035	0.18	0.11	0.38
rs10938397	0.00083	0.0050	0.00012	0.00063	0.0022	0.013

Nominal *P* Values were adjusted for age and sex, and permuted *P* Values were further corrected for multiple testing. All *P* values and 95% CIs were one-sided. ANCOVA was applied for comparison of waist-to-height ratio between genotypes of SNPs, and linear regression was used to estimate the effect of per allele on waist-to-height ratio.

Online Appendix Table 5*C*. Associations of six SNPs (rs7138803, rs1805081, rs6499640, rs17782313, rs6265, and rs10938397) with fat mass percentage after age and sex adjustment

SNP	Position	Nearest gene	Effect allele (1)	Other allele (2)	Fat mass percentage, % (mean±SE)			Per effect allele change in fat mass percentage (β)	Lower bound of one-sided 95% CI
					11	12	22		
rs7138803	48533735	*FAIM2*	A	G	25.4±0.5	24.5±0.2	24.1±0.2	0.57	0.22
rs1805081	19394430	*NPC1*	A	G	24.4±0.2	24.5±0.2	23.3±0.6	0.26	-0.12
rs6499640	52327178	*FTO*	A	G	24.5±0.8	24.8±0.3	24.2±0.2	0.41	-0.019
rs17782313	56002077	*MC4R*	C	T	26.0±0.6	24.9±0.2	23.9±0.2	0.99	0.61
rs6265	27636492	*BDNF*	G	A	24.6±0.3	24.5±0.2	23.8±0.3	0.38	0.050
rs10938397	45023455	*GNPDA2*	G	A	25.4±0.4	24.6±0.2	23.9±0.2	0.74	0.39

SNP	*P* Value (Dominant model)		*P* Value (Additive model)		*P* Value (Recessive model)	
	Nominal *P* Value	Permuted *P* Value	Nominal *P* Value	Permuted *P* Value	Nominal *P* Value	Permuted *P* Value
rs7138803	0.048	0.23	0.024	0.13	0.057	0.26
rs1805081	0.17	0.46	0.078	0.32	0.053	0.24
rs6499640	0.13	0.42	0.13	0.41	0.31	0.50
rs17782313	0.0035	0.020	0.00099	0.0059	0.011	0.062
rs6265	0.24	0.49	0.044	0.21	0.016	0.088
rs10938397	0.0053	0.031	0.00082	0.0047	0.0039	0.023

Nominal *P* Values were adjusted for age and sex, and permuted *P* Values were further corrected for multiple testing. All *P* values and 95% CIs were one-sided. ANCOVA was applied for comparison of fat mass percentage between genotypes of SNPs, and linear regression was used to estimate the effect of per allele on fat mass percentage.

Online Appendix Table 5*D*. Associations of six SNPs (rs7138803, rs1805081, rs6499640, rs17782313, rs6265, and rs10938397) with birth weight after sex adjustment

SNP	Position	Nearest gene	Effect allele (1)	Other allele (2)	Birth weight, g (mean±SE)			Per effect allele change in birth weight (β)	Lower bound of one-sided 95% CI
					11	12	22		
rs7138803	48533735	*FAIM2*	A	G	3416±32	3352±15	3345±13	24.10	0.13
rs1805081	19394430	*NPC1*	A	G	3360±12	3341±16	3371±40	7.60	-19.88
rs6499640	52327178	*FTO*	A	G	3367±55	3360±18	3351±11	8.20	-21.43
rs17782313	56002077	*MC4R*	C	T	3323±39	3345±16	3363±12	(-19.30)	-45.15
rs6265	27636492	*BDNF*	G	A	3357±18	3367±13	3323±20	14.80	-6.39
rs10938397	45023455	*GNPDA2*	G	A	3359±28	3341±14	3367±14	(-11.90)	-33.51

SNP	*P* Value (Dominant model)		*P* Value (Additive model)		*P* Value (Recessive model)	
	Nominal *P* Value	Permuted *P* Value	Nominal *P* Value	Permuted *P* Value	Nominal *P* Value	Permuted *P* Value
rs7138803	0.014	0.076	0.014	0.075	0.12	0.41
rs1805081	0.25	0.49	0.18	0.46	0.16	0.45
rs6499640	0.23	0.49	0.13	0.41	0.059	0.26
rs17782313	0.13	0.42	0.053	0.24	0.032	0.16
rs6265	0.060	0.27	0.068	0.29	0.20	0.48
rs10938397	0.18	0.47	0.17	0.46	0.28	0.50

Nominal *P* Values were adjusted for age and sex, and permuted *P* Values were further corrected for multiple testing. All *P* values and 95% CIs were one-sided. ANCOVA was applied for comparison of birth weight between genotypes of SNPs, and linear regression was used to estimate the effect of per allele on birth weight.

Online Appendix Table 6. Associations of six SNPs (rs7138803, rs1805081, rs6499640, rs17782313, rs6265, and rs10938397) with overweight and obesity in multinomial logistic regression with age and sex as covariates under different genetic models

					Overweight (n=655) vs. normal weight (n=1619)											
SNP	Chr.	Nearest gene	Effect allele	Other allele	OR (Dominant model)	Lower bound of one-sided 95% CI	Nominal *P* Value	Permuted *P* Value	OR (Additive model)	Lower bound of one-sided 95% CI	Nominal *P* Value	Permuted *P* Value	OR (Recessive model)	Lower bound of one-sided 95% CI	Nominal *P* Value	Permuted *P* Value
rs7138803	12	*FAIM2*	A	G	1.09	0.93	0.15	0.44	1.12	0.99	0.056	0.26	1.33	1.02	0.034	0.18
rs1805081	18	*NPC1*	A	G	0.97	0.70	0.18	0.47	0.95	0.83	0.20	0.48	0.93	0.79	0.41	0.50
rs6499640	16	*FTO*	A	G	1.02	0.86	0.45	0.50	1.03	0.89	0.38	0.50	1.12	0.72	0.28	0.50
rs17782313	18	*MC4R*	C	T	1.28	1.09	0.0068	0.039	1.26	1.10	0.0021	0.013	1.57	1.11	0.015	0.078
rs6265	11	*BDNF*	G	A	1.01	0.84	0.12	0.40	1.05	0.94	0.21	0.48	1.11	0.94	0.45	0.50
rs10938397	4	*GNPDA2*	G	A	1.12	0.96	0.10	0.38	1.12	1.00	0.057	0.26	1.26	0.98	0.084	0.33

	Obese (n=1229) vs. normal weight (n=1619)														
SNP	OR (Dominant model)	Lower bound of one-sided 95% CI	Nominal *P* Value	Permuted *P* Value	Power	OR (Additive model)	Lower bound of one-sided 95% CI	Nominal *P* Value	Permuted *P* Value	Power	OR (Recessive model)	Lower bound of one-sided 95% CI	Nominal *P* Value	Permuted *P* Value	Power
rs7138803	1.17	1.03	0.027	0.14	0.41	1.15	1.04	0.020	0.11	0.636	1.23	0.98	0.098	0.36	0.190
rs1805081	1.19	0.90	0.052	0.24	0.42	1.12	1.01	0.048	0.23	0.994	1.14	1.00	0.19	0.47	0.960
rs6499640	1.22	1.06	0.013	0.071	0.42	1.19	1.05	0.016	0.088	0.512	1.21	0.84	0.25	0.49	0.089
rs17782313	1.38	1.21	3.0×10^{-5}	0.00018	0.66	1.37	1.23	8.2×10^{-7}	5.0×10^{-6}	0.766	1.97	1.47	4.4×10^{-5}	0.00026	0.122
rs6265	1.19	1.02	0.0075	0.043	0.31	1.16	1.06	0.0075	0.043	0.538	1.26	1.09	0.069	0.30	0.181
rs10938397	1.30	1.14	0.00043	0.0026	0.67	1.24	1.13	0.00014	0.00085	0.852	1.37	1.12	0.0073	0.041	0.226

Nominal *P* Values were adjusted for age and sex, and permuted *P* Values were further corrected for multiple testing. All *P* values and 95% CIs were one-sided. Obese, overweight, and normal weight children were diagnosed by the Chinese age- and sex-specific BMI cutoffs (online appendix Table 1) (Reference: Ji CY; Working Group on Obesity in China: Report on childhood obesity in China (1)--body mass index reference for screening overweight and obesity in Chinese school-age children. *Biomed Environ Sci* 18:390-400, 2005). ORs and 95% CIs were calculated using multinomial logistic regression with genotypes, age and sex as the independent variables.

Online Appendix Table 7. Associations of the number of effect alleles with overweight and obesity after age and sex adjustment

No.of effect alleles	Obese	Overweight	Normal weight	Overweight			Obese		
				OR	Lower bound of one-sided 95% CI	*P* Value	OR	Lower bound of one-sided 95% CI	*P* Value
≤3	219	141	414	1			1		
4-6	806	428	1025	1.22	1.01	0.043	1.54	1.31	5.9×10^{-6}
≥7	172	75	141	1.56	1.17	0.0054	2.50	1.97	1.3×10^{-10}

All *P* values and 95% CIs were one-sided. Obese, overweight, and normal weight children were diagnosed by the Chinese age- and sex-specific BMI cutoffs (online appendix Table 1) (Reference: Ji CY; Working Group on Obesity in China: Report on childhood obesity in China (1)--body mass index reference for screening overweight and obesity in Chinese school-age children. *Biomed Environ Sci* 18:390-400, 2005).

Online Appendix Table 8. Associations between the number of effect alleles and anthropometric indices (mean±SE)

No.of effect alleles	BMI, kg/m^2	Waist circumference, cm	Waist-to-height ratio	Fat mass percentage, %	Birth weight, g
Model 1*					
≤3	21.1±0.2	70.4±0.5	0.465±0.002	23.3±0.3	3345±20
4-6	22.0±0.1	72.6±0.3	0.476±0.001	24.5±0.2	3363±12
≥7	22.9±0.2	74.6±0.7	0.488±0.004	26.1±0.4	3327±28
P Value	4.87×10^{-9}	1.98×10^{-7}	1.33×10^{-7}	8.00×10^{-7}	0.211
Model 2†					
≤3	21.2±0.2	70.6±0.4	0.465±0.002	23.4±0.3	3343±20
4-6	22.0±0.1	72.6±0.2	0.476±0.001	24.4±0.2	3363±12
≥7	22.9±0.2	74.6±0.6	0.489±0.003	26.0±0.4	3329±28
P Value	1.02×10^{-9}	9.30×10^{-9}	9.45×10^{-9}	1.91×10^{-6}	0.217

All *P* values were one-sided.*Unadjusted. †Adjusted for age and sex.