

**Table S1** MR estimates of the effect of obesity indicators on benign tumor

No.	Exposure	Outcome	Method	nSNP	Beta	SE	P value	OR	OR lo_ci	OR up_ci
1	Birth weight	pRCC	MR Egger	150	-0.418611068	0.402161277	0.299617774	0.657960047	0.299138928	1.447191866
2			Weighted median		-0.208451571	0.218655157	0.340420463	0.811840351	0.528868385	1.246216967
3			Inverse variance weighted		-0.103002129	0.146829941	0.482987102	0.902125053	0.676523014	1.20295924
4			Simple mode		-0.452576267	0.581486909	0.437621301	0.635987565	0.203459033	1.988017823
5			Weighted mode		-0.542398006	0.422452716	0.201160811	0.581352493	0.254003983	1.330572523
1	Childhood obesity		MR Egger	10	-0.055682465	0.308490645	0.861248973	0.945839425	0.516683835	1.731449984
2			Weighted median		-0.106945922	0.101101185	0.29014172	0.898574264	0.737046538	1.095501665
3			Inverse variance weighted		-0.052319714	0.075407527	0.487791241	0.949025401	0.818633766	1.100185761
4			Simple mode		-0.183513233	0.17826891	0.330153117	0.832340861	0.586888577	1.180447767
5			Weighted mode		-0.159283025	0.161611075	0.350085362	0.852754974	0.621238178	1.17055112
1	Childhood BMI		MR Egger	11	0.169965088	0.674890497	0.806820579	1.185263471	0.315745021	4.449316381
2			Weighted median		-0.087100207	0.250300423	0.727853205	0.916585243	0.561193767	1.497038199
3			Inverse variance weighted		-0.052237923	0.191648307	0.785182395	0.949103026	0.651897065	1.381807961
4			Simple mode		-0.071883122	0.370446866	0.850026254	0.93063966	0.45024699	1.923589044
5			Weighted mode		-0.138739697	0.345471379	0.696430072	0.870454581	0.442257229	1.713236387
1	Adolescent BMI		MR Egger	6	-0.215905449	0.861929442	0.814547888	0.805811489	0.148779914	4.364380512
2			Weighted median		-0.274552936	0.269354099	0.30806003	0.759911776	0.448212885	1.28837418
3			Inverse variance weighted		-0.147557307	0.217834503	0.498163222	0.862812992	0.56297901	1.322333951
4			Simple mode		-0.347152125	0.407843047	0.433526169	0.706697813	0.317739156	1.571798093
5			Weighted mode		-0.361743928	0.397823268	0.404886581	0.696460689	0.319346827	1.518904995
1	Adult BMI		MR Egger	53	0.35345648	0.966727438	0.716159565	1.423981013	0.214096314	9.47107349
2			Weighted median		-0.013891421	0.314320626	0.964748913	0.986204619	0.532613186	1.826089883
3			Inverse variance weighted		0.239321775	0.234698434	0.307871203	1.270387249	0.801967532	2.012405365
4			Simple mode		-0.20787331	0.709859002	0.770811788	0.812309942	0.202058715	3.265622275
5			Weighted mode		-0.182134102	0.647439458	0.779585617	0.833489561	0.234308785	2.964911657

BMI, body mass index; EAF, effect allele frequency; SE, standard error; OR, odds ratio; CI, confidence interval.

**Table S2** The reverse MR estimates of kidney cancer and ccRCC on body size traits

No.	Exposure	Outcome	Method	nSNP	Beta	Beta lo_ci	Beta up_ci	SE	P value	OR	OR lo_ci	OR up_ci
1	Kidney cancer	Birth weight	Inverse variance	45	0.013928914	-0.000406461	0.028264289	0.007313967	0.056854628	1.014026373	0.999593622	1.028667514
2		Childhood obesity	weighted	46	0.022661797	-0.056787973	0.102111567	0.040535597	0.576121341	1.022920526	0.94479437	1.107507027
3		Childhood BMI		40	0.017355608	-0.019561519	0.054272734	0.018835269	0.35681971	1.017507091	0.980628566	1.055772508
4		Adult BMI		11	0.013856772	-0.018766174	0.046479718	0.01664436	0.405115176	1.013953222	0.981408814	1.047576832
1	ccRCC	Birth weight		39	0.007391158	-0.004012077	0.018794394	0.005817977	0.203942174	1.00741854	0.995995961	1.01897212
2		Childhood obesity		39	0.028988739	-0.030040268	0.088017746	0.03011684	0.335777164	1.029413002	0.970406456	1.092007501
3		Childhood BMI		36	-0.001543167	-0.02870804	0.025621706	0.013859629	0.911344678	0.998458023	0.971700121	1.025952763
4		Adult BMI		13	0.015479193	-0.00672556	0.037683946	0.011328956	0.171832618	1.015599616	0.993297006	1.038402989

**Table S3** Steiger directionality test of body size traits on kidney cancer and ccRCC

No.	Exposure	Outcome	SNO_R2.exposure	SNO_R2.outcome	Correct causal direction	Steiger P value
1	Birth weight	Kidney cancer	0.029264993	0.000526235	TRUE	0
2	Childhood obesity		0.027004347	2.50103E-05	TRUE	5.0347E-127
3	Childhood BMI		0.014816182	3.65726E-05	TRUE	8.2361E-113
4	Adolescent BMI		0.013228826	1.76093E-05	TRUE	2.84698E-76
5	Adult BMI		0.007450364	0.000248454	TRUE	1.5297E-240
1	Birth weight	ccRCC	0.029264993	0.000448691	TRUE	0
2	Childhood obesity		0.027004347	1.8792E-05	TRUE	5.6164E-128
3	Childhood BMI		0.014816182	2.91422E-05	TRUE	6.371E-114
4	Adolescent BMI		0.013228826	1.4112E-05	TRUE	8.49139E-77
5	Adult BMI		0.007450364	0.000232444	TRUE	2.2522E-242