

Supplementary Table SI. The data used in this study

	GWAS ID	Trait	Consortium	Sample size	Number of SNPs	Polulation	PMID
exposure	ebi-a-GCST006097	Moderate to vigorous physical activity levels	UKB	377,234	11,808,007	European	29899525
exposure	ebi-a-GCST006098	Vigorous physical activity	UKB	261,055	11,803,978	European	29899525
exposure	ebi-a-GCST006100	Strenuous sports or other exercises	UKB	350,492	11,807,536	European	29899525
outcome	ieu-a-1171	Knee osteoarthritis	arcOGEN	11,655	1,279,483	European	22763110

GWAS: genome-wide association study; UKB: UK Biobank; arcOGEN: Arthritis Research UK Osteoarthritis Genetics.

Supplementary Table SII. The IVs of MVPA and KOA.

	SNP	beta.exposure	se.exposure	pval.exposure	pval.outcome	R2	F
1	rs10157145	0.011814	0.002215	9.60E-08	0.99245	7.54E-05	28.45903
2	rs1043595	-0.01441	0.002454	4.30E-09	0.076597	9.14E-05	34.48103
3	rs11081859	-0.01847	0.003561	2.10E-07	0.48568	7.13E-05	26.91448
4	rs1921981	-0.01304	0.002371	3.80E-08	0.40266	8.01E-05	30.22366
5	rs2388195	0.01167	0.002229	1.70E-07	0.13243	7.26E-05	27.40065
6	rs4886868	0.012495	0.002266	3.50E-08	0.15659	8.06E-05	30.40437
7	rs662638	-0.01172	0.002221	1.30E-07	0.97283	7.39E-05	27.87053
8	rs6812265	-0.01137	0.002225	3.30E-07	0.3415	6.91E-05	26.08585
9	rs749256	-0.01325	0.00261	3.80E-07	0.21489	6.83E-05	25.78498
10	rs877483	-0.01223	0.002228	4.00E-08	0.082045	7.99E-05	30.13203
11	rs974471	-0.0136	0.002624	2.20E-07	0.785471	7.12E-05	26.85056

IVs: instrumental variable; MVPA: moderate to vigorous physical activity; KOA: knee osteoarthritis.

Supplementary Table SIII. The IVs of VPA and KOA.

	SNP	beta.exposure	se.exposure	pval.exposure	pval.outcome	R2	F
1	rs1248860	0.00977	0.001314	1.10E-13	0.86077	0.000212	55.25588
2	rs13243553	-0.00875	0.00135	9.00E-11	0.68489	0.000161	42.02049
3	rs328902	0.008789	0.001417	5.50E-10	0.90213	0.000147	38.4784
4	rs4556111	0.006835	0.001317	2.10E-07	0.76147	0.000103	26.9271

IVs: instrumental variable; VPA: vigorous physical activity; KOA: knee osteoarthritis.

Supplementary Table SIV. The IVs of SSOE and KOA.

	SNP	beta.exposure	se.exposure	pval.exposure	pval.outcome	R2	F
1	rs10946808	0.007708	0.001261	9.90E-10	0.47469	0.000107	37.3414
2	rs11000785	-0.00643	0.001247	2.60E-07	0.48501	7.57E-05	26.53949
3	rs11210230	0.009134	0.00173	1.30E-07	0.53349	7.96E-05	27.88769
4	rs1265178	-0.00731	0.001323	3.20E-08	0.063187	8.72E-05	30.5754
5	rs12821008	0.006003	0.001145	1.60E-07	0.44753	7.84E-05	27.49576
6	rs2148201	0.005772	0.00114	4.10E-07	0.28796	7.32E-05	25.64041
7	rs216211	-0.00656	0.001301	4.60E-07	0.18584	7.25E-05	25.40648
8	rs2470893	-0.0065	0.001195	5.50E-08	0.01491	8.43E-05	29.54182
9	rs2871340	0.005993	0.001129	1.10E-07	0.44016	8.04E-05	28.17958
10	rs288070	0.010599	0.001886	1.90E-08	0.48704	9.01E-05	31.57468
11	rs4084828	0.005799	0.00115	4.50E-07	0.1163	7.26E-05	25.45208
12	rs4411372	0.007024	0.001252	2.00E-08	0.94636	8.97E-05	31.45848
13	rs7031064	0.005711	0.001124	3.80E-07	0.22122	7.36E-05	25.7993
14	rs7034243	0.006302	0.001184	1.00E-07	0.4257	8.08E-05	28.33892
15	rs763187	0.00773	0.001518	3.50E-07	0.098708	7.40E-05	25.92684
16	rs896302	-0.00701	0.001245	1.70E-08	0.71666	9.06E-05	31.75866
17	rs9177	-0.00573	0.001136	4.60E-07	0.81881	7.26E-05	25.43493

IVs: instrumental variable; SSOE: strenuous sports or other exercises; KOA: knee osteoarthritis.