

Table S6. Sensitivity analysis of the association between cognitive function and arthritis using GEE models with different specifications in CHARLS, HRS, and ELSA.

Term	Estimate or	Standard errors	<i>P</i> value	Conf.low	Conf.high	Dataset	Model
(Intercept)	0.297501586	0.195094559	5.16E-10	0.202966562	0.436067857	CHARLS	Cognition Tertile
cognition_groupMid	0.966645569	0.053855183	0.528760044	0.869812509	1.0742587	CHARLS	Cognition Tertile
cognition_groupHigh	0.915364353	0.057694305	0.125328288	0.817493888	1.024951881	CHARLS	Cognition Tertile
age	1.001676627	0.002957028	0.571038523	0.995888032	1.007498869	CHARLS	Cognition Tertile
genderYes	0.71241003	0.057457992	3.60E-09	0.636534127	0.797330462	CHARLS	Cognition Tertile
marital_statusNever married/Other	0.881142671	0.075670289	0.094485238	0.759688524	1.02201413	CHARLS	Cognition Tertile
marital_statusSeparated/Divorced/Widowed	1.157872473	0.18288308	0.422831303	0.809077957	1.65703274	CHARLS	Cognition Tertile
educationSecondary	0.722220379	0.079016166	3.81E-05	0.618601625	0.843195774	CHARLS	Cognition Tertile
educationTertiary	0.65353252	0.19350739	0.027936683	0.447253156	0.954950789	CHARLS	Cognition Tertile
drinking_statusYes	1.068008414	0.052959421	0.214097131	0.962710112	1.184823923	CHARLS	Cognition Tertile
smoking_statusYes	0.981947827	0.057801357	0.752634589	0.876774296	1.099737459	CHARLS	Cognition Tertile
bmi	1.002349791	0.00209177	0.261848596	0.998248775	1.006467654	CHARLS	Cognition Tertile
depression_score	1.066979487	0.003733746	0	1.059199824	1.074816291	CHARLS	Cognition Tertile
hypertensionYes	1.045417643	0.051211916	0.385773709	0.94557975	1.155796798	CHARLS	Cognition Tertile
diabetesYes	1.072432192	0.086002487	0.416157241	0.90607551	1.269332184	CHARLS	Cognition Tertile
heart_diseaseYes	1.689405184	0.064620097	4.44E-16	1.488432335	1.917514022	CHARLS	Cognition Tertile
strokeYes	1.399677034	0.142047148	0.017927503	1.059539337	1.849007142	CHARLS	Cognition Tertile
cancerYes	1.022897244	0.223000227	0.919137493	0.660714551	1.583616965	CHARLS	Cognition Tertile
psychiatric_disorderYes	1.489198428	0.215605156	0.064736867	0.975953503	2.272354115	CHARLS	Cognition Tertile
(Intercept)	0.273098253	0.194702455	2.63E-11	0.18646095	0.399990754	CHARLS	Independence
executive_score	1.028835	7.07E-03	5.85844E-05	1.014668	1.04E+00	CHARLS	Independence
age	1.001824044	0.00298948	0.542127764	0.995971247	1.007711235	CHARLS	Independence
genderYes	0.709751529	0.057655009	2.74E-09	0.633913942	0.794661861	CHARLS	Independence
ruralYes	1.071224395	0.047082902	0.143932872	0.976794972	1.174782567	CHARLS	Independence
marital_statusNever married/Other	0.880215036	0.075618709	0.091551795	0.758965476	1.020834984	CHARLS	Independence
marital_statusSeparated/Divorced/Widowed	1.172188407	0.182986672	0.385274667	0.818915109	1.677860923	CHARLS	Independence
educationSecondary	0.731473906	0.079457607	8.31E-05	0.625985683	0.854738518	CHARLS	Independence
educationTertiary	0.670344205	0.194210114	0.039452165	0.458127024	0.980866287	CHARLS	Independence
drinking_statusYes	1.068362792	0.052938975	0.211619508	0.963068143	1.185169568	CHARLS	Independence
smoking_statusYes	0.979920332	0.057818461	0.725721676	0.874934628	1.097503545	CHARLS	Independence
bmi	1.002488357	0.002134909	0.244379991	0.998302364	1.006691902	CHARLS	Independence
depression_score	1.066324881	0.003757805	0	1.058500077	1.07420753	CHARLS	Independence
hypertensionYes	1.047149943	0.051246197	0.368633925	0.947082979	1.15778979	CHARLS	Independence
diabetesYes	1.081262601	0.086215968	0.364826792	0.913153981	1.280319459	CHARLS	Independence
heart_diseaseYes	1.700107409	0.064782104	2.22E-16	1.497385877	1.930274117	CHARLS	Independence
strokeYes	1.397048442	0.141643244	0.018245845	1.05838705	1.844074291	CHARLS	Independence
cancerYes	1.022671745	0.223064471	0.919945316	0.660485725	1.583467224	CHARLS	Independence
psychiatric_disorderYes	1.486455494	0.21577123	0.066194385	0.973838873	2.268907102	CHARLS	Independence
(Intercept)	0.273098253	0.194702455	2.63E-11	0.18646095	0.399990754	CHARLS	AR1
executive_score	1.011048	0.005262868	0.03683064	1.000672	1.021531	CHARLS	AR1
age	1.001824044	0.00298948	0.542127764	0.995971247	1.007711235	CHARLS	AR1
genderYes	0.709751529	0.057655009	2.74E-09	0.633913942	0.794661861	CHARLS	AR1
ruralYes	1.071224395	0.047082902	0.143932872	0.976794972	1.174782567	CHARLS	AR1
marital_statusNever married/Other	0.880215036	0.075618709	0.091551795	0.758965476	1.020834984	CHARLS	AR1
marital_statusSeparated/Divorced/Widowed	1.172188407	0.182986672	0.385274667	0.818915109	1.677860923	CHARLS	AR1
educationSecondary	0.731473906	0.079457607	8.31E-05	0.625985683	0.854738518	CHARLS	AR1
educationTertiary	0.670344205	0.194210114	0.039452165	0.458127024	0.980866287	CHARLS	AR1
drinking_statusYes	1.068362792	0.052938975	0.211619508	0.963068143	1.185169568	CHARLS	AR1

smoking_statusYes	0.979920332	0.057818461	0.725721676	0.874934628	1.097503545	CHARLS	AR1
bmi	1.002488357	0.002134909	0.244379991	0.998302364	1.006691902	CHARLS	AR1
depression_score	1.066324881	0.003757805	0	1.058500077	1.07420753	CHARLS	AR1
hypertensionYes	1.047149943	0.051246197	0.368633925	0.947082979	1.15778979	CHARLS	AR1
diabetesYes	1.081262601	0.086215968	0.364826792	0.913153981	1.280319459	CHARLS	AR1
heart_diseaseYes	1.700107409	0.064782104	2.22E-16	1.497385877	1.930274117	CHARLS	AR1
strokeYes	1.397048442	0.141643244	0.018245845	1.05838705	1.844074291	CHARLS	AR1
cancerYes	1.022671745	0.223064471	0.919945316	0.660485725	1.583467224	CHARLS	AR1
psychiatric_disorderYes	1.486455494	0.21577123	0.066194385	0.973838873	2.268907102	CHARLS	AR1
(Intercept)	0.00199754	0.183349267	0	0.001394531	0.002861295	HRS	Cognition Tertile
cognition_groupMid	1.056521806	0.043133334	0.202414322	0.97087497	1.149724075	HRS	Cognition Tertile
cognition_groupHigh	1.065723754	0.046116189	0.167494466	0.973622216	1.166537803	HRS	Cognition Tertile
age	1.071224421	0.001905839	0	1.067230459	1.07523333	HRS	Cognition Tertile
genderYes	0.578971675	0.03593814	0	0.539593509	0.621223559	HRS	Cognition Tertile
marital_statusNever married/Other	0.844746682	0.044352053	1.42E-04	0.774415362	0.921465396	HRS	Cognition Tertile
marital_statusSeparated/Divorced/Widowed	0.916225159	0.045951294	0.056904872	0.837314093	1.002573048	HRS	Cognition Tertile
educationSecondary	1.01363101	0.047611355	0.776131635	0.923321673	1.112773429	HRS	Cognition Tertile
educationTertiary	0.82068965	0.058855318	7.86E-04	0.731275829	0.921036188	HRS	Cognition Tertile
drinking_statusYes	0.930226234	0.036283023	0.046215005	0.86637202	0.998786695	HRS	Cognition Tertile
smoking_statusYes	1.214451527	0.049045968	7.45E-05	1.103143935	1.336990092	HRS	Cognition Tertile
bmi	1.054011543	0.003097635	0	1.047631758	1.060430179	HRS	Cognition Tertile
depression_score	1.111770849	0.009746839	0	1.090733766	1.133213676	HRS	Cognition Tertile
hypertensionYes	1.333668854	0.03651104	3.11E-15	1.241565841	1.43260434	HRS	Cognition Tertile
diabetesYes	1.051281325	0.043625906	0.251658208	0.965127102	1.145126297	HRS	Cognition Tertile
heart_diseaseYes	1.444828905	0.045649145	7.77E-16	1.321173332	1.580058055	HRS	Cognition Tertile
strokeYes	1.106599406	0.073398249	0.167577707	0.958327012	1.277812511	HRS	Cognition Tertile
cancerYes	1.352764341	0.054616699	3.16E-08	1.215436652	1.505608177	HRS	Cognition Tertile
psychiatric_disorderYes	2.179392616	0.052370448	0	1.966788541	2.41497857	HRS	Cognition Tertile
(Intercept)	0.002004996	0.182022956	0	0.00140338	0.00286452	HRS	Independence
executive_score	1.082033	3.62E-02	0.02946047	1.007899	1.16E+00	HRS	Independence
age	1.070774669	0.001918854	0	1.066755172	1.074809312	HRS	Independence
genderYes	0.579827974	0.036070691	0	0.540251195	0.622304	HRS	Independence
ruralYes	1.298230452	0.039675864	4.76E-11	1.201101295	1.403214129	HRS	Independence
marital_statusNever married/Other	0.85487733	0.044489246	4.24E-04	0.783491855	0.932766876	HRS	Independence
marital_statusSeparated/Divorced/Widowed	0.927444595	0.045926196	0.100990404	0.847608934	1.014799918	HRS	Independence
educationSecondary	0.995645325	0.048002877	0.927560087	0.906242731	1.093867658	HRS	Independence
educationTertiary	0.812298986	0.059477251	4.74E-04	0.722917575	0.912731501	HRS	Independence
drinking_statusYes	0.9494999	0.036553209	0.156291395	0.883854496	1.020020901	HRS	Independence
smoking_statusYes	1.203425779	0.049132813	1.64E-04	1.092942675	1.325077369	HRS	Independence
bmi	1.053711269	0.003097881	0	1.047332797	1.060128587	HRS	Independence
depression_score	1.115644544	0.009772395	0	1.09447934	1.137219043	HRS	Independence
hypertensionYes	1.334502327	0.036564638	3.00E-15	1.242211252	1.433650241	HRS	Independence
diabetesYes	1.060904465	0.043671423	0.175804279	0.973874725	1.155711565	HRS	Independence
heart_diseaseYes	1.428904191	0.045728771	6.00E-15	1.306407634	1.562886755	HRS	Independence
strokeYes	1.117026117	0.07340891	0.131661717	0.967336444	1.289879395	HRS	Independence
cancerYes	1.351835653	0.054652233	3.47E-08	1.214517651	1.504679353	HRS	Independence
psychiatric_disorderYes	2.157913158	0.052432835	0	1.947166338	2.391469648	HRS	Independence
(Intercept)	0.002004996	0.182022956	0	0.00140338	0.00286452	HRS	AR1
executive_score	1.122338	0.04486952	0.01010512	1.02785	1.225511	HRS	AR1
age	1.070774669	0.001918854	0	1.066755172	1.074809312	HRS	AR1

genderYes	0.579827974	0.036070691	0	0.540251195	0.622304	HRS	AR1
ruralYes	1.298230452	0.039675864	4.76E-11	1.201101295	1.403214129	HRS	AR1
marital_statusNever married/Other	0.85487733	0.044489246	4.24E-04	0.783491855	0.932766876	HRS	AR1
marital_statusSeparated/Divorced/Widowed	0.927444595	0.045926196	0.100990404	0.847608934	1.014799918	HRS	AR1
educationSecondary	0.995645325	0.048002877	0.927560087	0.906242731	1.093867658	HRS	AR1
educationTertiary	0.812298986	0.059477251	4.74E-04	0.722917575	0.912731501	HRS	AR1
drinking_statusYes	0.9494999	0.036553209	0.156291395	0.883854496	1.020020901	HRS	AR1
smoking_statusYes	1.203425779	0.049132813	1.64E-04	1.092942675	1.325077369	HRS	AR1
bmi	1.053711269	0.003097881	0	1.047332797	1.060128587	HRS	AR1
depression_score	1.115644544	0.009772395	0	1.09447934	1.137219043	HRS	AR1
hypertensionYes	1.334502327	0.036564638	3.00E-15	1.242211252	1.433650241	HRS	AR1
diabetesYes	1.060904465	0.043671423	0.175804279	0.973874725	1.155711565	HRS	AR1
heart_diseaseYes	1.428904191	0.045728771	6.00E-15	1.306407634	1.562886755	HRS	AR1
strokeYes	1.117026117	0.07340891	0.131661717	0.967336444	1.289879395	HRS	AR1
cancerYes	1.351835653	0.054652233	3.47E-08	1.214517651	1.504679353	HRS	AR1
psychiatric_disorderYes	2.157913158	0.052432835	0	1.947166338	2.391469648	HRS	AR1
(Intercept)	0.005959914	1.221275001	2.73E-05	5.44E-04	0.065281652	ELSA	Cognition Tertile
cognition_groupMid	1.143449431	0.244863125	0.584071878	0.707602066	1.8477569	ELSA	Cognition Tertile
cognition_groupHigh	1.098234113	0.302108729	0.756435525	0.607490532	1.985410642	ELSA	Cognition Tertile
age	1.053133986	0.015625272	9.22E-04	1.021370647	1.085885125	ELSA	Cognition Tertile
genderYes	0.553837582	0.228089916	0.009581601	0.354186443	0.866029948	ELSA	Cognition Tertile
marital_statusNever married/Other	0.681852084	0.366331535	0.295863935	0.332558616	1.398015994	ELSA	Cognition Tertile
marital_statusSeparated/Divorced/Widowed	0.772244921	0.27302523	0.343828003	0.452226037	1.318725965	ELSA	Cognition Tertile
educationSecondary	0.487306148	0.28771509	0.012471212	0.277267114	0.856456715	ELSA	Cognition Tertile
educationTertiary	0.29644139	0.363418284	8.21E-04	0.145410791	0.604339589	ELSA	Cognition Tertile
drinking_statusYes	0.482558231	0.323918479	0.024480887	0.255758348	0.910478378	ELSA	Cognition Tertile
smoking_statusYes	0.985309603	0.306577962	0.961498851	0.540272773	1.796934925	ELSA	Cognition Tertile
bmi	1.066887492	0.019594311	9.52E-04	1.02669138	1.108657326	ELSA	Cognition Tertile
depression_score	1.145387175	0.053353808	0.010952855	1.031662091	1.271648723	ELSA	Cognition Tertile
hypertensionYes	1.382545829	0.248443694	0.192293938	0.849579218	2.249858434	ELSA	Cognition Tertile
diabetesYes	0.831375518	0.432978919	0.669729767	0.355831923	1.942448688	ELSA	Cognition Tertile
heart_diseaseYes	1.658850353	0.297100946	0.088466141	0.926647217	2.96961394	ELSA	Cognition Tertile
strokeYes	1.19804917	0.61951534	0.770538328	0.355747805	4.034661049	ELSA	Cognition Tertile
cancerYes	1.747396623	0.38445772	0.146577974	0.822508676	3.712295137	ELSA	Cognition Tertile
psychiatric_disorderYes	2.065709565	0.340372782	0.03305542	1.060091674	4.025270749	ELSA	Cognition Tertile
(Intercept)	0.004608035	1.304886502	3.74E-05	3.57E-04	0.059461676	ELSA	Independence
executive_score	1.05858	1.67E-02	0.000649569	1.024503	1.09E+00	ELSA	Independence
age	1.055132636	0.016095946	8.56E-04	1.022365446	1.088950028	ELSA	Independence
genderYes	0.570225846	0.230383866	0.014760457	0.36303107	0.895674069	ELSA	Independence
marital_statusNever married/Other	0.677657085	0.369508582	0.292314504	0.328460922	1.398093635	ELSA	Independence
marital_statusSeparated/Divorced/Widowed	0.755108163	0.273686663	0.304733573	0.441617886	1.291135063	ELSA	Independence
educationSecondary	0.466017998	0.289714366	0.008402299	0.26411762	0.822257806	ELSA	Independence
educationTertiary	0.274658231	0.369615382	4.72E-04	0.133099197	0.566773846	ELSA	Independence
drinking_statusYes	0.472619693	0.325451679	0.021287656	0.249739273	0.894410286	ELSA	Independence
smoking_statusYes	0.963923697	0.309925594	0.905628147	0.525089716	1.76950503	ELSA	Independence
bmi	1.066509468	0.019576733	0.001004845	1.026362958	1.108226321	ELSA	Independence
depression_score	1.154290035	0.053608402	0.007438489	1.039162322	1.282172627	ELSA	Independence
hypertensionYes	1.378280763	0.248647813	0.196937268	0.84661955	2.243815255	ELSA	Independence
diabetesYes	0.856352748	0.4252205	0.715344167	0.372138283	1.970611629	ELSA	Independence
heart_diseaseYes	1.65334672	0.296083318	0.089474572	0.92541676	2.953864132	ELSA	Independence

strokeYes	1.205751826	0.60249494	0.756144648	0.370180302	3.927376627	ELSA	Independence
cancerYes	1.770641547	0.384098068	0.13688551	0.834037892	3.75902764	ELSA	Independence
psychiatric_disorderYes	2.061854829	0.336001075	0.031272941	1.067218759	3.983480706	ELSA	Independence
(Intercept)	0.004608035	1.304886502	3.74E-05	3.57E-04	0.059461676	ELSA	AR1
executive_score	1.021729	0.005581573	0.000117503	1.010612	1.032	ELSA	AR1
age	1.055132636	0.016095946	8.56E-04	1.022365446	1.088950028	ELSA	AR1
genderYes	0.570225846	0.230383866	0.014760457	0.36303107	0.895674069	ELSA	AR1
marital_statusNever married/Other	0.677657085	0.369508582	0.292314504	0.328460922	1.398093635	ELSA	AR1
marital_statusSeparated/Divorced/Widowed	0.755108163	0.273686663	0.304733573	0.441617886	1.291135063	ELSA	AR1
educationSecondary	0.466017998	0.289714366	0.008402299	0.26411762	0.822257806	ELSA	AR1
educationTertiary	0.274658231	0.369615382	4.72E-04	0.133099197	0.566773846	ELSA	AR1
drinking_statusYes	0.472619693	0.325451679	0.021287656	0.249739273	0.894410286	ELSA	AR1
smoking_statusYes	0.963923697	0.309925594	0.905628147	0.525089716	1.76950503	ELSA	AR1
bmi	1.066509468	0.019576733	0.001004845	1.026362958	1.108226321	ELSA	AR1
depression_score	1.154290035	0.053608402	0.007438489	1.039162322	1.282172627	ELSA	AR1
hypertensionYes	1.378280763	0.248647813	0.196937268	0.84661955	2.243815255	ELSA	AR1
diabetesYes	0.856352748	0.4252205	0.715344167	0.372138283	1.970611629	ELSA	AR1
heart_diseaseYes	1.65334672	0.296083318	0.089474572	0.92541676	2.953864132	ELSA	AR1
strokeYes	1.205751826	0.60249494	0.756144648	0.370180302	3.927376627	ELSA	AR1
cancerYes	1.770641547	0.384098068	0.13688551	0.834037892	3.75902764	ELSA	AR1
psychiatric_disorderYes	2.061854829	0.336001075	0.031272941	1.067218759	3.983480706	ELSA	AR1

AR1: first-order autoregressive; BMI: body mass index; CHARLS: China Health and Retirement Longitudinal Study; Conf: 95% confidence intervals; ELSA: English Longitudinal Study of Ageing; GEE: Generalised Estimating Equations; HRS: Health and Retirement Study; OR: odds ratio