**Table S1.** Methodological quality of the studies with (poly)phenols-rich supplementation assessed with the PEDro scale.

	Items	Antom et al. [48]	Huhn et al. [27]	Kritz- Silvers tein et al. [49]	Mastr oiacov o et al. [19]	Mix & Crews. [50]	Bowte 11 et al. [54]	Witte et al. [55]	Franci s et al. [28]	Masse e et al. [23]	Dietz et al. [51]	Haske Il Ramsa y et al. [52]	Karab ay et al. [53]	Decroi x et al. [56]	Sadow ska- Krępa et al. [57]	Sadow ska- Krępa et al. [58]
1	Eligibility criteria were specified	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
2	Subjects were randomly allocated to groups (in a crossover study, subjects were randomly allocated an order in which treatments were	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
3	received) Allocation was concealed	-	+	+	+	+	+	+	+	-	+	+	+	+	+	+
4	The groups were similar at baseline regarding the most important	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
5	prognostic indicators There was blinding of all subjects	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
6	There was blinding of all therapists who administered the therapy	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+
7	There was blinding of all assessors who measured at least one key outcome	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

8	Measures of at least one key outcome were obtained from more than 85% of the subjects initially allocated to groups	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
9	All subjects for whom outcome measures were available received the treatment or control condition as allocated or, where this was not the case, data for at least one key outcome was analysed by "intention to treat"	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
10	The results of between- group statistical comparisons are reported for at least one key outcome The study provides both	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
11	point measures and measures of variability for at least one key outcome	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Total score	8	9	9	9	9	9	9	9	7	9	9	9	9	9	9

Table S2. Meta-regression for gender, phenolic dose and nature of phenolic compound to predict the effect of (poly) phenols-rich supplementation on psychomotor functions.

Variables			Psychomoto	or functions			
Decimal	Coefficient	SE	95% lower CI	95% upper CI	Z-value	P value	
Gender	-0.02	0.008	-0.036	0.004	-2.48	0.013	
Phenolic dose	0.001	0.001	-0.001	0.002	-0.75	0.453	
Categorical	Q		Ć	lf	P va	lue	
Nature of phenolic compound	7.62		1	6	0.267		

Abbreviations: SE: standard error, CI: confidence interval.

Table S3. Meta-regression for gender, phenolic dose and nature of phenolic compound to predict the effect of (poly) phenols-rich supplementation on BDNF blood concentrations.

Variables		BDNF										
Decimal	Coefficient	SE	95% lower CI	95% upper CI	Z-value	P value						
Gender	0.001	0.028	-0.054	0.055	0.02	0.982						
Phenolic dose	0.004	0.002	-0.001	0.008	1.68	0.093						
Categorical	Q		Ċ	lf	P va	alue						
Nature of phenolic compound			N.	A								

 $Abbreviations: NA: not applicable, SE: standard\ error,\ BDNF:\ Brain-Derived\ Neurotrophic\ Factor,\ CI:\ confidence\ interval.$ 

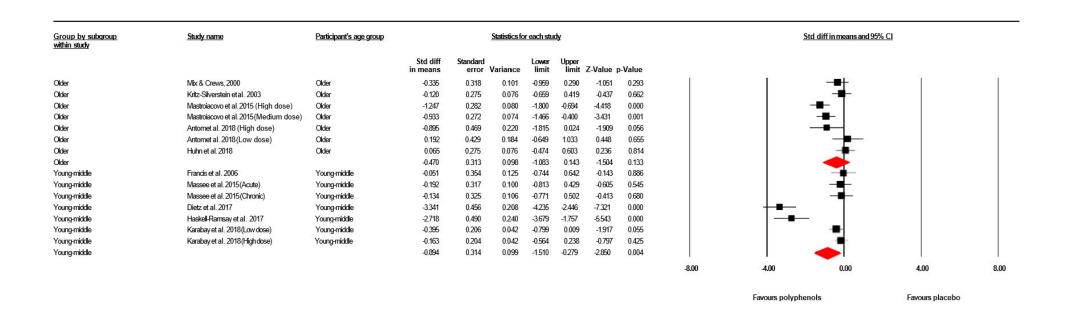


Figure S1. Plot of studies investigating the effect of (poly)phenols-rich supplementation on psychomotor function in old- and young/middle-aged adults.

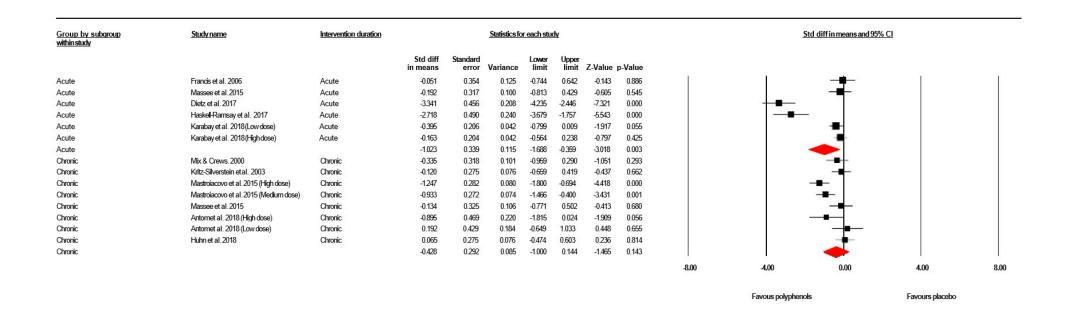
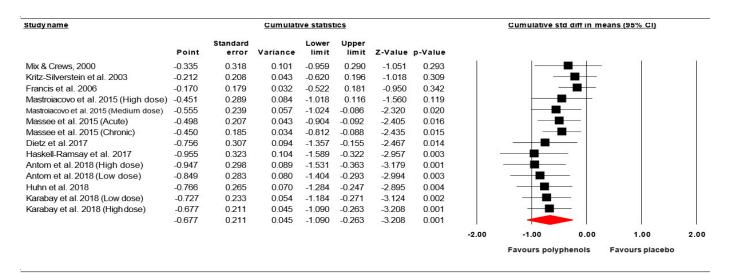


Figure S2. Plot of studies investigating the acute and chronic effect of (poly) phenols-rich supplementation on psychomotor function.

Group by subgroup	Study name	Human bioavailability			Statistics for	r each stu	dy				Std diffin means and 95% CI						
within study			Stddiff in means	Standard error	Variance	Lower	Upper limit	Z-Value	p-Value								
Low	Mix & Crews, 2000	Low	-0.335	0.318	0.101	-0.959	0.290	-1.051	0.293	1	1	- <del></del>					
Low	Haskell-Ramsay et al. 2017	Low	-2.718	0.490	0.240	-3.679	-1.757	-5.543	0.000		_						
Low	Antomet al. 2018 (High dose)	Low	-0.895	0.469	0.220	-1.815	0.024	-1.909	0.056			-					
Low	Antomet al. 2018 (Low dose)	Low	0.192	0.429	0.184	-0.649	1.033	0.448	0.655								
Low	Huhn et al. 2018c	Low	0.065	0.275	0.076	-0.474	0.603	0.236	0.814			-					
Low			-0.678	0.392	0.154	-1.446	0.091	-1.728	0.084								
Medium	Francis et al. 2006	Medium	-0.051	0.354	0.125	-0.744	0.642	-0.143	0.886			_					
Medium	Mastroiacovo et al. 2015 (High dose)	Medium	-1.247	0.282	0.080	-1.800	-0.694	-4.418	0.000			-					
Medium	Mastroiacovo et al. 2015 (Medium dose)	Medium	-0.933	0.272	0.074	-1.466	-0.400	-3.431	0.001			-					
Medium	Massee et al. 2015 (Acute)	Medium	-0.192	0.317	0.100	-0.813	0.429	-0.605	0.545								
Medium	Massee et al. 2015 (Chronic)	Medium	-0.134	0.325	0.106	-0.771	0.502	-0.413	0.680			-					
Medium	Dietz et al. 2017 (Acute)	Medium	-3.341	0.456	0.208	-4235	-2.446	-7.321	0.000		-						
Medium	Karabay et al. 2018 (Low dose)	Medium	-0.395	0.206	0.042	-0.799	0.009	-1.917	0.055			-					
Medium	Karabay et al. 2018 (High dose)	Medium	-0.163	0.204	0.042	-0.564	0.238	-0.797	0.425			-					
Medium			-0.760	0.297	0.088	-1.341	-0.178	-2.562	0.010					1			
										-8.00	4.00	0.00	4.00	8.00			
											Favours polypher	-1-	Favours placebo				

Figure S3. Plot of studies investigating the effect of (poly) phenols-rich supplementation with low and medium human bioavailability on psychomotor function.



udy name		<u>S1</u>	atistics with	studyren	noved			Std	diff in means	95% CI) wit	th study removed	
	Point	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value					
lix & Crews, 2000	-0.707	0.227	0.051	-1.152	-0.263	-3.118	0.002		-		1	
ritz-Silverstein et al. 2003	-0.726	0.227	0.052	-1.171	-0.281	-3.198	0.001					
rancis et al. 2006	-0.726	0.223	0.050	-1.164	-0.289	-3.252	0.001		-			
fastroiacovo et al. 2015 (High dose)	-0.630	0.219	0.048	-1.060	-0.200	-2.872	0.004		+-			
astroiacovo et al. 2015 (Medium dose)	-0.659	0.227	0.051	-1.103	-0.215	-2.908	0.004		-			
assee et al. 2015 (Acute)	-0.718	0.226	0.051	-1.161	-0.275	-3.179	0.001		-			
assee et al. 2015 (Chronic)	-0.722	0.225	0.051	-1.163	-0.281	-3.208	0.001		-			
ietz et al. 2017	-0.483	0.164	0.027	-0.804	-0.162	-2.946	0.003		_	-		
askell-Ramsay et al. 2017	-0.541	0.193	0.037	-0.920	-0.162	-2.797	0.005			<del></del>		
ntom et al. 2018 (High dose)	-0.664	0.221	0.049	-1.098	-0.231	-3.002	0.003					
ntom et al. 2018 (Low dose)	-0.737	0.220	0.048	-1.168	-0.307	-3.357	0.001					
uhn et al. 2018	-0.740	0.224	0.050	-1.178	-0.301	-3.308	0.001		-			
arabay et al. 2018 (Low dose)	-0.709	0.237	0.056	-1.173	-0.245	-2.994	0.003					
arabay et al. 2018 (Highdose)	-0.727	0.233	0.054	-1.184	-0.271	-3.124	0.002		-			
	-0.677	0.211	0.045	-1.090	-0.263	-3.208	0.001					
								-2.00	-1.00	0.00	1.00	2
									Favours poly	phenois	Favours placebo	,

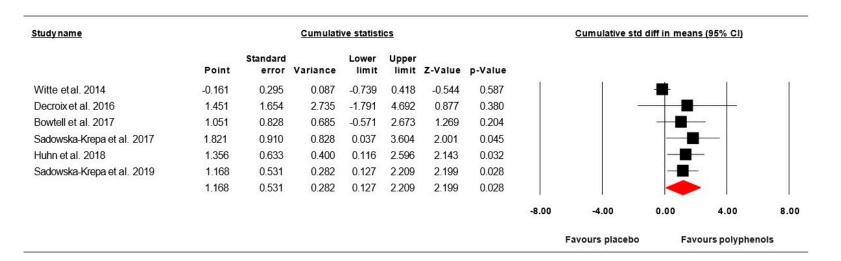
Figure S4. Cumulative statistics and statistics with study removed for studies investigating the effect of (poly)phenols-rich supplementation on psychomotor functions.

Group by subgroup within study	<u>Study name</u>	Subgroup within study		Stati	stics for ea	ch study				Sto	d diffin means and 95%	<u>6CI</u>	
		Std diff inmeans	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value					
Older	Witte et al. 2014	-0.161 Older	0.295	0.087	-0.739	0.418	-0.544	0.587	Ī	i i	-	3	Ī
Older	Bowtell et al. 2017	0.411 Older	0.397	0.158	-0.368	1.190	1.033	0.301			-		
Older	Huhn etal. 2018	-0.004 Older	0.275	0.075	-0.543	0.534	-0.016	0.987			-		
Older		0.073	0.536	0.287	-0.977	1.123	0.136	0.892					
Young-middle	Decroix et al. 2016	3.148 Young-middle	0.611	0.373	1.951	4.346	5.154	0.000					
Young-middle	Sadowska-Krepa et al. 2017	4.442 Young-middle	0.878	0.770	2.722	6.162	5.061	0.000					
Young-middle	Sadowska-Krepa et al. 2019	0.400 Young-middle	0.505	0.255	-0.590	1.389	0.791	0.429			-		
Young-middle		2.409	0.629	0.395	1.176	3.641	3.831	0.000		83			
									-8.00	4.00	0.00	4.00	8.00
										Favours placebo		Favours polyphenols	

Figure S5. Plot of studies investigating the effect of (poly) phenols-rich supplementation on BDNF in old- and young/middle-aged adults.

Group by subgroup within study	Study name	Subgroup within study		Stat	istics for ea	ch study				Std diff in means and 95% CI					
		Std diff inmeans	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value							
Low	Witte et al. 2014	-0.161 Low	0.295	0.087	-0.739	0.418	-0.544	0.587	*	1			4		
.ow	Bowtell et al. 2017	0.411 Low	0.397	0.158	-0.368	1.190	1.033	0.301			-				
Low	Huhn etal. 2018	-0.004 Low	0.275	0.075	-0.543	0.534	-0.016	0.987			: - <del></del>				
Low	Sadowska-Krepa et al. 2019	0.400 Low	0.505	0.255	-0.590	1.389	0.791	0.429							
Low		0.065	0.169	0.029	-0.267	0.396	0.383	0.701			•				
Medium	Decroix et al. 2016	3.148 Medium	0.611	0.373	1.951	4.346	5.154	0.000			. 2	-			
Vledium	Sadowska-Krepa et al. 2017	4.442 Medium	0.878	0.770	2.722	6.162	5.061	0.000							
Medium		3.570	0.501	0.251	2.588	4.553	7.121	0.000	8		100				
									-8.00	-4.00	0.00	4.00	8.0		
										Favours placebo		Favours polyphenols			

 $\textbf{Figure S6.} \ Plot \ of studies \ investigating \ the \ effect \ of \ (poly) phenols-rich \ supplementation \ with \ low \ and \ medium \ human \ bioavailability \ on \ BDNF.$ 



Study name		<u>s</u>	tatistics with	study re	emoved			<u>\$</u>	STD diff in means (9	study remove	ed	
	Point	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value					
Witte et al. 2014	1.519	0.680	0.462	0.186	2.851	2.233	0.026			-		
Decroix et al. 2016 (Acute)	0.712	0.459	0.211	-0.188	1.612	1.549	0.121			+=		
Bowtell et al. 2017	1.379	0.665	0.442	0.076	2.682	2.075	0.038					
Sadowska-Krepa et al. 2017 (Chronic)	0.643	0.436	0.190	-0.211	1.498	1.476	0.140			+	_	
Huhn et al. 2018	1.497	0.706	0.499	0.112	2.881	2.119	0.034			-	-	
Sadowska-Krepa et al. 2019 (Chronic)	1.356	0.633	0.400	0.116	2.596	2.143	0.032			-		
	1.168	0.531	0.282	0.127	2.209	2.199	0.028		J.			
								-4.00	-2.00	0.00	2.00	4.00
									Favours placebo	Fav	ours polypher	nols

Figure S7. Cumulative statistics and statistics with study removed for studies investigating the effect of (poly)phenols-rich supplementation on BDNF.