Supplementary materials to: Zhong Z, Xu K, Zhou R, et al. Effects of aerobic and mind–body exercise on older adults' anxiety: A systematic review and meta-analysis. Ann Acad Med Singap 2026;55:Online First. DOI: https://doi.org/10.47102/annals-acadmedsg.202653

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Appendix S1. PRISMA 2020 checklist.

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Page 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Page 1-2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Page3-6
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Page 6
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Page 8–12
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Page 7-8
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Page 7-8
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Page 8
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Page 10-11
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Page 9-11,13
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Page 10-12
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Page 12
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Page 13
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Page 9-13

Section and Topic	Item #	Checklist item	Location where item is reported
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Page 10-11,13
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Page 13-14
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Page 13-14
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Page 13-14
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Page 14
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Page 13-14
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Page 12
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Page 14-15,42
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Page 15
Study characteristics	17	Cite each included study and present its characteristics.	Page 15-16,36-39
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Page 17,43
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Page 36-39,44-48
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Page 15-17
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Page 17-20,40,44-48
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Page 18-19,40,45-48
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Page 18,20
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Page 19-20
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Page 20,41

Section and Topic	Item #	Checklist item	Location where item is reported
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Page 20-25
	23b	Discuss any limitations of the evidence included in the review.	Page 22,26-28
	23c	Discuss any limitations of the review processes used.	Page 26-28
	23d	Discuss implications of the results for practice, policy, and future research.	Page 25,28-29
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Page 7,30
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Page 7,30
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Page 7
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Page 29
Competing interests	26	Declare any competing interests of review authors.	Page 30
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Page 30

Appendix S2. Search strategy.

Database	Search strategy	amount
PubMed		
#1	Search: Aged[MeSH Terms] Sort by: Most Recent	3,803,388
#2	Search:(((Aged) OR (elderly)) OR (Older people)) OR (older adult)	6,741,635
#3	#1 OR #2	6,741,635
#4	Search: exercise[MeSH Terms] Sort by: Most Recent	280,774
#5	Search:((((((((((((Exercise) OR (Physical Exercise)) OR (Physical Activity)) OR (aerobic exercise)) OR (Aerobic Physical)) OR (aerobic training)) OR (oxygen sports)) OR (Aerobic Activity)) OR (Acute Exercise)) OR (Jogging)) OR (Walking)) OR (dance)) OR (Tai Chi)) OR (Baduanjin)) OR (Qigong) Sort by: Most Recent	968,543
#6	#4 OR #5	968,543
#7	Search: anxiety[MeSH Terms] Sort by: Most Recent	132,172
#8	Search:(((((((((anxiety) OR (Anxiet)) OR (Angst)) OR (Social anxiety)) OR (Anxiety disorder)) OR (anxious)) OR (Nervousness)) OR (Hypervigilance)) OR (Anxiety, Social)) OR (Anxiousness) Sort by: Most Recent	435,114
#9	#7 OR #8	435,114
#10	Search: randomized controlled trial[MeSH Terms] Sort by: Most Recent	194,019
#11	Search: ((((randomized controlled trial) OR (randomised controlled trial)) OR (Controlled clinical trial)) OR (randomize)) OR (randomly) Sort by: Most Recent	2,050,040
#12	#10 OR #11	2,050,040
#13	#3 AND #6 AND #9 AND #12	2675

Cochrane		
#1	MeSH descriptor: [Aged] explode all trees	287,712
#2	(Aged OR elderly OR Older people)	747,918
#3	#1 or #2	747,918
#4	MeSH descriptor: [Exercise] explode all trees	41,560
#5	(Exercise OR Physical Exercise OR Physical Activity OR aerobic exercise OR Aerobic Physical OR aerobic training OR oxygen sports OR Aerobic Activity OR acute activity OR acute exercise or jogging OR walking OR dance OR Tai Chi OR Baduanjin OR Qigong)	224,534
#6	#4 or #5	226,732
#7	MeSH descriptor: [Anxiety] explode all trees	13,928
#8	(anxiety OR anxiet OR angst OR social anxiety OR anxiety disorder OR anxious OR nervousness OR hypervigilance OR anxiety, social OR anxiousness)	96,120
#9	#7 or #8	96,402
#10	MeSH descriptor: [Randomized Controlled Trial] explode all trees	34
#11	((randomized controlled trial OR randomised controlled trial ORControlled clinical trial OR randomize or randomly))	1,330,819
#12	#10 or #11	1,330,819
#13	#3 and #6 and #9 and #12	4786

Web of Science		
#1	TS=(Aged OR elderly OR Older people)	10,257,817

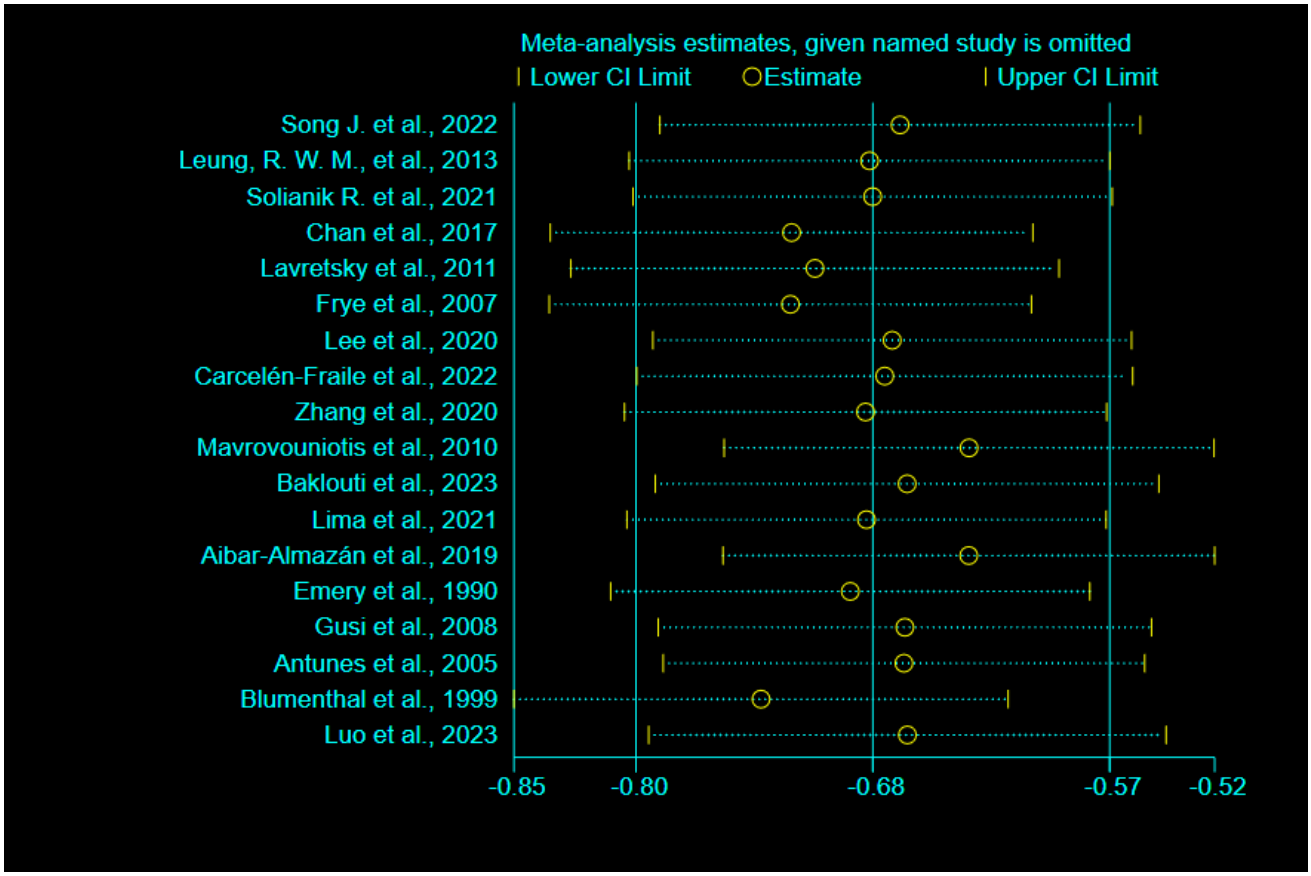
#2	TS=(Exercise OR Physical Exercise OR Physical Activity OR aerobic exercise OR Aerobic Physical OR aerobic training OR oxygen sports OR Aerobic Activity OR Acute Exercise OR Jogging OR Walking OR dance OR Tai Chi OR Baduanjin OR Qigong)	2,541,352
#3	TS=(anxiety OR anxiet OR angst OR Social anxiety OR nervousness OR Anxiety disorder OR anxious OR Hypervigilance OR Anxiety, Social OR Anxiousness)	777,662
#4	TS=(randomized controlled trial OR randomised controlled trial OR Controlled clinical trial OR randomize OR randomly)	2,573,203
#5	#1 AND #2 AND #3 AND #4	5,849

Embase		
#1	'aged'/exp OR 'aged' OR 'elderly' OR 'older people'	7,132,755
#2	'exercise'/exp OR 'physical exercise' OR 'physical activity' OR 'aerobic exercise' OR 'aerobic physical' OR 'aerobic training' OR 'oxygen sports ' OR 'aerobic activity' OR 'acute exercise ' OR 'jogging' OR 'walking' OR 'dance' OR 'tai chi' OR 'baduanjin' OR 'qigong'	1,020,194
#3	'anxiety'/exp OR 'anxiety' OR anxiet* OR 'angst' OR 'social anxiety' OR 'anxiety disorder*' OR 'anxious' OR 'nervousness' OR 'hypervigilance' OR 'anxiety, social' OR 'anxiousness'	674,784
#4	'randomized controlled trial'/exp OR 'randomised controlled trial' OR 'controlled clinical trial' OR randomize OR randomized OR randomised OR randomly	2,549,202
#5	#1 AND #2 AND #3 AND #4	4547

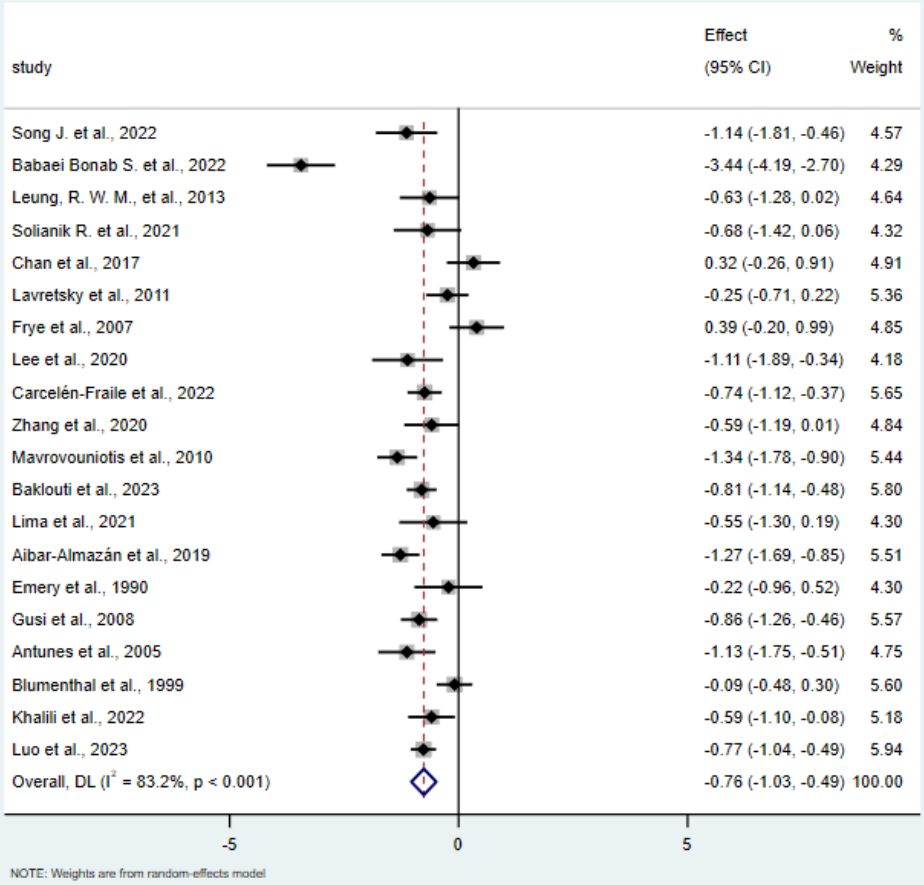
Appendix S3. Publication bias and sensitivity analyses.

Appendix S3A. Sensitivity analysis.

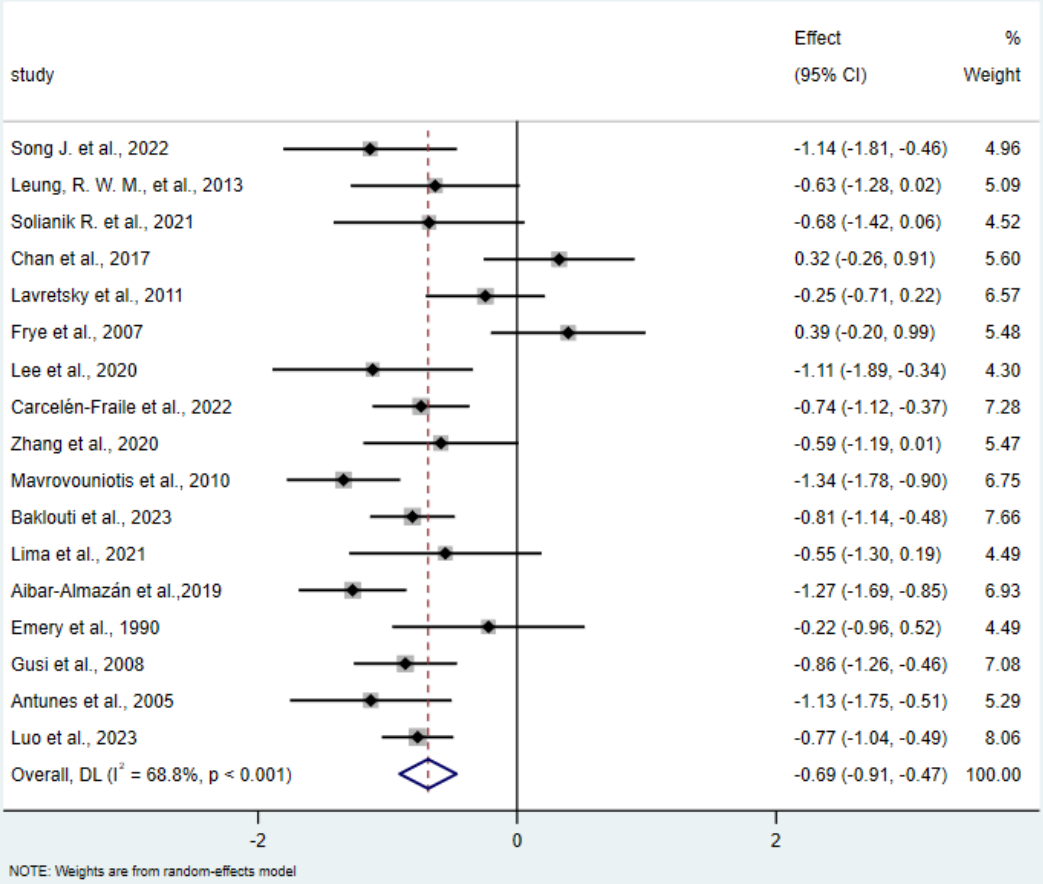
eFigure S3A-3-1. Leave-one-out sensitivity analysis plot.



eFigure S3A-3-2. Forest plot of the construct-sensitivity analysis including trials assessing death anxiety and social physique anxiety.

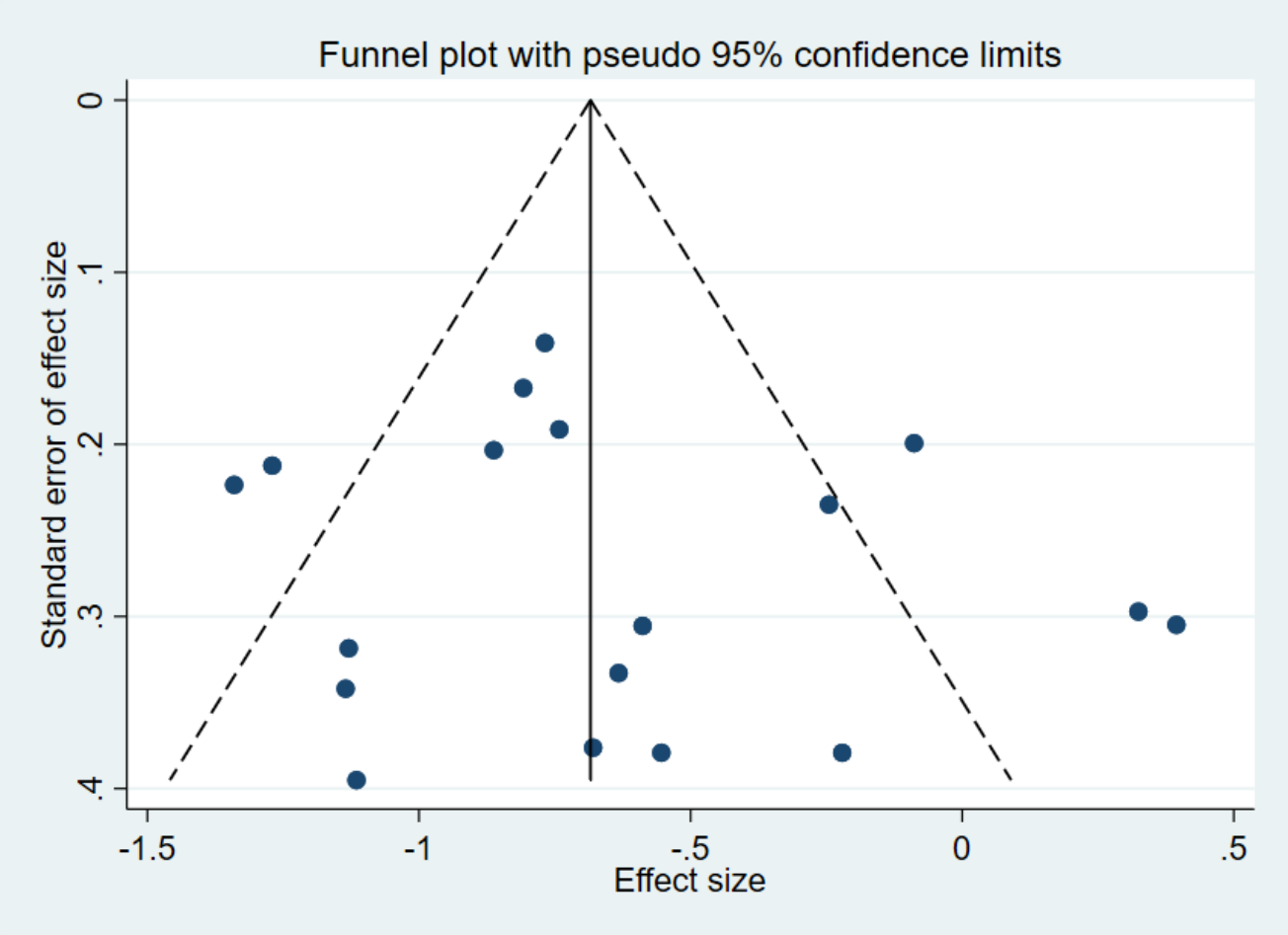


eFigure S3A-3-3 Forest plot of the sensitivity analysis excluding Blumenthal et al. (1999), which used sertraline as an active comparator.

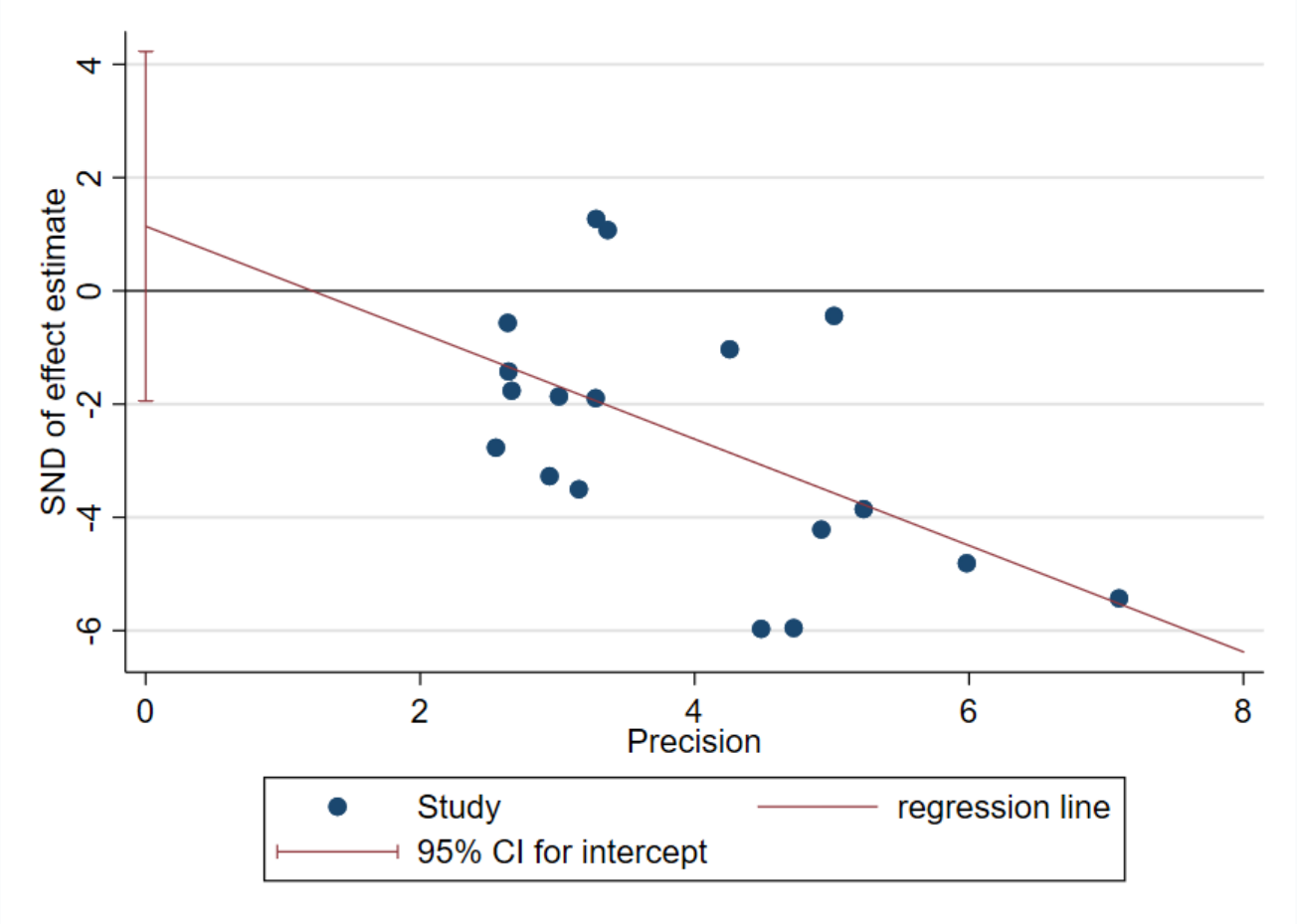


Appendix S3B. Assessment of publication bias.

eFigure S3B-1-1. Unfilled funnel plot for assessment of publication bias.



eFigure S3B-1-2. Egger's regression scatter plot.

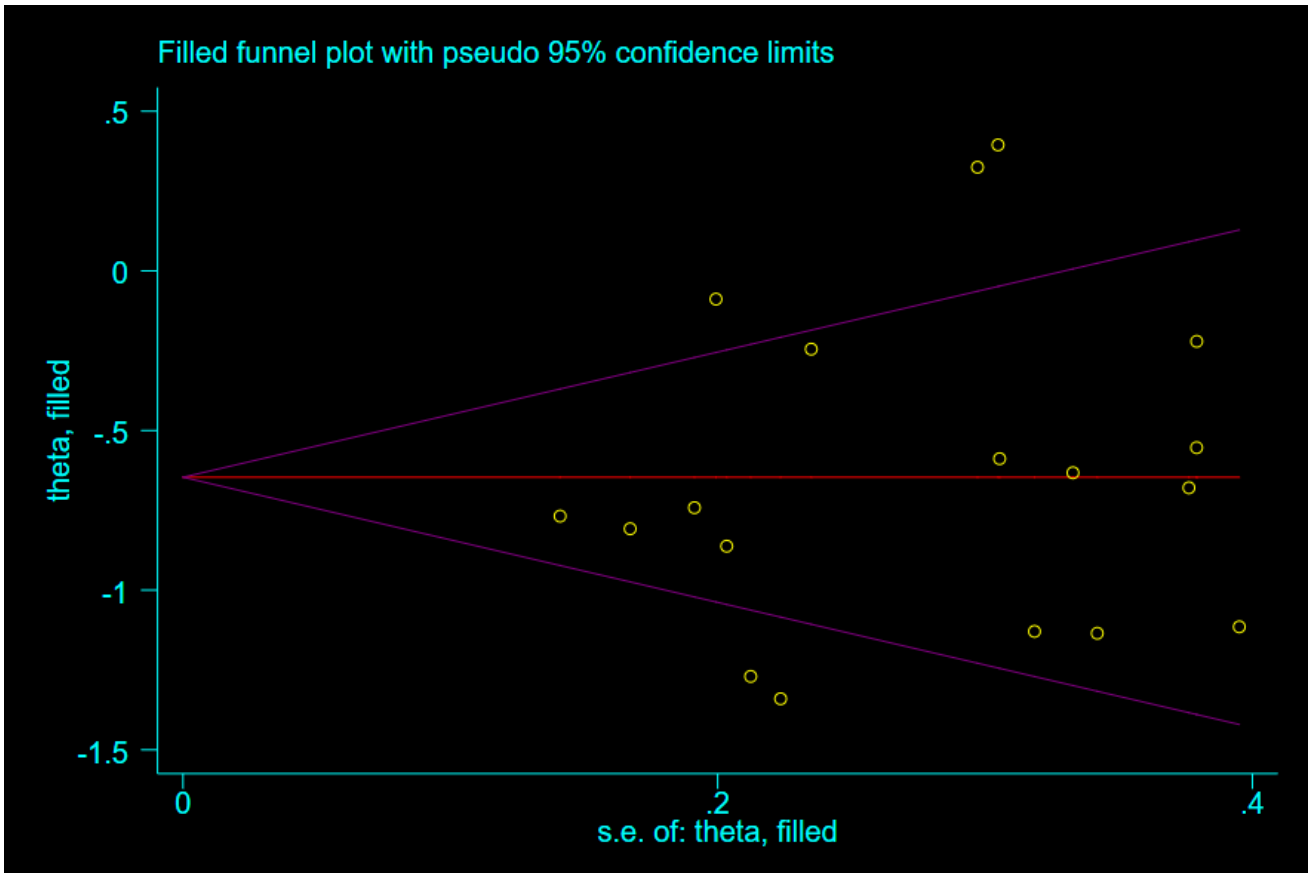


eTable S3B-1. Summary of Begg's and Egger's tests.

Test	Statistic	SE	t / z	P	95% CI
Begg's Test	0.0588	—	—	0.762	—
Egger's Test	1.07	1.47	0.73	0.478	(−2.04,4.18)

Appendix S3C. Trim-and-fill adjustment.

eFigure S3C-2-1. Filled funnel plot after trim-and-fill adjustment.



eTable S3C-2-1 Results of trim-and-fill analysis.

Model	Number of imputed studies	Adjusted SMD	95% CI
Fixed-effects	0	−0.68	(−0.80 , −0.57)
Random-effects	0	−0.65	(−0.87 , −0.42)