

eTable 1. Applied keywords and the search results from each database

Database	Keywords	Filter	Date (yyyy/mm/dd)	Result
PubMed	(adhd OR hkd OR add OR Attention deficit hyperactivity disorder OR attention deficit OR hyperactivity OR inattentive OR impulsivity OR neurodevelopmental disorder) and (probiotics OR gut microbiota OR gut-brain axis OR bifidobacteria OR lactobacillus)	RCT	2023/04/06	45
Embase	(adhd OR hkd OR add OR Attention deficit hyperactivity disorder OR attention deficit OR hyperactivity OR inattentive OR impulsivity OR neurodevelopmental disorder) and (probiotics OR gut microbiota OR gut-brain axis OR bifidobacteria OR lactobacillus)	RCT	2023/04/06	440
Cochrane CENTRAL	(adhd OR hkd OR add OR Attention deficit hyperactivity disorder OR attention deficit OR hyperactivity OR inattentive OR impulsivity OR neurodevelopmental disorder) and (probiotics OR gut microbiota OR gut-brain axis OR bifidobacteria OR lactobacillus)	Trials	2023/04/06	181
ScienceDirect	(Attention deficit hyperactivity disorder OR inattentive OR neurodevelopmental	Research	2023/04/06	306

disorder) and (probiotics)	articles		
ClinicalTrials.gov (Attention deficit hyperactivity disorder) and (Probiotics)	NA	2023/04/06	6

Abbreviations: NA, not applied; RCT, randomized controlled trial

eTable 2 Reasons for study exclusion

Reason	Number of excluded studies	References
No probiotics treatment group	3	[1-3]
Not targeting children and adolescents	5	[4-8]
No behavioral outcome for symptoms of ADHD	12	[9-20]
Not Randomized	2	[21, 22]
Not clinical trials	3	[23-25]

ADHD Attention deficit hyperactivity disorder

RCT randomized controlled trials

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eTable 3. Grading of Recommendations Assessments, Development and Evaluation (GRADE) assessment of the strength of evidence for standard weighted meta-analysis

Outcome	Design	Risk of bias	Indirectness	Inconsistency	Imprecision	Publication bias	Grade Quality
Total symptoms	RCT x 7	No serious	Serious indirectness	Serious inconsistency	No serious imprecision	Serious publication bias	⊕○○○ ^{2,3,5}
Inattention	RCT x 4	No serious	Serious indirectness	No serious inconsistency	No serious imprecision	Serious publication bias	⊕⊕○○ ^{2,5}
Hyperactivity/impulsivity	RCT x 4	No serious	Serious indirectness	No serious inconsistency	No serious imprecision	Serious publication bias	⊕⊕○○ ^{2,5}
Numbers of dropout	RCT x 5	No serious	No serious indirectness	No Serious inconsistency	Serious imprecision	Serious publication bias	⊕⊕○○ ^{4,5}

*Risk of bias was estimated using Cochrane risk of bias, studies were classified as having low risk of bias if none of the domains above was rated as high risk of bias and three or less were rated as unclear risk; moderate if one was rated as high risk of bias or none was rated as high risk of bias but four or more were rated as unclear risk, and all other cases were assumed to pertain to high risk of bias.

Down-graded due to: ¹ risk of bias, ² indirectness, ³ Inconsistency, ⁴ Imprecision, ⁵ publication bias

GRADE Working Group grades of evidence:

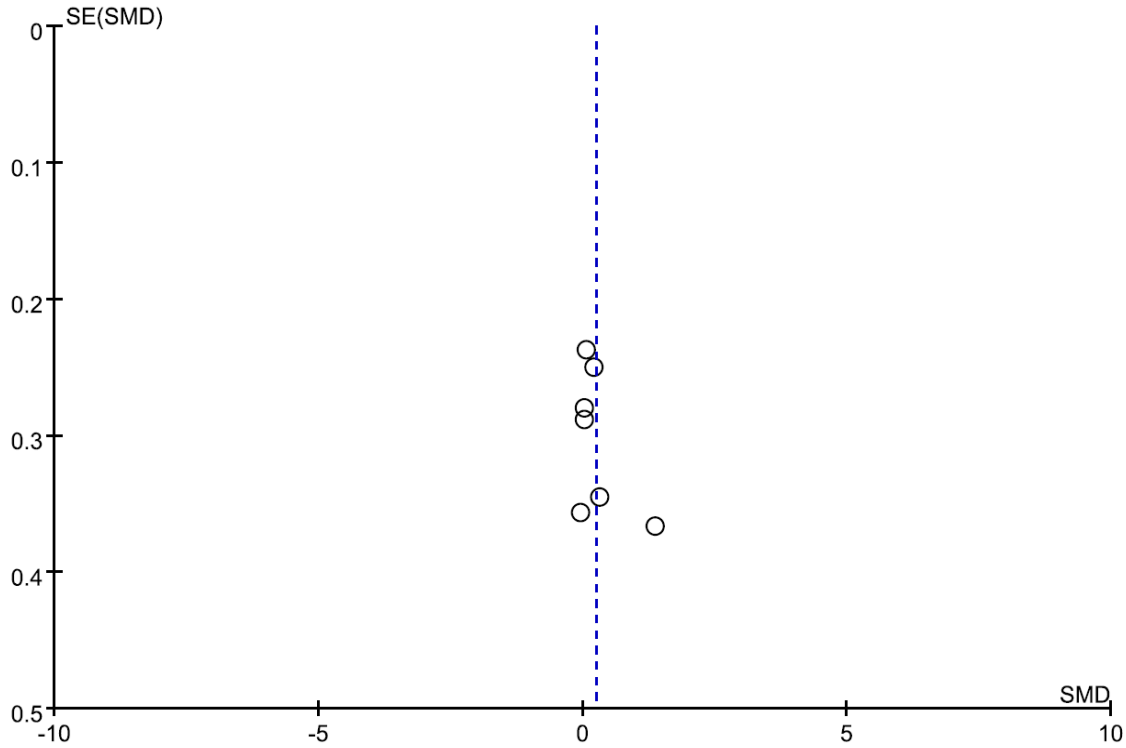
-**High certainty:** We are very confident that the true effect lies close to that of the estimate of the effect

-**Moderate certainty:** We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.

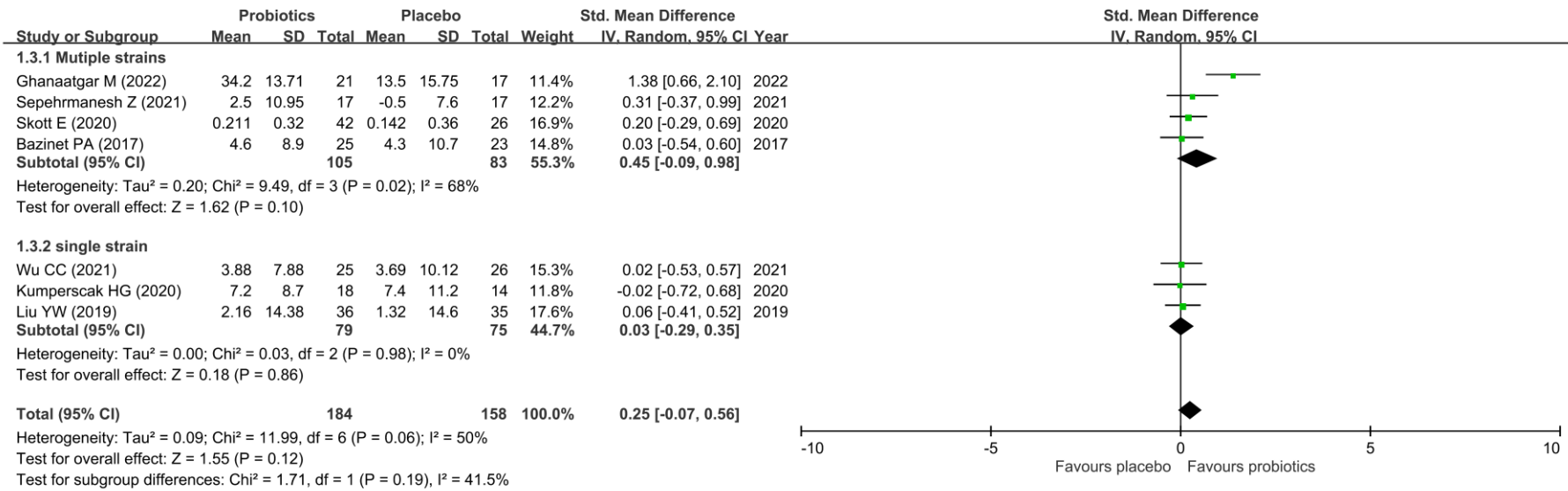
-**Low certainty:** Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect.

-**Very low certainty:** We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect.

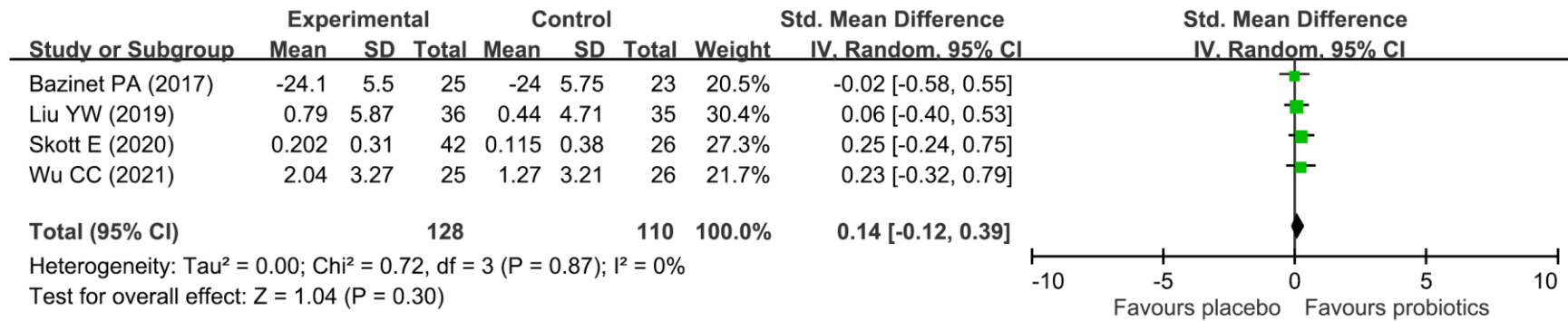
eFigure 1. Funnel plot – ADHD total



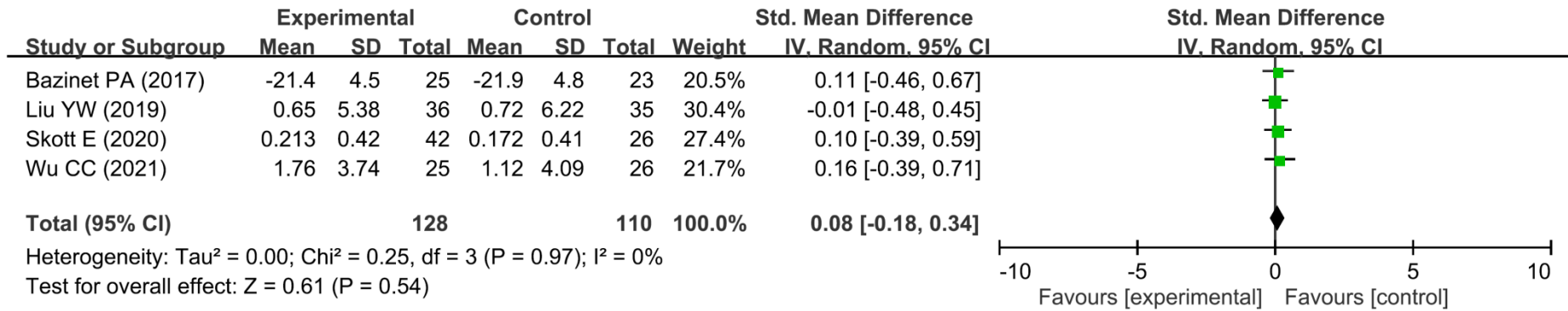
eFigure 2. Subgroup analysis - forest plot of effect sizes in subgroup of studies using multiple strains of probiotics versus those using a single strain



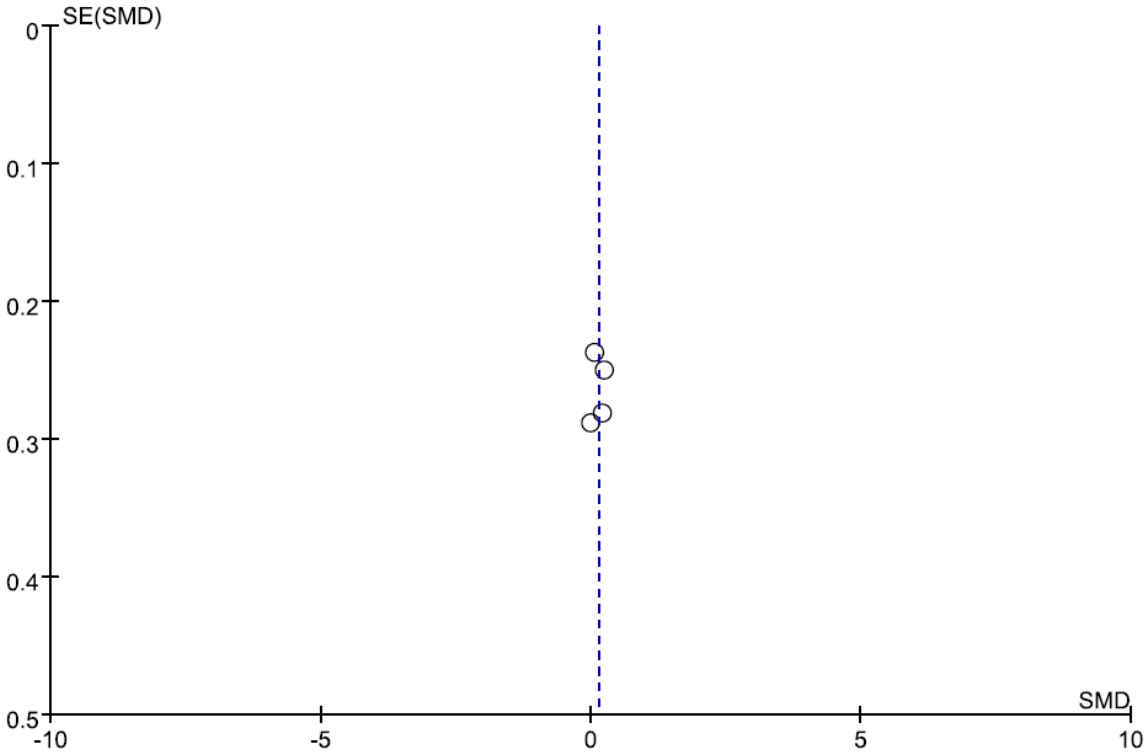
eFigure 3. Forest plot of effect size for comparing the difference in the improvement of inattention between probiotics and placebo groups



eFigure 4. Forest plot of effect size for comparing the difference in the improvement of hyperactivity/impulsivity between probiotics and placebo groups



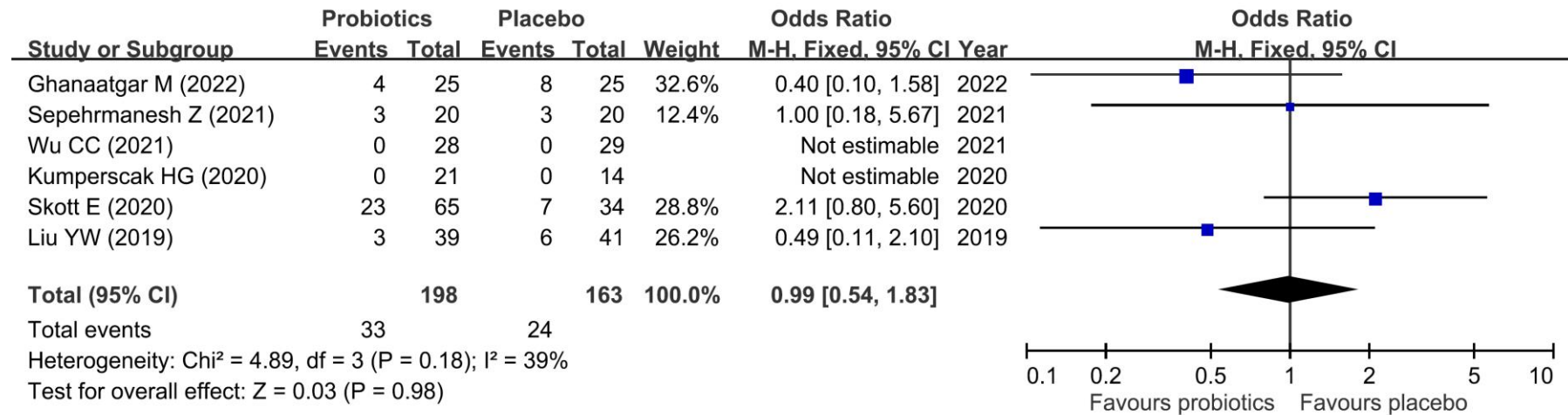
eFigure 5. Funnel plot – inattention



eFigure 6. Funnel plot – hyperactivity/impulsivity



eFigure 7. Forest plot of odds ratio for comparing the difference in the numbers of dropout between probiotics and placebo groups



eFigure 8. Funnel plot – dropout

