Supplemental Online Content

Supplementary Table 1. Journal Articles Excluded During Full-Text Screening

Author(s)	Year	Title	DOI/URL	Reason for Exclusion
Abozayed	2022	Online Multicomponent Program for Mental Health Promotion of Medical Students: An Intervention Study	10.3889/OAMJMS.2022.9174	Wrong Age
AreskougSandberg	2024	A 10-week school-based mindfulness intervention and symptoms of depression and anxiety among school children and adolescents: A controlled study.	10.1007/s12310-023-09620-y	Wrong Intervention Format
Bacio	2020	Facilitating Change in Drinking Cognitions and Behaviors Among Three Immigrant Generations of Latinx Youth Through a School-Based Intervention: Findings From a Multi-Site Clinical Trial.	10.3389/fpsyt.2020.574487	Wrong Intervention Format
Badesha	2023	Mental health mobile application self-help for adolescents exhibiting psychological distress: A single case experimental design.	10.1111/papt.12436	Mental health Diagnosis
Barral	2022	A Pilot Intervention to Reduce Adolescent Sexual and Mental Health Disparities by Increasing Access to Telemedicine and Mobile Care (AccessKCTeen)	10.1016/j.jadohealth.2022.01.136	No Mental Health Outcomes
Bei	2011	Development & feasibility trial of a mindfulness-based multi-component in-school group sleep intervention for poor sleep & anxiety symptoms in adolescent girls	10.1111/j.1479-8425.2011.00518.x	Wrong Article Type

Bisal	2022	Feasibility of a secondary school-based mental health intervention: Reprezents' On The Level	s13034-022-00534-2.pdf	No Mental Health Outcomes
Carriere	2024	Winner for Life: A three-year study of student-athletes' life skills development in a training programme for coaches and teachers.	10.1016/j.psychsport.2023.102573	Wrong Intervention Format
Chen	2023	Creating youth engaging platform for early mental health intervention: Preliminary findings from LevelMind@JC project in Hong Kong	10.1111/eip.13408	Wrong Article Type
Coughlin	2009	A controlled clinical evaluation of the parents plus children's programme: a video-based programme for parents of children aged 6 to 11 with behavioural and developmental problems.	10.1177/1359104509339081	Wrong Intervention Format
CraigRushing	2021	Efficacy of an mHealth Intervention (BRAVE) to Promote Mental Wellness for American Indian and Alaska Native Teenagers and Young Adults: Randomized Controlled Trial.	10.2196/26158	Wrong Age
deJong	2023	The efficacy of a self-help parenting program for parents of children with externalizing behavior: a randomized controlled trial.	10.1007/s00787-022-02028-0	Mental Health Diagnosis
Dickter	2019	Impact of an online depression prevention intervention on suicide risk factors for adolescents and young adults.	10.21037/mhealth.2019.04.01	Mental Health Diagnosis
Dietvorst	2021	A serious game smart phone application (Grow it!) that promotes wellbeing and resilience in Dutch adolescents during the COVID -19 pandemic	10.1111/bdi.13097	Wrong Article Type

Foskolos	2023	Brief parenting seminars for preventing child behavioral and emotional difficulties: A pilot randomized controlled trial.	10.1007/s10826-023-02653-6	Wrong Intervention Format
Haggerty	2023	Two-Year Risk Behavior Outcomes from Connecting, a Prevention Program for Caregivers and Youth in Foster Care.	10.1007/s11121-022-01390-4	Wrong Article Type
Haggerty	2023	Family, Mental Health, and Placement Outcomes of a Low-cost Preventive Intervention for Youth in Foster Care.	10.1016/j.childyouth.2023.106973	No Mental Health Outcomes
Haug	2023	Predictors of Youth Accessibility for a Mobile Phone-Based Life Skills Training Program for Addiction Prevention.	10.3390/ijerph20146379	Wrong Intervention Format
Hennefield	2024	Early Emotion Development Intervention Improves Mental Health Outcomes in Low-Income, High-Risk Community Children.	10.1007/s10578-023-01639-1	Mental Health Diagnosis
Hill	2023	Open trial of a brief, web-assisted behavioural intervention to reduce thwarted belongingness and suicidal ideation among adolescents: The Supporting Grieving Teens intervention.	10.1002/capr.12582	Mental Health Diagnosis
Huen	2016	Evaluation of a digital game-based learning program for enhancing youth mental health: A structural equation modeling of the program effectiveness	10.2196/mental.5656	Insufficient Data
Ji	2023	Effectiveness of an integrated motivational cognitive-behavioral group intervention for adolescents with gaming disorder: a randomized controlled trial	10.1111/add.16292	Wrong Intervention Format
Jolley	2023	A cluster randomised, 16-week, parallel-group multicentre trial to compare the effectiveness of a digital school-based	10.1186/s13063-023-07267-3	Wrong Article Type

		cognitive behavioural resilience/wellbeing-building intervention targeting emotional and behavioural problems in vulnerable Year 4 prima		
Jones	2024	Technology-enhanced program for child disruptive behavior disorders: development and pilot randomized control trial.	10.1080/15374416.2013.822308	Mental Health Diagnosis
Kierfeld	2013	Effectiveness of telephone-assisted parent-administered behavioural family intervention for preschool children with externalizing problem behaviour: a randomized controlled trial.	10.1007/s00787-013-0397-7	Mental Health Diagnosis
Kirchner	2022	Effects of "It Gets Better" Suicide Prevention Videos on Youth Identifying as Lesbian, Gay, Bisexual, Transgender, Queer, or Other Sexual or Gender Minorities: A Randomized Controlled Trial.	10.1089/lgbt.2021.0383	Wrong Age
KleinVelderman	2006	Preventing preschool externalizing behavior problems through video-feedback intervention in infancy.	10.1002/imhj.20104	Wrong Intervention Format
LeverTaylor	2014	The effectiveness of self-help mindfulness-based cognitive therapy in a student sample: a randomised controlled trial.	10.1016/j.brat.2014.09.007	Wrong Age
Lockwood	2022	Effectiveness, User Engagement and Experience, and Safety of a Mobile App (Lumi Nova) Delivering Exposure-Based Cognitive Behavioral Therapy Strategies to Manage Anxiety in Children via Immersive Gaming Technology: Preliminary Evaluation Study.	10.2196/29008	Mental Health Diagnosis

Lohaus	2009	Stress prevention in adolescence: Effects of a training program with an accompanying internet platform.	10.1026/0943-8149.17.1.13	Wrong Article Type
MacIsaac	2021	Adverse Childhood Experiences and Building Resilience With the JoyPop App: Evaluation Study.	10.2196/25087	Wrong Age
Miller-Chagnon	2024	The benefits of mindfulness training for momentary mindfulness and emotion regulation: A randomized controlled trial for adolescents exposed to chronic stressors.	10.1037/ccp0000910	Wrong Intervention Format
O'Kearney	2006	Effects of a cognitive-behavioural internet program on depression, vulnerability to depression and stigma in adolescent males: a school-based controlled trial.	10.1080/16506070500303456	Mental Health Diagnosis
Pisani	2018	Mobile Phone Intervention to Reduce Youth Suicide in Rural Communities: Field Test.	10.2196/10425	Wrong Article Type
Poppelaars	2016	A randomized controlled trial comparing two cognitive-behavioral programs for adolescent girls with subclinical depression: A school-based program (Op Volle Kracht) and a computerized program (SPARX).	10.1016/j.brat.2016.03.005	Mental Health Diagnosis
RivaCrugnola	2021	Video-feedback attachment based intervention aimed at adolescent and young mothers: Effectiveness on infant-mother interaction and maternal mind-mindedness.	10.1080/03004430.2019.1652172	Wrong Intervention Format
Sanchez	2017	Improving Children's Mental Health with a Digital Social Skills Development Game: A Randomized Controlled	10.1089/g4h.2015.0108	Mental Health Diagnosis

		Efficacy Trial of Adventures aboard the S.S. GRIN.		
Saulsberry	2013	Chicago Urban Resiliency Building (CURB): An internet-based depression-prevention intervention for urban African-American and Latino adolescents.	10.1007/s10826-012-9627-8	Wrong Article Type
Schoneveld	2018	Preventing Childhood Anxiety Disorders: Is an Applied Game as Effective as a Cognitive Behavioral Therapy-Based Program?.	10.1007/s11121-017-0843-8	Wrong Article Type
Sim	2022	The Role of Parent Engagement in a Web-Based Preventive Parenting Intervention for Child Mental Health in Predicting Parenting, Parent and Child Outcomes.	10.3390/ijerph19042191	Wrong Article Type
Soares	2022	The effects of engagement with an online depression prevention program for adolescents on suicide risk factors.	10.1007/s41347-022-00249-3	Mental Health Diagnosis
Spence	2019	Social support as a predictor of treatment adherence and response in an open-access, self-help, internet-delivered cognitive behavior therapy program for child and adolescent anxiety.	10.1016/j.invent.2019.100268	Mental Health Diagnosis
St-Pierre	2017	Evaluation of a school-based gambling prevention program for adolescents: Efficacy of using the theory of planned behaviour.	10.4309/jgi.2017.36.6	Wrong Intervention Format
Stewart	2020	Feasibility and effectiveness of a telehealth service delivery model for treating childhood posttraumatic stress: A community-based, open pilot trial of	10.1037/int0000225	Mental Health Diagnosis

		trauma-focused cognitive-behavioral therapy		
Thorsen	2018	Using High-Risk Adolescents' Voices to Develop a Comprehensible Cognitive Behavioral Therapy-Based Text-Message Program.	10.1080/08964289.2016.1223597	Mental Health Diagnosis
Willems	2024	Mental health app boost my mood (BMM) as preventive early intervention for adolescents with (sub)clinical depressive symptoms.	10.1186/s12889-024-19666-5	Mental Health Diagnosis
Williamson	2019	A Web-Based Self-Help Psychosocial Intervention for Adolescents Distressed by Appearance-Affecting Conditions and Injuries (Young Persons' Face IT): Feasibility Study for a Parallel Randomized Controlled Trial.	10.2196/14776	Mental Health Diagnosis
Wols	2018	In-Game Play Behaviours during an Applied Video Game for Anxiety Prevention Predict Successful Intervention Outcomes	10.1007/s10862-018-9684-4	No Mental Health Outcomes
Zhang	2023	A randomized control trial establishing the effectiveness of using interactive television-based art, music, and poetry therapies for treating the post-traumatic stress disorder of children exposed to traumatic events.	10.1016/j.psychres.2023.115582	Wrong Intervention Format

Supplementary Table 2. PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	1
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	3
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	3-4
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	4-5; 24-25
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.	22-24
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	22
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.	22-24
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.	22-24
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.	4-5
	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.	22-24
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.	6-8; 26
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.	9-16
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)).	25-27

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.	25-27
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	25-27
	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.	27-28
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	27-28
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	27
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	26
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	27-28
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.	4-5
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	4
Study characteristics	17	Cite each included study and present its characteristics.	6
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	6-8
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.	9-16
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	9-16
	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.	9-16
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	9-16
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	9-16
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	9-16
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	9-16

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.	16-19
	23b	Discuss any limitations of the evidence included in the review.	22
	23c	Discuss any limitations of the review processes used.	22
	23d	Discuss implications of the results for practice, policy, and future research.	19-22
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.	22
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	22
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	22
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	28
Competing interests	26	Declare any competing interests of review authors.	29
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.	28

Supplementary Table 3. Representative Search Strategy

Ovid MEDLINE(R) and In-Process, In-Data-Review & Other Non-Indexed Citations <1946 to July 03, 2024>

#	Searches	Results	Type
1	(Promot* or prevent* or benefit* or develop* or reduce or help* or effectiveness or project or universal or experiences or (skill* adj2 build*) or (teacher adj2 led) or (school adj2 based) or "school-based" or "after school").ti.	1780389	Advanced
2	(trials or trial or intervention or app evaluat* or application* or (app* adj2 mental health) or (app* adj2 restructuring) or program* or (mobile adj2 app)).ti.	1095505	Advanced
3	(mind or mindful* or psychosocial* or (mental adj2 (health or well-being or wellness or "well being")) or (emotional* adj2 (health or well-being or wellbeing or wellness or "well being")) or resilien* or (cognit* adj2 (music or musical or skill or skills or ability or abilities)) or (life adj2 skill*) or behaviour* or behavior* or stress* or suicide or antecedents).ti.	882996	Advanced
4	(infan* or child* or adolescen* or youth* or student* or girl or girls or boy or boys or teen*).ti.	1496824	Advanced
5	1 and 2 and 3 [****Base clinical set no age groups*****]	8746	Advanced
6	limit 5 to "all child (0 to 18 years)"	2802	Advanced
7	6 or (4 and 5) [****Final results version 1*****]	3448	Advanced

Embase <1974 to 2024 July 03>

#	Searches	Results	Type
1	(Promot* or prevent* or benefit* or develop* or reduce or help* or effectiveness or project or universal or experiences or (skill* adj2 build*) or (teacher adj2 led) or (school adj2 based) or "school-based" or "after school").ti.	2139219	Advanced
2	(trials or trial or intervention or app evaluat* or application* or (app* adj2 mental health) or (app* adj2 restructuring) or program* or (mobile adj2 app)).ti.	1382020	Advanced

#	Searches	Results	Type
3	(mind or mindful* or psychosocial* or (mental adj2 (health or well-being or wellness or "well being")) or (emotional* adj2 (health or well-being or wellbeing or wellness or "well being")) or resilien* or (cognit* adj2 (music or musical or skill or skills or ability or abilities)) or (life adj2 skill*) or behaviour* or behavior* or stress* or suicide or antecedents).ti.	999199	Advanced
4	(infan* or child* or adolescen* or youth* or student* or girl or girls or boy or boys or teen*).ti.	1726409	Advanced
5	1 and 2 and 3 [****Base clinical set no age groups*****]	10069	Advanced
6	limit 5 to (infant <to one year> or child <unspecified age> or preschool child <1 to 6 years> or school child <7 to 12 years> or adolescent <13 to 17 years>)	3068	Advanced
7	6 or (4 and 5) [****Final results version 1*****]	3621	Advanced

APA PsycInfo <1806 to June Week 4 2024>

#	Searches	Results	Type
1	(Promot* or prevent* or benefit* or develop* or reduce or help* or effectiveness or project or universal or experiences or (skill* adj2 build*) or (teacher adj2 led) or (school adj2 based) or "school-based" or "after school").ti.	458946	Advanced
2	(trials or trial or intervention or app evaluat* or application* or (app* adj2 mental health) or (app* adj2 restructuring) or program* or (mobile adj2 app)).ti.	233428	Advanced
3	(mind or mindful* or psychosocial* or (mental adj2 (health or well-being or wellness or "well being")) or (emotional* adj2 (health or well-being or wellbeing or wellness or "well being")) or resilien* or (cognit* adj2 (music or musical or skill or skills or ability or abilities)) or (life adj2 skill*) or behaviour* or behavior* or stress* or suicide or antecedents).ti.	580825	Advanced
4	(infan* or child* or adolescen* or youth* or student* or girl or girls or boy or boys or teen*).ti.	800582	Advanced
5	1 and 2 and 3 [****Base clinical set no age groups*****]	7565	Advanced
6	limit 5 to (100 childhood <birth to age 12 yrs> or 200 adolescence <age 13 to 17 yrs>)	2628	Advanced
7	6 or (4 and 5) [****Final results version 1*****]	3392	Advanced

Emotion – Hybrid – Post-Intervention (Immediate) < 1-month

Study or Subgroup	SMD	SE	Experimental Total	Control Total	Weight	Std. mean difference IV, Random, 95% CI	Risk of Bias A B C D E F G
✔ Calear 2016[a]	0.02215	0.060228	427	778	9.5%	0.02 [-0.10 , 0.14]	+ + − − ? +
✔ DeSmet 2018[b]	-0.240044	0.137426	120	96	4.8%	-0.24 [-0.51 , 0.03]	+ + + + ? +
✔ Estrada 2024[c]	-0.205	0.887771	19	11	0.2%	-0.20 [-1.94 , 1.53]	+ ? − ? + +
✔ Fridrici 2007[b]	-0.276791	0.129678	176	91	5.2%	-0.28 [-0.53 , -0.02]	+ + ? ? + +
✔ Gefter 2024b[d]	0.25	0.854	25	25	0.2%	0.25 [-1.42 , 1.92]	− − + − +
✔ Goodman 2014a[e]	-0.499596	0.445224	10	11	0.7%	-0.50 [-1.37 , 0.37]	? ? ? ? + +
✔ Ko 2023[c]	-0.826297	0.269734	30	30	1.8%	-0.83 [-1.35 , -0.30]	? ? ? ? + +
✔ Lang 2009[c]	-0.23282	0.297092	25	21	1.5%	-0.23 [-0.82 , 0.35]	+ + + + + ?
✔ Lappalainen 2021b[f]	-0.119749	0.166945	64	82	3.7%	-0.12 [-0.45 , 0.21]	+ + ? + + ?
✔ Mesurado 2022[c]	-0.014768	0.07384	421	325	8.5%	-0.01 [-0.16 , 0.13]	+ ? ? − + +
✔ Nagamitsu 2022[c]	-0.526023	0.171438	69	72	3.6%	-0.53 [-0.86 , -0.19]	+ + + + + +
✔ Neal-Barnett 2019[d]	-0.271561	0.167455	72	72	3.7%	-0.27 [-0.60 , 0.06]	− − − ? − +
✔ Perry 2017[g]	-0.217928	0.099566	206	200	6.8%	-0.22 [-0.41 , -0.02]	+ + ? + + +
✔ Peuters 2024a[h]	-0.27	0.063777	155	95	9.2%	-0.27 [-0.40 , -0.14]	− − ? ? + +
✔ Pisani 2024[c]	-0.022721	0.13485	111	109	4.9%	-0.02 [-0.29 , 0.24]	+ ? − ? + +
✔ Schoneveld 2016[c]	-0.349214	0.123111	134	134	5.5%	-0.35 [-0.59 , -0.11]	+ + + + + +
✔ Waters 2019[c]	-0.295641	0.171831	100	52	3.6%	-0.30 [-0.63 , 0.04]	+ + ? ? + +
✔ Waters 2024a[i]	-0.228237	0.227231	39	39	2.3%	-0.23 [-0.67 , 0.22]	? ? ? − − +
✔ Whittaker, 2017[c]	0.035021	0.069218	418	417	8.8%	0.04 [-0.10 , 0.17]	+ + + + + +
✔ Wong 2014a[j]	-0.142761	0.154435	101	72	4.2%	-0.14 [-0.45 , 0.16]	+ + + + − +
✔ Zagni 2024[c]	-0.2	0.035715	389	424	11.2%	-0.20 [-0.27 , -0.13]	+ + − − ? +
Total (Wald[k])			**3111**	**3156**	**100.0%**	**-0.18 [-0.26 , -0.11]**	

Test for overall effect: Z = 4.69 (P < 0.00001)
Test for subgroup differences: Not applicable
Heterogeneity: Tau² (DL[l]) = 0.01; Chi² = 42.82, df = 20 (P = 0.002); I² = 53%

Favours [experimental]   Favours [control]

Footnotes
[a] Hybrid - Between - Randomized (E-GAD Arm measured at posttest)
[b] Hyrbid - Between - Randomized
[c] Hybrid - Between - Randomized
[d] Hybrid - Within - Non-Randomized
[e] Hybrid (9th grade group sessions) - Within-Randomized; prettest (control) posttest (intervention)
[f] Hybrid (iACTface)- Between - Randomized
[g] Hybrid - Between - Randomized - Posttest
[h] Hybrid (In-School) - Between - quasi-Randomized
[i] Hybrid - Within - Non-Randomized; In-person + remote real time.
[j] Hybrid (Depression Intervention) - Between - Randomized
[k] CI calculated by Wald-type method.
[l] Tau² calculated by DerSimonian and Laird method.

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

Emotion – Virtual – Post-Intervention (Immediate) < 1-month

Study or Subgroup	SMD	SE	Experimental Total	Control Total	Weight	Std. mean difference IV, Random, 95% CI	Std. mean difference IV, Random, 95% CI	Risk of Bias A B C D E F G
✔ Cheng 2024[a]	-0.539301	0.125429	137	127	8.4%	-0.54 [-0.79 , -0.29]		
✔ Gefter 2024a[b]	-0.475362	0.133758	115	115	8.3%	-0.48 [-0.74 , -0.21]		
✔ Lappalainen 2021a[c]	0.025178	0.170724	59	82	7.7%	0.03 [-0.31 , 0.36]		
✔ Lillevoll, 2014[d]	0.13	0.14202	42	483	8.2%	0.13 [-0.15 , 0.41]		
✔ Liu 2024[a]	0.558287	0.280875	25	28	6.1%	0.56 [0.01 , 1.11]		
✔ Manicavasagar 2014[a]	0.085705	0.174708	53	86	7.7%	0.09 [-0.26 , 0.43]		
✔ Ohashi 2024[b]	-0.035231	0.272188	27	27	6.2%	-0.04 [-0.57 , 0.50]		
✔ Pavarini 2023[a]	-0.539836	0.203757	50	50	7.2%	-0.54 [-0.94 , -0.14]		
✔ Peuters 2024b[e]	0.32	10.918162	87	95	0.0%	0.32 [-21.08 , 21.72]		
✔ Skeen 2023[a]	0.02	0.178575	248	246	7.6%	0.02 [-0.33 , 0.37]		
✔ Waters 2023[f]	-0.333761	0.217233	43	43	7.0%	-0.33 [-0.76 , 0.09]		
✔ Waters 2024c[g]	-0.254562	0.3941	13	13	4.5%	-0.25 [-1.03 , 0.52]		
✔ Zhang 2023[h]	-0.527347	0.167911	75	72	7.8%	-0.53 [-0.86 , -0.20]		
✔ Zheng 2021[a]	-0.829408	0.067499	485	469	9.0%	-0.83 [-0.96 , -0.70]		
✔ Zulkefly 2024[a]	-0.47591	0.415105	12	12	4.3%	-0.48 [-1.29 , 0.34]		
Total (Wald[i])			**1471**	**1948**	**100.0%**	**-0.24 [-0.47 , -0.01]**		

Test for overall effect: Z = 2.06 (P = 0.04)
Test for subgroup differences: Not applicable
Heterogeneity: Tau² (DL[j]) = 0.15; Chi² = 89.02, df = 14 (P < 0.00001); I² = 84%

Footnotes
[a]Virtual - Between - Randomized
[b]Virtual - Within - Non-Randomized
[c]Virtual (iACT) - Between - Randomized
[d]Virtual - Betwen - Randomized - tailored e-mail reminder (but in end all measured) posttest
[e]Virtual - Between - Quasi-Randomized
[f]Hybrid - Within - Non-Randomized
[g]Virtual - Within - Non-Randomized; Remote Delivery only
[h]Hybrid - Between - Randomized
[i]CI calculated by Wald-type method.
[j]Tau² calculated by DerSimonian and Laird method.

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

Emotion – Hybrid – Follow-Up ≥ 1-month to ≤ 6-months

Study or Subgroup	SMD	SE	Experimental Total	Control Total	Weight	Std. mean difference IV, Random, 95% CI	Std. mean difference IV, Random, 95% CI	Risk of Bias A B C D E F G
✔ Calear 2009[a]	-0.15	0.4	473	800	2.0%	-0.15 [-0.93 , 0.63]		+ + + + + +
✔ Calear 2016[b]	0.072354	0.060245	427	778	12.6%	0.07 [-0.05 , 0.19]		+ + − − ? +
✔ DeSmet 2018[c]	-0.549021	0.139502	120	96	8.2%	-0.55 [-0.82 , -0.28]		+ + + + ? +
✔ Fridrici 2007[d]	-0.206328	0.129429	176	91	8.7%	-0.21 [-0.46 , 0.05]		+ + ? + + +
✔ Hadley 2019[e]	0.127815	0.213428	44	44	5.2%	0.13 [-0.29 , 0.55]		+ ? ? + + +
✔ Huag 2021[f]	-0.149355	0.052192	750	723	13.0%	-0.15 [-0.25 , -0.05]		+ + + + + +
✔ Lang 2009[g]	-0.38112	0.210483	46	46	5.3%	-0.38 [-0.79 , 0.03]		+ + − + + ?
✔ McRury 2010[h]	0.393538	0.397834	12	14	2.0%	0.39 [-0.39 , 1.17]		+ − − − − +
✔ Nagamitsu 2022[i]	-0.238751	0.172201	66	70	6.7%	-0.24 [-0.58 , 0.10]		+ + + + + +
✔ Perry 2017[j]	-0.161092	0.110256	140	201	9.8%	-0.16 [-0.38 , 0.06]		+ + ? + + +
✔ Schoneveld 2016[k]	-0.512625	0.124189	134	134	9.0%	-0.51 [-0.76 , -0.27]		+ + + + + +
✔ Sun 2022[l]	-0.13	0.088088	152	238	11.0%	-0.13 [-0.30 , 0.04]		+ + ? + ? +
✔ Waters 2019[m]	-0.296955	0.175291	96	50	6.6%	-0.30 [-0.64 , 0.05]		+ + ? ? ? +
Total (Wald[n])			**2636**	**3285**	**100.0%**	**-0.19 [-0.31 , -0.07]**		

Test for overall effect: Z = 3.18 (P = 0.001)
Test for subgroup differences: Not applicable
Heterogeneity: Tau² (DL°) = 0.03; Chi² = 36.18, df = 12 (P = 0.0003); I² = 67%

Favours [experimental]   Favours [control]

Footnotes
[a]Hybrid - Between - Randomized - posttest measured at 1-month
[b]Hybrid - Between - Randomized (E-GAD Arm) measured at 6-months posttest
[c]Hybrid - Between - Randomized; Posttest measured at 4-weeks (T2)
[d]Hyrbid - Between - Randomized; Follow-up at 2-months.
[e]Hybrid - Between - Randomized; Posttest measured at 3-month follow-up from intervention
[f]Hybrid - Between - Randomized; Posttest measured at 6-months after intervention
[g]Hybrid - Crossover-randomized from baseline to 3-month follow-up; since participants all received the intervention, we entered the total number of participants for both arms.
[h]Hybrid - Between - Randomized; Follow-up measured at 12-weeks.
[i]Hybrid - Between - Randomized; Follow-up at 4-months.
[j]Hybrid - Between - Randomized - 6-month follow-up
[k]Hybrid - Between - Randomized; pretest to 3-month follow-up.
[l]Hybrid - Between-Randomized; Follow-up at (T4) 3-months.
[m]Hybrid - Between - Randomized; Follow-up at 6-months.
[n]CI calculated by Wald-type method.
[o]Tau² calculated by DerSimonian and Laird method.

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
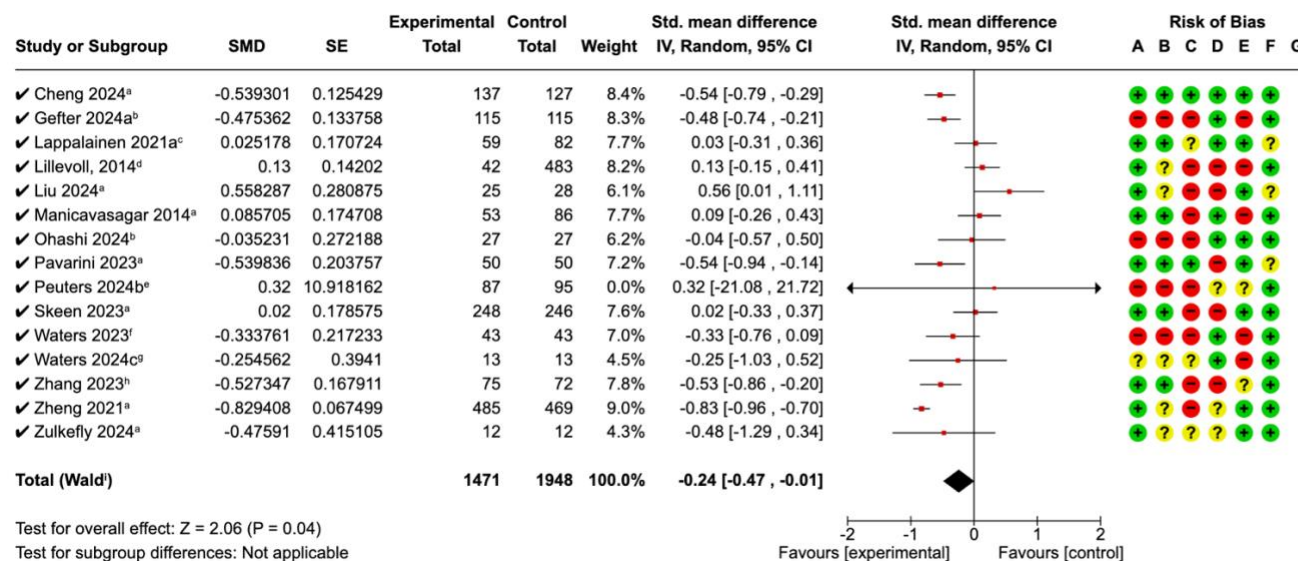(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

Emotion – Virtual – Follow-Up ≥ 1-month to ≤ 6-months

Study or Subgroup	SMD	SE	Experimental Total	Control Total	Weight	Std. mean difference IV, Random, 95% CI	Std. mean difference IV, Random, 95% CI	Risk of Bias A B C D E F G
✔ Bohr 2023[a]	-0.052703	0.360006	13	19	2.4%	-0.05 [-0.76 , 0.65]		+ ? − ? − +
✔ Sim 2020[b]	-0.108999	0.108229	171	171	26.5%	-0.11 [-0.32 , 0.10]		+ + + + ? +
✔ Subotic 2023[c]	-0.011695	0.072522	336	438	59.0%	-0.01 [-0.15 , 0.13]		− − − + ? ?
✔ Wong 2020[d]	-0.044969	0.172796	67	67	10.4%	-0.04 [-0.38 , 0.29]		− − − + ? +
✔ Zulkefly 2024[e]	-0.524738	0.416569	12	12	1.8%	-0.52 [-1.34 , 0.29]		+ ? ? ? + +
Total (Wald[f])			**599**	**707**	**100.0%**	**-0.05 [-0.16 , 0.06]**		

Test for overall effect: Z = 0.92 (P = 0.36)
Test for subgroup differences: Not applicable
Heterogeneity: Tau² (DL[g]) = 0.00; Chi² = 1.88, df = 4 (P = 0.76); I² = 0%

Footnotes
[a]Virtual - Between - Randomized; Postintervention at 7-weeks.
[b]Virtual - Between - Randomized; Postintervention measured at 3-months.
[c]Virtual - Within - Non-Randomized; Posttest measured at 1-2-months post intervention
[d]Virtual - Within - Non-Randomized; Posttest measured at 1-month.
[e]Virtual - Between - Randomized; Follow-up at 1-month.
[f]CI calculated by Wald-type method.
[g]Tau² calculated by DerSimonian and Laird method.

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
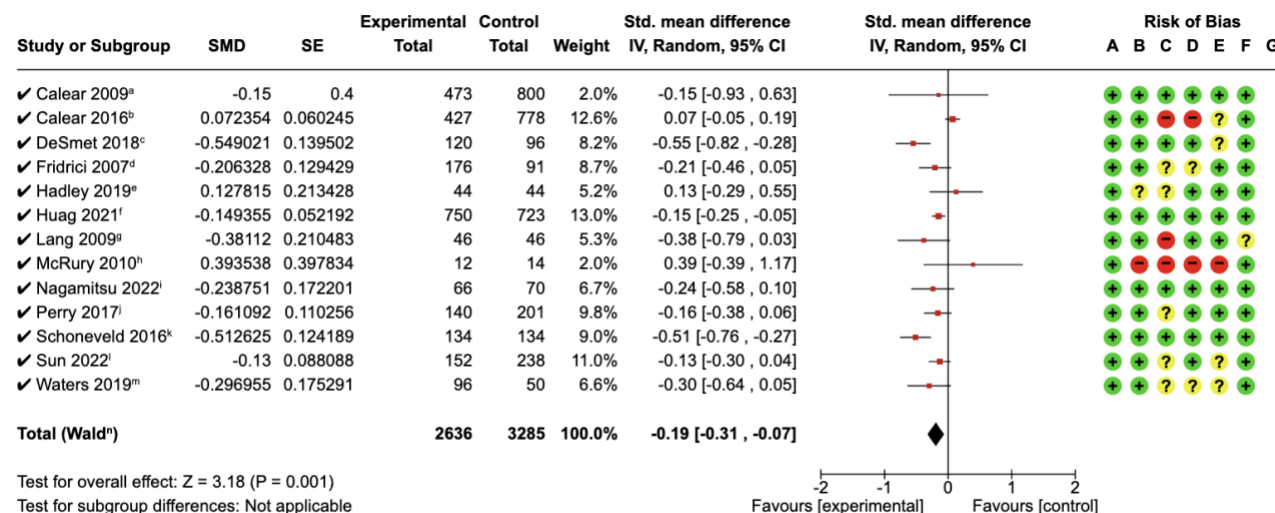(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

Behaviour – Hybrid – Post-Intervention (Immediate) < 1-month

Study or Subgroup	SMD	SE	Experimental Total	Control Total	Weight	Std. mean difference IV, Random, 95% CI
✔ Chillemi 2020[a]	-0.36	0.14286	54	54	19.3%	-0.36 [-0.64 , -0.08]
✔ Gefter 2024b[a]	-0.2	0.2	25	25	9.9%	-0.20 [-0.59 , 0.19]
✔ Lang 2009[b]	-0.25781	0.297337	25	21	4.5%	-0.26 [-0.84 , 0.32]
✔ Nagamitsu 2022[b]	-0.267266	0.16924	69	72	13.8%	-0.27 [-0.60 , 0.06]
✔ Nelson 2002[a]	0.042838	0.226483	39	39	7.7%	0.04 [-0.40 , 0.49]
✔ Pisani 2024[b]	0	0.134846	111	109	21.7%	0.00 [-0.26 , 0.26]
✔ Sousa 2020[c]	-0.135089	0.1598	53	151	15.5%	-0.14 [-0.45 , 0.18]
✔ Waters 2024a[d]	0.084987	0.226563	39	39	7.7%	0.08 [-0.36 , 0.53]
Total (Wald[e])			**415**	**510**	**100.0%**	**-0.15 [-0.27 , -0.03]**

Test for overall effect: Z = 2.37 (P = 0.02)
Test for subgroup differences: Not applicable
Heterogeneity: Tau² (DL[f]) = 0.00; Chi² = 5.88, df = 7 (P = 0.55); I² = 0%

Footnotes
[a]Hybrid - Within - Non-Randomized
[b]Hybrid - Between - Randomized
[c]Hybrid - Between - Non-Randomized
[d]Hybrid - Within - Non-Randomized; In-person + remote real time.
[e]CI calculated by Wald-type method.
[f]Tau² calculated by DerSimonian and Laird method.

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
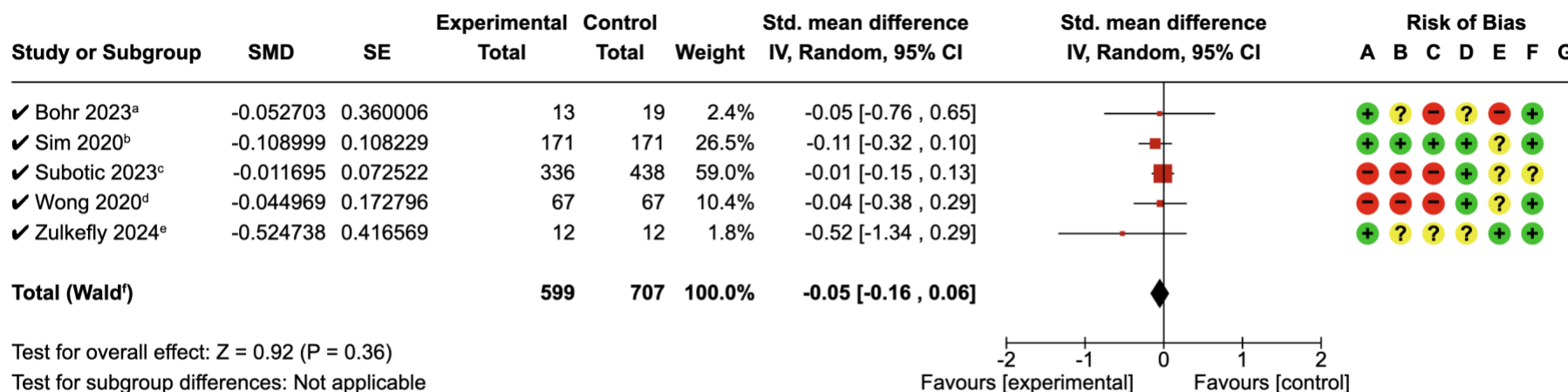(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

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Behaviour – Virtual – Post-Intervention (Immediate) < 1-month

Study or Subgroup	SMD	SE	Experimental Total	Control Total	Weight	Std. mean difference IV, Random, 95% CI	Std. mean difference IV, Random, 95% CI	Risk of Bias A B C D E F G
✔ Benzi 2023[a]	-0.824794	0.30175	24	24	8.0%	-0.82 [-1.42 , -0.23]		− − − − + −
✔ Gefter 2024a[a]	-0.435	0.108	115	115	15.8%	-0.43 [-0.65 , -0.22]		− − − + − +
✔ Morawska 2006[a]	-0.654607	0.165535	77	77	13.3%	-0.65 [-0.98 , -0.33]		− − − + − +
✔ Skeen 2023[b]	-0.03	0.21429	248	246	11.1%	-0.03 [-0.45 , 0.39]		+ + − − + +
✔ Subotic 2023[a]	0.017724	0.072221	341	438	17.2%	0.02 [-0.12 , 0.16]		− − − + ? ?
✔ Waters 2023[a]	-0.225993	0.216386	43	43	11.1%	-0.23 [-0.65 , 0.20]		− − − + − +
✔ Waters 2024c[c]	0.185203	0.393222	13	13	5.8%	0.19 [-0.59 , 0.96]		? ? ? + − +
✔ Wolchik 2022[b]	-0.172416	0.180174	81	50	12.6%	-0.17 [-0.53 , 0.18]		+ + + + + +
✔ Zulkefly 2024[b]	-0.707321	0.423246	12	12	5.2%	-0.71 [-1.54 , 0.12]		+ ? ? ? + +
Total (Wald[d])			**954**	**1018**	**100.0%**	**-0.29 [-0.52 , -0.07]**		

Test for overall effect: Z = 2.59 (P = 0.010)
Test for subgroup differences: Not applicable
Heterogeneity: Tau² (DL[e]) = 0.07; Chi² = 28.71, df = 8 (P = 0.0004); I² = 72%

Favours [experimental]   Favours [control]

Footnotes
[a]Virtual - Within - Non-Randomized
[b]Virtual - Between - Randomized
[c]Hybrid - Within - Non-Randomized; Remote delivery only.
[d]CI calculated by Wald-type method.
[e]Tau² calculated by DerSimonian and Laird method.

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

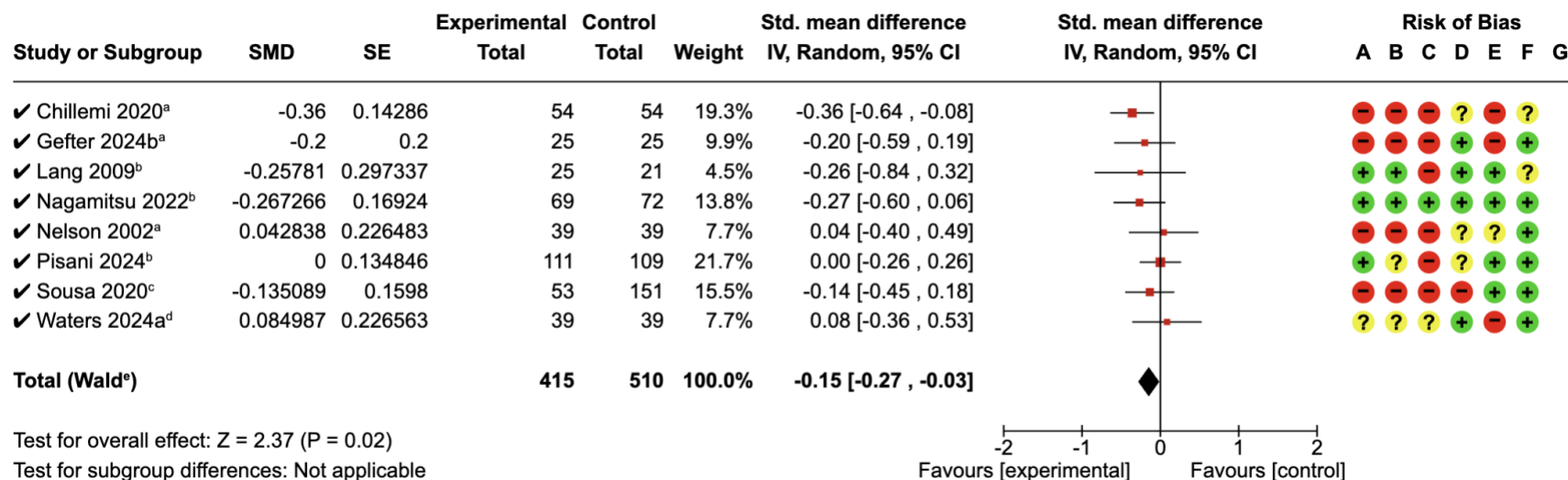**Behaviour – Hybrid – Follow-Up ≥ 1-month to ≤ 6-months**

Study or Subgroup	SMD	SE	Experimental Total	Control Total	Weight	Std. mean difference IV, Random, 95% CI	Std. mean difference IV, Random, 95% CI	Risk of Bias A B C D E F G
✔ Lang 2009[a]	-0.231959	0.209246	46	46	9.9%	-0.23 [-0.64 , 0.18]		+ + − + + ?
✔ Nagamitsu 2022[b]	-0.342803	0.172865	66	70	14.5%	-0.34 [-0.68 , -0.00]		+ + + + + +
✔ Pisani 2024[c]	-0.025036	0.134851	111	109	23.8%	-0.03 [-0.29 , 0.24]		+ ? − ? + +
✔ Sun 2022[d]	-0.15	0.091194	152	226	51.9%	-0.15 [-0.33 , 0.03]		+ + ? + ? +
Total (Wald[e])			**375**	**451**	**100.0%**	**-0.16 [-0.29 , -0.03]**		

Test for overall effect: Z = 2.38 (P = 0.02)
Test for subgroup differences: Not applicable
Heterogeneity: Tau² (DL[f]) = 0.00; Chi² = 2.25, df = 3 (P = 0.52); I² = 0%

Footnotes
[a]Hybrid - Crossover-randomized from baseline to 3-month follow-up; since participants all received the intervention, we entered the total number of participants for both arms.
[b]Hybrid - Between - Randomized; Follow-up at 4-months.
[c]Hybrid - Between - Randomized - follow-up at 3-months.
[d]Hybrid - Between - Randomized; Follow-up measured at T4 - 3-months
[e]CI calculated by Wald-type method.
[f]Tau² calculated by DerSimonian and Laird method.

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

Behaviour – Virtual – Follow-Up ≥ 1-month to ≤ 6-months

Study or Subgroup	SMD	SE	Experimental Total	Control Total	Weight	Std. mean difference IV, Random, 95% CI	Std. mean difference IV, Random, 95% CI	Risk of Bias A B C D E F G
✔ Benzi 2023[a]	-0.703132	0.301473	23	24	22.2%	-0.70 [-1.29 , -0.11]		● ● ● ● ● ●
✔ Morawska 2006[b]	-0.63169	0.1734	64	77	30.7%	-0.63 [-0.97 , -0.29]		● ● ● ● ● ●
✔ Wong 2020[c]	0.075046	0.172836	67	67	30.8%	0.08 [-0.26 , 0.41]		● ● ● ● ? ●
✔ Zulkefly 2024[d]	-0.463048	0.414742	12	12	16.3%	-0.46 [-1.28 , 0.35]		● ? ? ? ● ●
Total (Wald[e])			**166**	**180**	**100.0%**	**-0.40 [-0.84 , 0.03]**		

Test for overall effect: Z = 1.82 (P = 0.07)
Test for subgroup differences: Not applicable
Heterogeneity: Tau² (DL[f]) = 0.13; Chi² = 10.13, df = 3 (P = 0.02); I² = 70%

Favours [experimental]   Favours [control]

Footnotes
[a]Virtual - Within - Non-Randomized; T0-T2 (baseline to 2-month follow-up)
[b]Virtual - Within - Non-Randomized; pretest to follow-up measured at 3-months
[c]Virtual - Within - Non-Randomized; Posttest measured at 1-month.
[d]Virtual - Between - Randomized; Follow-up at 1-month.
[e]CI calculated by Wald-type method.
[f]Tau² calculated by DerSimonian and Laird method.

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
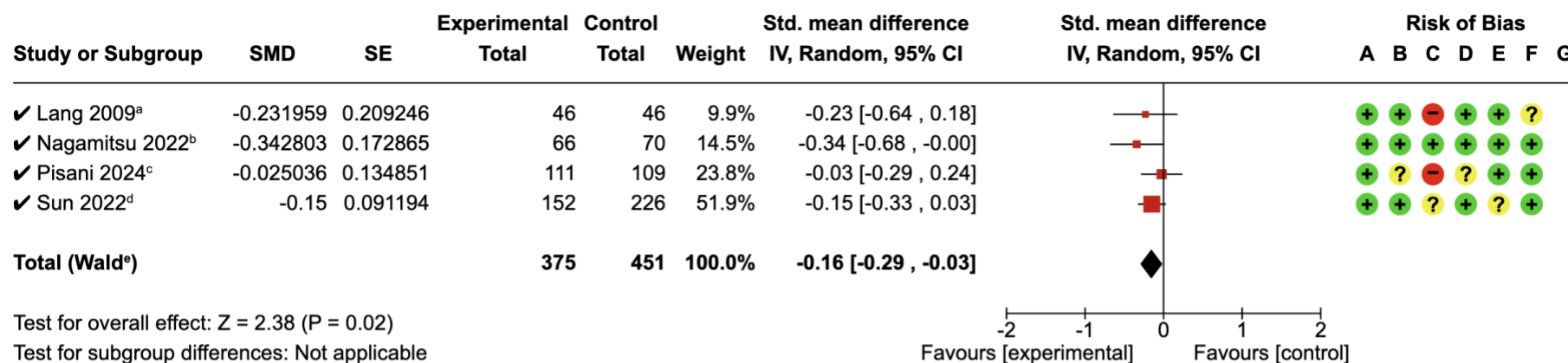(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

Social – Hybrid – Post-Intervention (Immediate) < 1-month

Study or Subgroup	SMD	SE	Experimental Total	Control Total	Weight	Std. mean difference IV, Random, 95% CI
✔ DeSmet 2018[a]	0.13383	0.137085	120	96	10.5%	0.13 [-0.13 , 0.40]
✔ Fridrici 2007[b]	-0.304639	0.129797	176	91	11.1%	-0.30 [-0.56 , -0.05]
✔ Kazemi 2022[b]	-0.562627	0.202064	51	51	6.4%	-0.56 [-0.96 , -0.17]
✔ Mesurado 2019[c]	-0.359276	0.199684	51	51	6.5%	-0.36 [-0.75 , 0.03]
✔ Mesurado 2022[b]	-0.180969	0.073988	421	325	17.1%	-0.18 [-0.33 , -0.04]
✔ Peuters 2024a[d]	-0.02	0.063777	155	95	18.3%	-0.02 [-0.15 , 0.11]
✔ Sousa 2020[e]	0.119552	0.159769	53	151	8.8%	0.12 [-0.19 , 0.43]
✔ Zagni 2024[b]	-0.22	0.035715	389	424	21.2%	-0.22 [-0.29 , -0.15]
Total (Wald[f])			**1416**	**1284**	**100.0%**	**-0.15 [-0.27 , -0.03]**

Test for overall effect: Z = 2.49 (P = 0.01)
Test for subgroup differences: Not applicable
Heterogeneity: Tau² (DL[g]) = 0.02; Chi² = 21.46, df = 7 (P = 0.003); I² = 67%

Footnotes
[a]Hyrbid - Between - Randomized
[b]Hybrid - Between - Randomized
[c]Hybrid - Within - Non-Randomized
[d]Hybrid (In-person) - Between - quasi-Randomized
[e]Hybrid - Between - Non-Randomized
[f]CI calculated by Wald-type method.
[g]Tau² calculated by DerSimonian and Laird method.

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
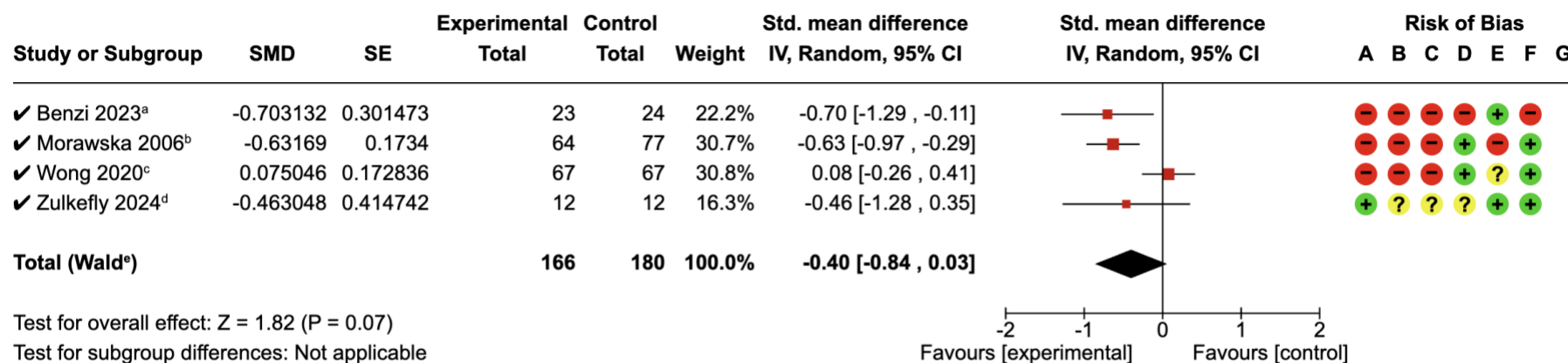(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

Social – Virtual – Post-Intervention (Immediate) < 1-month

Study or Subgroup	SMD	SE	Experimental Total	Control Total	Weight	Std. mean difference IV, Random, 95% CI
✔ Peuters 2024b[a]	0.48	0.068879	87	95	23.0%	0.48 [0.34 , 0.62]
✔ Skeen 2023[b]	-0.43	0.250005	248	246	17.6%	-0.43 [-0.92 , 0.06]
✔ Waters 2023[c]	-0.417889	0.218118	43	43	18.8%	-0.42 [-0.85 , 0.01]
✔ Wolchik 2022[b]	-0.00596	0.179849	81	50	20.1%	-0.01 [-0.36 , 0.35]
✔ Zhang 2023[b]	-0.115729	0.165133	75	72	20.5%	-0.12 [-0.44 , 0.21]
Total (Wald[d])			**534**	**506**	**100.0%**	**-0.07 [-0.48 , 0.34]**

Test for overall effect: Z = 0.33 (P = 0.74)
Test for subgroup differences: Not applicable
Heterogeneity: Tau² (DL[e]) = 0.19; Chi² = 34.84, df = 4 (P < 0.00001); I² = 89%

Footnotes
[a]Virtual (Remote due to pandemic) - Between - quasi-Randomized
[b]Virtual - Between - Randomized
[c]Virtual - Within - Non-Randomized
[d]CI calculated by Wald-type method.
[e]Tau² calculated by DerSimonian and Laird method.

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
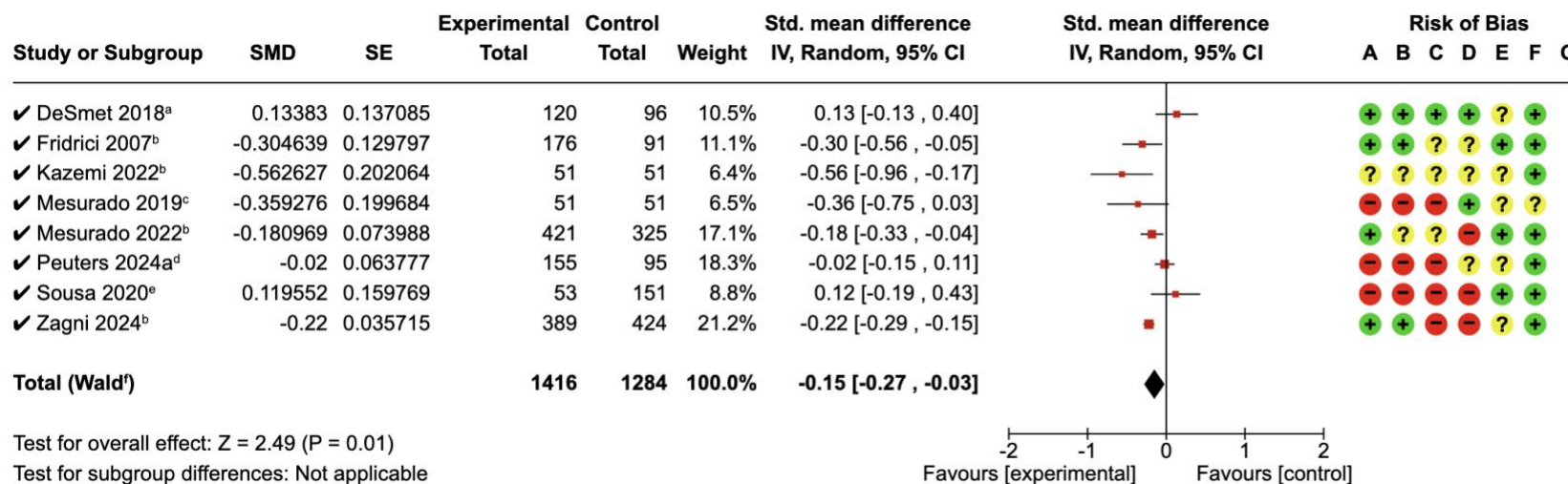(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

Social – Hybrid – Follow-Up ≥ 1-month to ≤ 6-months

Study or Subgroup	SMD	SE	Experimental Total	Control Total	Weight	Std. mean difference IV, Random, 95% CI
✔ DeSmet 2018[a]	-0.110004	0.137035	120	96	11.1%	-0.11 [-0.38 , 0.16]
✔ Fridrici 2007[b]	-0.228092	0.129498	176	91	12.4%	-0.23 [-0.48 , 0.03]
✔ Huag 2021[c]	-0.09299	0.052148	750	723	76.5%	-0.09 [-0.20 , 0.01]
Total (Wald[d])			**1046**	**910**	**100.0%**	**-0.11 [-0.20 , -0.02]**

Test for overall effect: Z = 2.45 (P = 0.01)
Test for subgroup differences: Not applicable
Heterogeneity: Tau² (DL[e]) = 0.00; Chi² = 0.94, df = 2 (P = 0.63); I² = 0%

Footnotes
[a]Hybrid - Between - Randomized; Posttest measured at 4-weeks (T2)
[b]Hybrid - Between - Randomized; Follow-up at 2-months.
[c]Hybrid - Between - Randomized; Posttest measured at 6-months.
[d]CI calculated by Wald-type method.
[e]Tau² calculated by DerSimonian and Laird method.

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
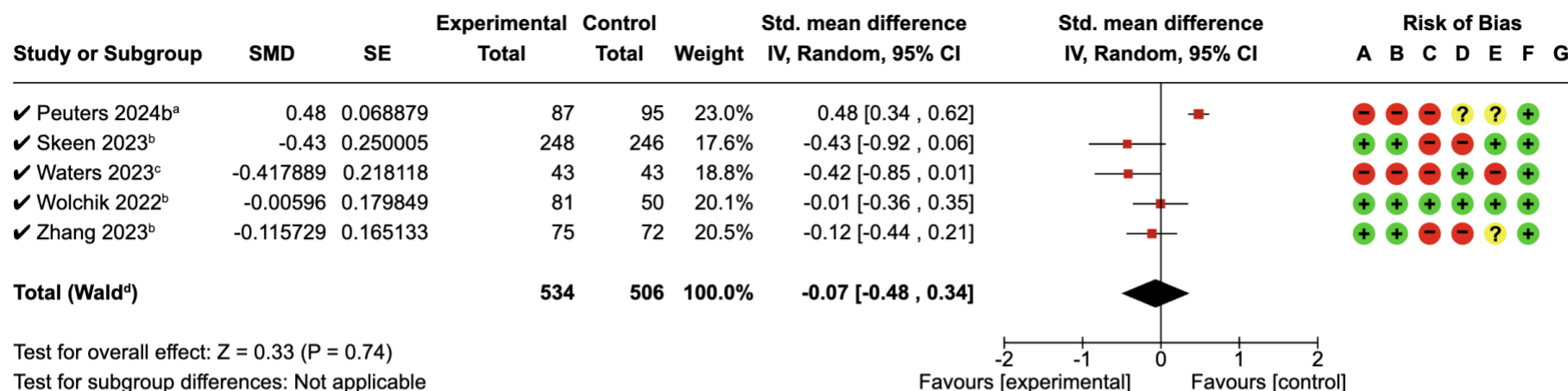(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

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Social – Virtual – Follow-Up ≥ 1-month to ≤ 6-months

Study or Subgroup	SMD	SE	Experimental Total	Control Total	Weight	Std. mean difference IV, Random, 95% CI	Std. mean difference IV, Random, 95% CI	Risk of Bias A B C D E F G
✔ DeGarmo 2019[a]	-0.076092	0.09709	225	201	39.2%	-0.08 [-0.27 , 0.11]		+ + + ? + ?
✔ Sim 2020[b]	-0.077245	0.108188	171	171	32.7%	-0.08 [-0.29 , 0.13]		+ + + + ? +
✔ Wong 2020[c]	-0.323701	0.173936	67	67	13.9%	-0.32 [-0.66 , 0.02]		− − − + ? +
✔ Zhang 2023[d]	0.123905	0.172345	69	66	14.2%	0.12 [-0.21 , 0.46]		+ + − − ? +
Total (Wald[e])			**532**	**505**	**100.0%**	**-0.08 [-0.21 , 0.05]**		

Test for overall effect: Z = 1.23 (P = 0.22)
Test for subgroup differences: Not applicable
Heterogeneity: Tau² (DL[f]) = 0.00; Chi² = 3.36, df = 3 (P = 0.34); I² = 11%

Footnotes
[a]Virtual - Between - Randomized; Posttest measured at 12-weeks (Time 3) follow-up. Posttest (Time 2) at 7-weeks not provided.
[b]Virtual - Between - Randomized; Posttest measured at 3-months.
[c]Virtual - Within - Non-Randomized; Follow-up from baseline to 6-months.
[d]Virtual - Between - Randomized; Follow-up at 6-months.
[e]CI calculated by Wald-type method.
[f]Tau² calculated by DerSimonian and Laird method.

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
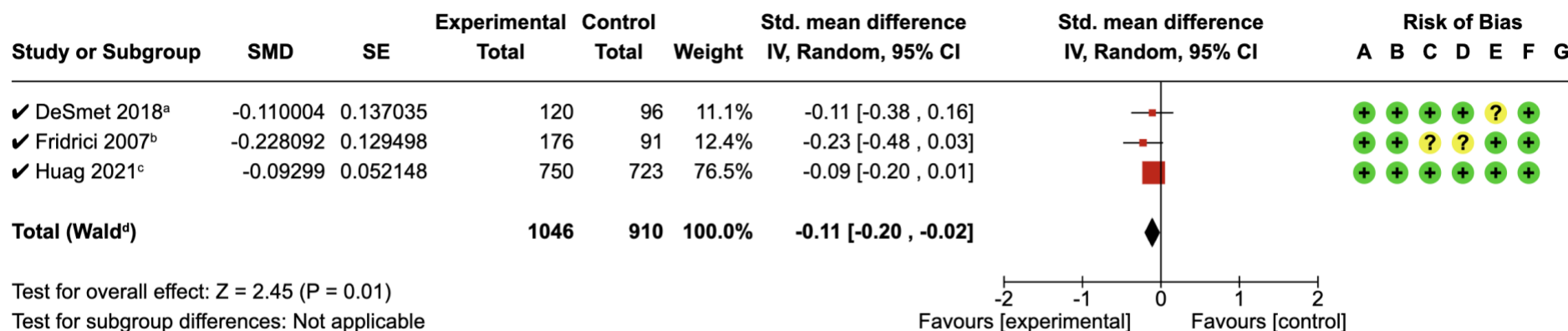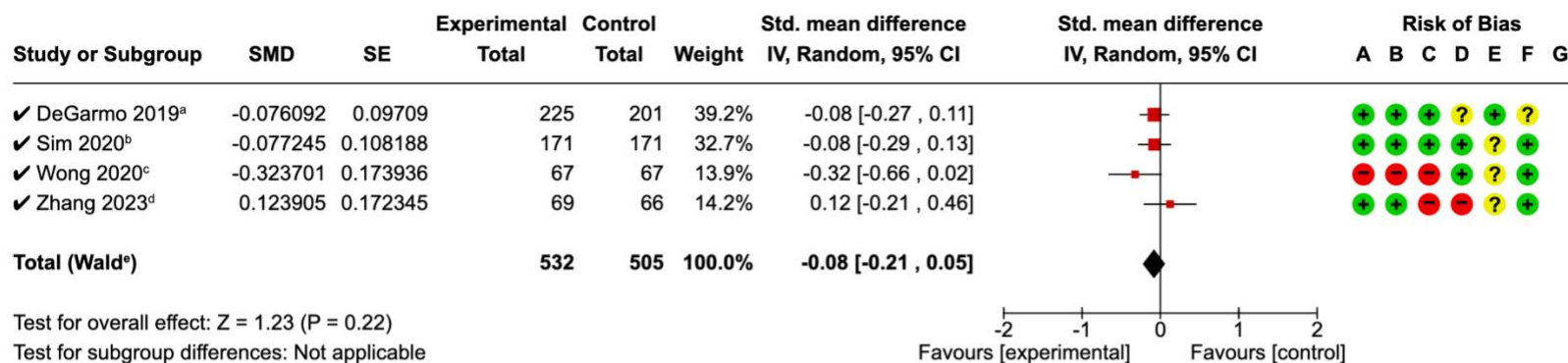(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

Cognitive – Hybrid – Post-Intervention (Immediate) < 1-month

Study or Subgroup	SMD	SE	Experimental Total	Control Total	Weight	Std. mean difference IV, Random, 95% CI
✔ Chillemi 2020[a]	-0.37	0.14286	54	54	11.8%	-0.37 [-0.65 , -0.09]
✔ Fridrici 2007[b]	-0.404169	0.130312	176	91	12.6%	-0.40 [-0.66 , -0.15]
✔ Gefter 2024b[a]	-0.088733	0.282994	25	25	5.8%	-0.09 [-0.64 , 0.47]
✔ Ko 2023[c]	0.212038	0.258974	30	30	6.5%	0.21 [-0.30 , 0.72]
✔ Lappalainen 2021b[d]	0.083091	0.166866	64	82	10.5%	0.08 [-0.24 , 0.41]
✔ Neal-Barnett 2019[a]	-0.332332	0.167845	72	72	10.4%	-0.33 [-0.66 , -0.00]
✔ Perry 2017[e]	0.006654	0.099269	206	200	14.5%	0.01 [-0.19 , 0.20]
✔ Waters 2019[c]	0.524023	0.173661	100	52	10.1%	0.52 [0.18 , 0.86]
✔ Zagni 2024[c]	-0.16	0.035715	389	424	17.7%	-0.16 [-0.23 , -0.09]
Total (Wald[f])			**1116**	**1030**	**100.0%**	**-0.09 [-0.25 , 0.08]**

Test for overall effect: Z = 1.05 (P = 0.30)
Test for subgroup differences: Not applicable
Heterogeneity: Tau² (DL[g]) = 0.04; Chi² = 28.80, df = 8 (P = 0.0003); I² = 72%

Footnotes
[a]Hybrid - Within - Non-Randomized
[b]Hyrbid - Between - Randomized
[c]Hybrid - Between - Randomized
[d]Hybrid (iACTface) - Between - Randomized
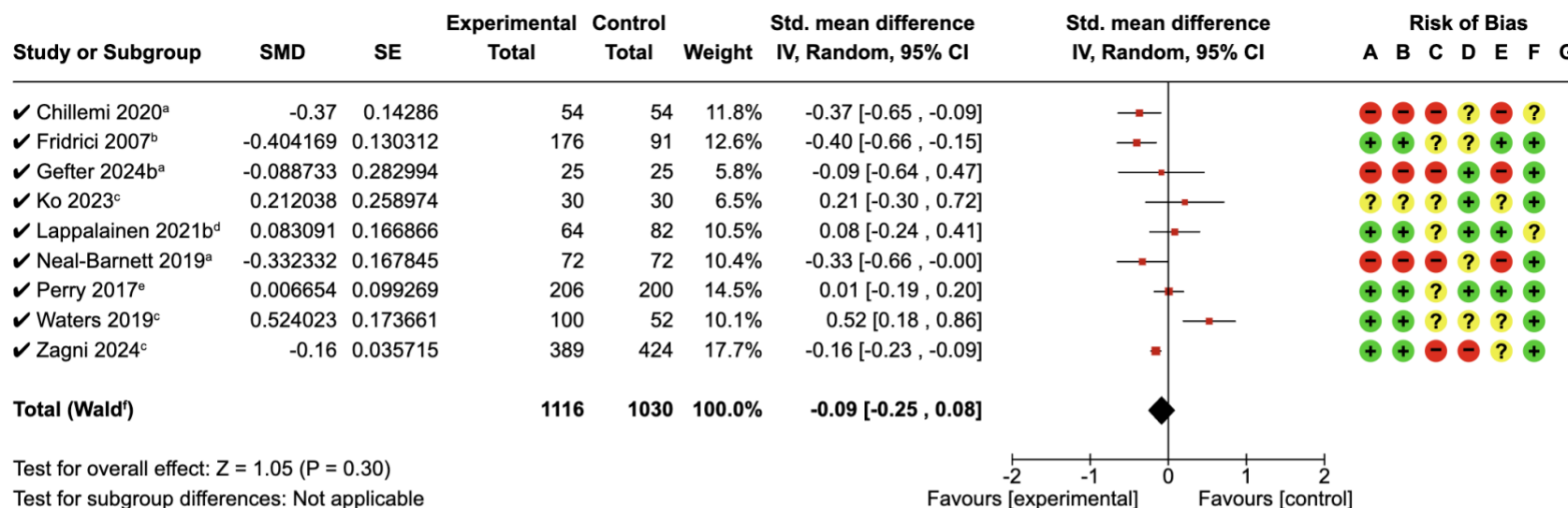[e]Hybrid - Between - Randomized - Posttest
[f]CI calculated by Wald-type method.
[g]Tau² calculated by DerSimonian and Laird method.

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

Cognitive – Virtual – Post-Intervention (Immediate) < 1-month

Study or Subgroup	SMD	SE	Experimental Total	Control Total	Weight	Std. mean difference IV, Random, 95% CI
✔ Cheng 2024[a]	-0.447196	0.124731	137	127	16.7%	-0.45 [-0.69 , -0.20]
✔ Gefter 2024a[b]	-0.632703	0.135191	115	115	16.3%	-0.63 [-0.90 , -0.37]
✔ Lappalainen 2021a[c]	0.121722	0.170875	59	82	14.9%	0.12 [-0.21 , 0.46]
✔ Liu 2024[a]	-0.938995	0.291033	25	28	10.5%	-0.94 [-1.51 , -0.37]
✔ Skeen 2023[a]	0.175	0.216841	248	246	13.2%	0.17 [-0.25 , 0.60]
✔ Waters 2023[b]	0.088911	0.215777	43	43	13.2%	0.09 [-0.33 , 0.51]
✔ Zhang 2023[a]	-0.197439	0.165404	75	72	15.2%	-0.20 [-0.52 , 0.13]
Total (Wald[d])			**702**	**713**	**100.0%**	**-0.25 [-0.53 , 0.02]**

Test for overall effect: Z = 1.80 (P = 0.07)
Test for subgroup differences: Not applicable
Heterogeneity: Tau² (DL[e]) = 0.10; Chi² = 26.78, df = 6 (P = 0.0002); I² = 78%

Footnotes
[a]Virtual - Between - Randomized
[b]Virtual - Within - Non-Randomized
[c]Virtual (iACT) - Between - Randomized
[d]CI calculated by Wald-type method.
[e]Tau² calculated by DerSimonian and Laird method.

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
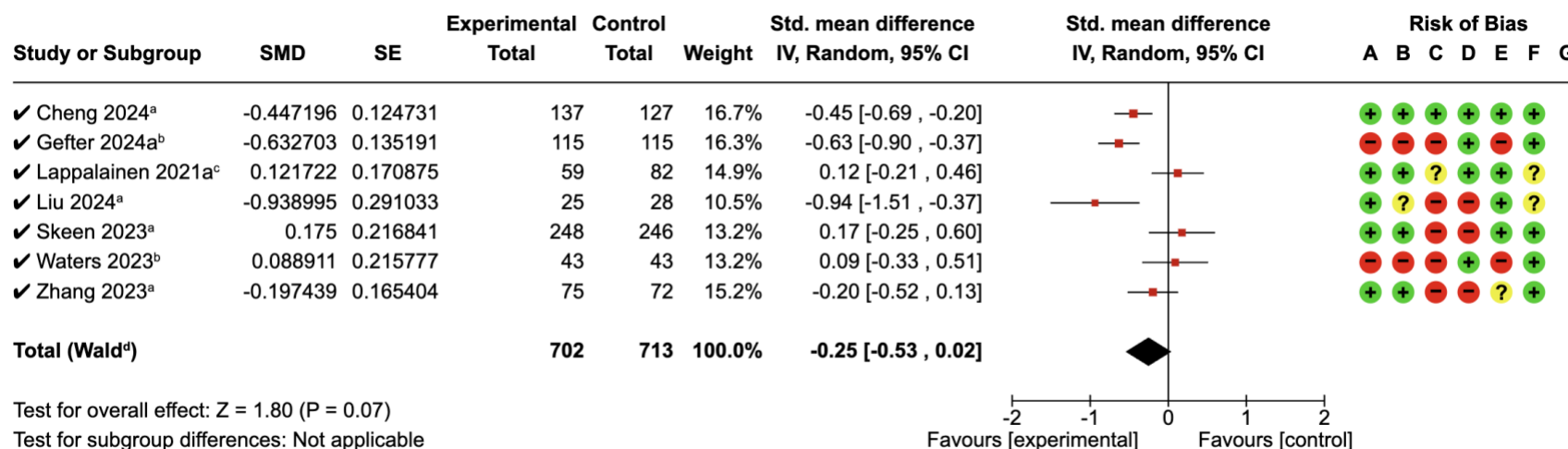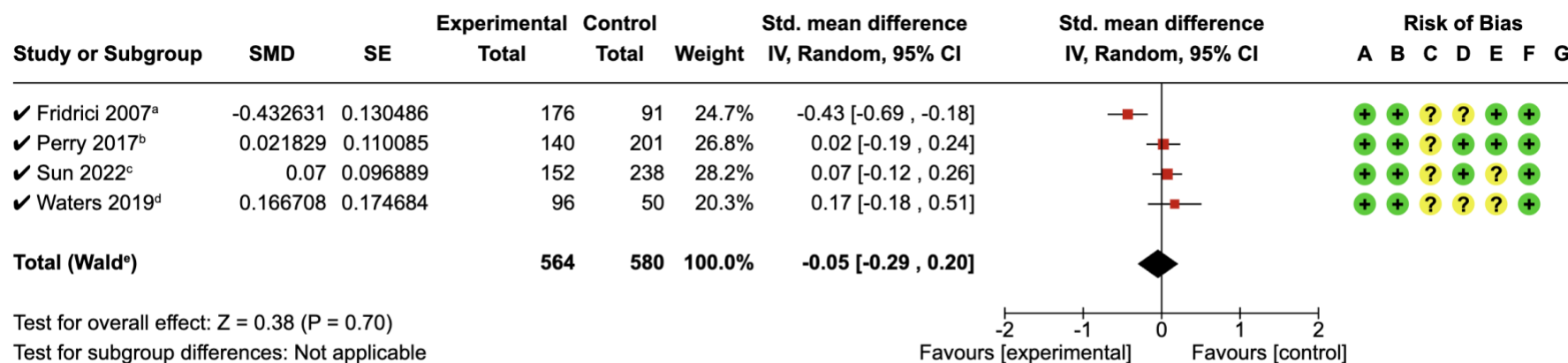(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

Cognitive – Hybrid – Follow-Up ≥ 1-month to ≤ 6-months

Study or Subgroup	SMD	SE	Experimental Total	Control Total	Weight	Std. mean difference IV, Random, 95% CI	Std. mean difference IV, Random, 95% CI	Risk of Bias A B C D E F G
✔ Fridrici 2007[a]	-0.432631	0.130486	176	91	24.7%	-0.43 [-0.69 , -0.18]		+ + ? ? + +
✔ Perry 2017[b]	0.021829	0.110085	140	201	26.8%	0.02 [-0.19 , 0.24]		+ + ? + + +
✔ Sun 2022[c]	0.07	0.096889	152	238	28.2%	0.07 [-0.12 , 0.26]		+ + ? + ? +
✔ Waters 2019[d]	0.166708	0.174684	96	50	20.3%	0.17 [-0.18 , 0.51]		+ + ? ? ? +
Total (Wald[e])			**564**	**580**	**100.0%**	**-0.05 [-0.29 , 0.20]**		

Test for overall effect: Z = 0.38 (P = 0.70)
Test for subgroup differences: Not applicable
Heterogeneity: Tau² (DL[f]) = 0.05; Chi² = 12.06, df = 3 (P = 0.007); I² = 75%

Favours [experimental]   Favours [control]

Footnotes
[a]Hybrid - Between - Randomized; Follow-up at 2-months.
[b]Hybrid - Between - Randomized - 6-month follow-up
[c]Hybrid - Between - Randomized; Follow-up measured at T4, 3-months.
[d]Hybrid - Between - Randomized; Follow-up at 6-months.
[e]CI calculated by Wald-type method.
[f]Tau² calculated by DerSimonian and Laird method.

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
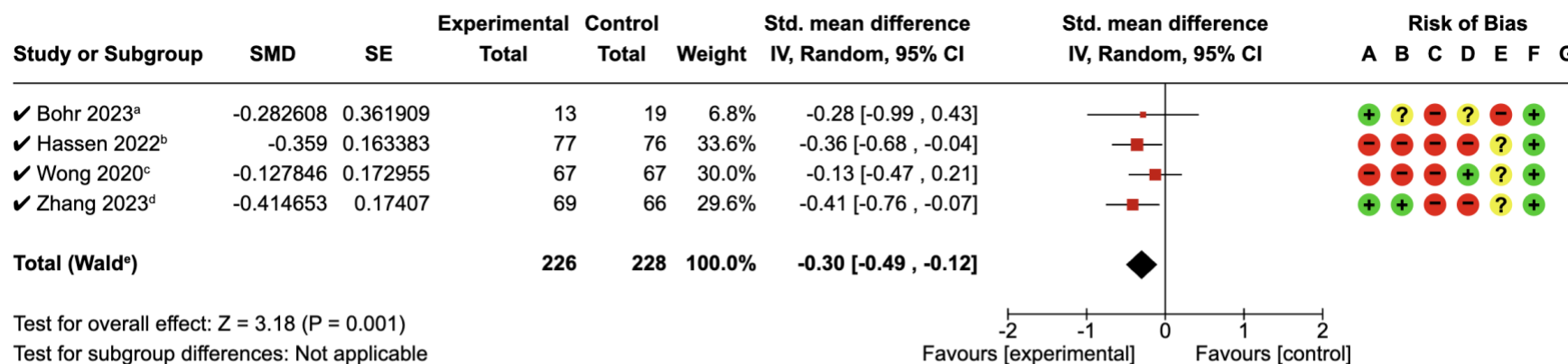(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

Cognitive – Virtual – Follow-Up ≥ 1-month to ≤ 6-months

Study or Subgroup	SMD	SE	Experimental Total	Control Total	Weight	Std. mean difference IV, Random, 95% CI	Std. mean difference IV, Random, 95% CI	Risk of Bias A B C D E F G
✔ Bohr 2023[a]	-0.282608	0.361909	13	19	6.8%	-0.28 [-0.99 , 0.43]		+ ? − ? − +
✔ Hassen 2022[b]	-0.359	0.163383	77	76	33.6%	-0.36 [-0.68 , -0.04]		− − − − ? +
✔ Wong 2020[c]	-0.127846	0.172955	67	67	30.0%	-0.13 [-0.47 , 0.21]		− − − + ? +
✔ Zhang 2023[d]	-0.414653	0.17407	69	66	29.6%	-0.41 [-0.76 , -0.07]		+ + − − ? +
Total (Wald[e])			**226**	**228**	**100.0%**	**-0.30 [-0.49 , -0.12]**		

Test for overall effect: Z = 3.18 (P = 0.001)
Test for subgroup differences: Not applicable
Heterogeneity: Tau² (DL[f]) = 0.00; Chi² = 1.56, df = 3 (P = 0.67); I² = 0%

-2 -1 0 1 2
Favours [experimental]   Favours [control]

Footnotes
[a]Virtual - Between-Randomized; Posttest measured at 7 weeks.
[b]Virtual - Between-Non-Randomized; Posttest measured at 7 weeks.
[c]Virtual - Within - Non-Randomized; Posttest measured at 1-month.
[d]Virtual - Between - Randomized; Follow-up at 6-months.
[e]CI calculated by Wald-type method.
[f]Tau² calculated by DerSimonian and Laird method.

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias