

**DS1** Search strategy of the review

1. (behavio\$ adj activati\$).ti,ab.
2. (activity adj scheduling).ti,ab.
3. (pleasant event\$ or pleasant activit\$ or daily diar\$).ti,ab.
4. (behavio\$ adj therap\$).ti,ab.
5. exp behavior therapy/
6. 1 or 2 or 3 or 4 or 5
7. exp Aged/
8. Elder\*.mp.
9. Geriatri\*.mp.
10. Senil\*.mp.
11. Older.mp.
12. Old Age.mp.
13. Late Life.mp.
14. Aged, 80-And-Over.mp.
15. 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14
16. randomized controlled trial.pt.
17. controlled clinical trial.pt.
18. randomized.ab.
19. randomised controlled trial.tw.
20. random\*.ab.
21. randomly.ab.
22. trial.ab.
23. groups.ab.
24. 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23
25. 6 and 15 and 24

**Table DS1** Characteristics of included studies

Study	Sample	Method	Measures	Intervention	Outcome Data Timepoints
BA in older people living in the community (with depressive symptoms or a diagnosis of depression) vs TAU or other psychological intervention (one study only)					
Gallagher & Thompson 1982	n = 30 <u>Inclusion criteria</u> 1) aged $\leq 55$ 2) MMSE $\leq 25$ 3) BDI $< 17$ /HRSD $< 17$	RCT <u>Control group</u> Brief relational insight therapy	<u>Primary outcome</u> HAM-D	<i>Intervention</i> BA (referred to as behaviour therapy) – Increasing pleasant events daily, monitoring of mood, relaxation & social skills training <i>Duration</i> 16 individual sessions over 12 weeks (90 mins)	Outcome data included in the Review  3 months
Thompson & Gallagher 1984	n = 43 <u>Inclusion criteria</u> 1) aged $\leq 60$ 2) MDD (RDC) 6) MMSE $\leq 25$	RCT <u>Control group</u> Delayed treatment control	<u>Primary outcome</u> HAM-D	<i>Intervention</i> BA (referred to as behaviour therapy) – Increasing pleasant events daily, monitoring of mood, relaxation & social skills training <i>Duration</i> 16-20 individual sessions over 6 weeks	Outcome data included in the Review  6 weeks
Scogin 1989	n = 40 <u>Inclusion criteria</u> 1) HRSD $\leq 10$ 2) MSQ $\leq 8$	RCT <u>Control group</u> Delayed treatment control	<u>Primary outcome</u> HRSD	<i>Intervention</i> BA bibliotherapy (Control Your Depression – Lewinsohn et al), pleasant activity scheduling, learning to relax, social skills, modification of self-defeating thoughts <i>Duration</i> Several ‘chapters’ over 4 weeks	Outcome data included in the Review  4 weeks
Moss et al 2012	n = 26 <u>Inclusion criteria</u> 1) aged $\leq 55$ 2) GDS $\leq 5$ 3) TICS-M $\leq 33$	RCT <u>Control group</u> Delayed treatment control	<u>Primary outcome</u> HRSD	<i>Intervention</i> BA bibliotherapy (Addis & Martell’s Overcoming depression one step at a time), pleasant activity scheduling and mood monitoring <i>Duration</i> Self-paced course over 4 weeks	Outcome data included in the Review  4 weeks
Cernin 2009	n = 15 <u>Inclusion criteria</u> Older adults living in assisted living housing	RCT <u>Control group</u> Waiting list	<u>Primary outcome</u> GDS	<i>Intervention</i> Pleasant activities scheduling, monitoring of mood, controlled breathing, visual imagery (Lichtenberg et al.) <i>Duration</i> 36 sessions over 12 weeks (lasting 30 minutes)	Outcome data included in the Review  3 months

Multicomponent BA for older people in the community

Ciechanowski 2004	n = 138 (mostly homebound & medically ill) <u>Inclusion criteria</u> 1) aged $\leq$ 55 2) DSM-IV minor depression or dysthymia	RCT <u>Control group</u> TAU	<u>Primary outcome</u> HSCL-20	<i>Intervention</i> PEARLS (Program to Encourage Active, Rewarding Lives for Seniors), medication review, increasing pleasant activities, monitoring of mood, PST, increasing physical and social activity <i>Duration</i> 8 sessions over 19 weeks on average (of 50 minutes)	Outcome data included in the Review 6 & 12 months
Unützer 2002	n = 1801 <u>Inclusion criteria</u> 1) aged $\leq$ 60 2) SCID major depression and/or dysthymia	RCT <u>Control group</u> TAU	<u>Primary outcome</u> SCL-20	<i>Intervention</i> IMPACT (Improving Mood-Promoting Access to Collaborative Care Treatment), care management, biopsychosial history, pleasant activity scheduling, medication review and/or PST <i>Duration</i> Weekly contact for an average of 6-8 weeks	Outcome data included in the Review 3 & 12 months
Gitlin et al. 2013	n = 208 (African Americans) <u>Inclusion criteria</u> 1) aged $\leq$ 55 2) PHQ-9 $\leq$ 5 3) MMSE $\leq$ 24	RCT <u>Control group</u> Wait-list control	<u>Primary outcome</u> <i>Depression severity</i> PHQ-9	<i>Intervention</i> BTB (Beat the Blues) incorporating care management, pleasant activity goals, mood monitoring, addressing environmental barriers, stress reduction <i>Duration</i> 10 in home sessions (1 hour) weekly	Outcome data included in the Review 4 & 8 months
Gilbody et al. 2017	n = 705 <u>Inclusion criteria</u> 1) aged $\leq$ 65 2) DSM-IV subthreshold depression (MINI)	RCT <u>Control group</u> Usual primary care	<u>Primary outcome</u> <i>Depression severity</i> PHQ-9	<i>Intervention</i> CASPER (Collaborative Care for Screen Positive Elders) incorporating care management, pleasant activity scheduling, monitoring of mood and rewarding activities, addressing avoidance of social interactions <i>Duration</i> 6 sessions (1 face to face and subsequent sessions by phone) weekly	Outcome data included in the Review 4 & 12 months
BA in older people in inpatient settings					
Sood 2003	n =14 (inpatients of rehabilitation unit) <u>Inclusion criteria</u> 1) aged $\leq$ 60	RCT <u>Control group</u> Standard occupational therapy	<u>Primary outcome</u> <i>Depression</i> GDS	<i>Intervention</i> GWP (Geriatric Welleness Program), increasing pleasurable activities, mood monitoring, relaxation/ stress reduction (controlled breathing, visualisation exercises) <i>Duration</i>	Outcome data included in the Review Post intervention (no further details provided)

Norton 2010	n = 50 (inpatients of psychiatric hospital) <u>Inclusion criteria</u> 1) aged $\leq 65$ 2) GDS $\leq 9$ /TICS-m $\leq 20$	RCT <u>Control group</u> Treatment as usual	<u>Primary outcome</u> <i>Depression</i> GDS	4 sessions weekly (30-60 minutes) over 7.5 weeks <i>Intervention</i> BATD (Brief Behavioral Activation Therapy), monitoring of pleasant activities and mood, identifying life areas of improvement <i>Duration</i> 8 group sessions over 2 weeks	Outcome data included in the Review  Post intervention (no further details provided)
Snarksi 2011	n = 50 (inpatients with mild/moderate cognitive impairment) <u>Inclusion criteria</u> 1) aged $\leq 65$ 2) GDS-S $\leq 3$ 3) MMSE $\leq 18$	RCT <u>Control group</u> Treatment as usual	<u>Primary outcome</u> <i>Depression</i> GDS-S	<i>Intervention</i> Increasing frequency and duration of activities in line with life goals, mood monitoring, setting goal hierarchies <i>Duration</i> 8 sessions, biweekly (30-60 minutes) over 4 weeks	Outcome data included in the Review  4 weeks
BA for older people living in care					
Lichtenberg 2005	n = 20 older people with AD or other dementia diagnosis <u>Inclusion criteria</u> Not specified	RCT <u>Control group</u> TAU	<u>Primary outcome</u> <i>Depression</i> GDS	<i>Intervention</i> Increasing pleasant activities, mood monitoring, breathing relaxation/imagery exercises <i>Duration</i> 3 times a week (20-30 minutes sessions) over 3 months	Outcome data included in the Review  3 months
Meeks et al 2008	n = 20 <u>Inclusion criteria</u> 1) SADS & DSM-IV major depressive disorder/minor depression/intermittent depressive disorder 2) GDS $\leq 11$ 3) MMSE $< 13$	RCT <u>Control group</u> TAU	<u>Primary outcome</u> <i>Depression</i> HDRS	<i>Intervention</i> BE-ACTIV (Behavioral Activities-based intervention), scheduling and increasing pleasant events, goal re-evaluation, confronting obstacles, maintaining gains <i>Duration</i> 10 individual 30-40 minutes sessions weekly over 10 weeks	Outcome data included in the Review  6 weeks
Hyer et al., 2009	n = 25 <u>Inclusion criteria</u> 1) DSM-IV depression diagnosis 2) GDS-S $\leq 5$ 3) MMSE $\leq 18$	RCT <u>Control group</u> Treatment as usual	<u>Primary outcome</u> <i>Depression</i> GDS-S	<i>Intervention</i> GIST (Group, Individual and Staff Therapy), increasing positive mood through pleasant activities, goal setting, & social support <i>Duration</i> 13 group & 2 individual sessions (75 to 90 minutes) weekly over 13 weeks	Outcome data included in the Review  Post intervention (approximately at 13 weeks)
Dozeman 2011	n = 129	RCT	<u>Primary outcome</u>	<i>Intervention</i>	Outcome data included in the

	<u>Inclusion criteria</u> 1) CES-D $\leq$ 8	<u>Control group</u> Usual care (regular activities in the home)	<i>Depression</i> CES-D	Self-help BA (Activity Scheduling of the Coping with Depression – CWD course - Haringsma et al 2006), pleasurable activity scheduling and monitoring of mood <i>Duration</i> Self-paced over 4 weeks	Review 3 months
Verkaik 2011	n = 97 older people with dementia <u>Inclusion criteria</u> 1) dementia diagnosis 2) PDC-dAD depression 3) verbal communication	RCT <u>Control group</u> TAU	<u>Primary outcome</u> <i>Depression</i> CSDD	<i>Intervention</i> Increasing pleasant activities, decreasing unpleasant events and maintain activities in every day life <i>Duration</i> Several sessions mostly training of nurses over 11 weeks (no further details provided)	Outcome data included in the Review 12 weeks
Meeks et al., 2015	n = 82 <u>Inclusion criteria</u> 1) aged $\leq$ 55 2) DSM-IV depressive disorder or GDS $\leq$ 11	Cluster RCT <u>Control group</u> TAU (staff training in dementia/managing behaviour problems)	<u>Primary outcome</u> <i>Depression</i> GDS	<i>Intervention</i> BE-ACTIV (Behavioral Activities Intervention), reinforcing pleasant activities, depression management, confronting obstacles <i>Duration</i> Weekly individual sessions over 10 weeks	Outcome data included in the Review 12 weeks
BA-related interventions in people with dementia living in the community (encouraged activities not in line with BA model and associated behavioral strategies)					
Teri 1997	n = 72 <u>Inclusion criteria</u> 1) dementia diagnosis 2) DSM-III-R/RDC major/minor depressive disorder	RCT <u>Control group</u> TAU	<u>Primary outcome</u> <i>Depression</i> CSDD & HRDS	<i>Intervention</i> BT-PE (Behavior Therapy-Pleasant Events), teaching carers behavioural strategies to address problem behaviors including depression, increasing pleasant events, problem-solving, addressing carer stress and burden <i>Duration</i> 9 (60 minutes) sessions over 9 weeks	Outcome data Post intervention 9 weeks
Teri 2003	n = 153 <u>Inclusion criteria</u> 1) NINDS-ADRDA criteria 2) family carer 2) living in the community	RCT <u>Control group</u> TAU (routine medical care)	<u>Primary outcome</u> <i>Depression</i> CSDD & HRDS	<i>Intervention</i> RDAD (Reducing Disability in Alzheimer's disease), increasing pleasant events, and modifying problem behaviours, increasing exercise, carer psychoeducation <i>Duration</i> 12 (1 hour) sessions over 3 months	Outcome data 3 months
Gitlin 2010	n = 209 <u>Inclusion criteria</u> 1) dementia diagnosis or	RCT <u>Control group</u> Education	<u>Primary outcome</u> <i>Function</i> FIM	<i>Intervention</i> COPE (Care of Persons with Dementia in their Environments), reducing environmental stressors,	Outcome data 4 months

MMSE < 24  
2) required assistance with  
daily activities/behaviour  
symptoms

materials

identifying deficits and capabilities, engaging  
patients in activities based on strengths and interests

*Duration*

10 sessions over 4 months

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*Note:* MMSE - Mini-Mental State Examination; BDI-II - Beck Depression Inventory-II; HAM-D/HRSD/HDRS - Hamilton Rating Scale for Depression; MDD - Major Depressive Disorder; RDC - Research Diagnostic Criteria; MSQ - Mental Status Questionnaire; GDS – Geriatric Depression Scale; TICS-M - Modified Telephone Interview for Cognitive Status; DSM-IV - Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition; HSCL-20 - Hopkins Symptom Checklist Depression Scale; SCID-5 - Structured Clinical Interview for DSM-5; SCL-20 - Symptom Checklist Depression Scale; PHQ-9 - Patient Health Questionnaire; MINI – Mini International Neuropsychiatric Interview; GDS-S - Geriatrics Depression Scale Short-Form; SADS - Schedule for Affective Disorders and Schizophrenia; CES-D - Center for Epidemiological Studies-Depression; PDC-dAD - Provisional Diagnostic Criteria for Depression of Alzheimer disease; CSDD – Cornell Scale for Depression in Dementia; DSM-III-R - Diagnostic & Statistical Manual of Mental Disorders–3rd Edition Revised; NINCDS-ADRDA - National Institute of Neurological and Communicative Disorders and Stroke and the Alzheimer's Disease and Related Disorders Association; FIM – Functional Independence Measure.

**Table DS2** Excluded studies

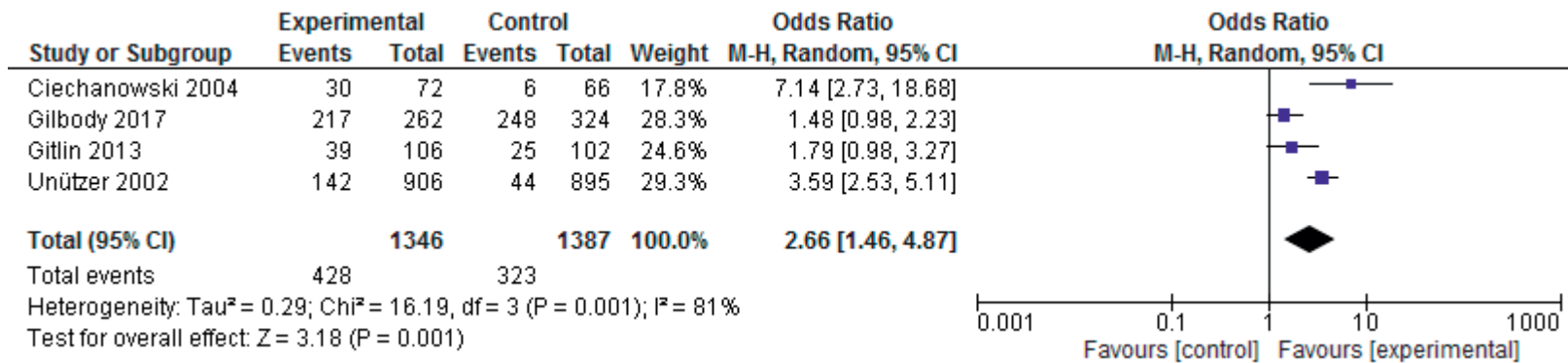
Study	Reason for Exclusion
1 Steffen 2016	RCT of a behavioural intervention incorporating BA, relaxation and management of behaviour problems in dementia in carers of people with neurocognitive disorder
2 Egede 2015	Randomised controlled open-label, non-inferiority trial, of telemedicine-delivered vs face to face BA in veterans
3 Alexopoulos 2015	Not a RCT (open treatment trial), Problem Solving Therapy (PST) in older adults with major depression compared with historical comparison group
4 Kiosses 2015	RCT of Problem adaptation therapy vs supportive therapy in older adults with cognitive impairment
5 Choi 2014	RCT of tele-PST vs in person PST vs telephone support calls in depressed low income homebound older adults
6 Moore 2013	RCT of BA vs information support in family carers of people with dementia
7 Acierno 2012	Controlled before-and-after study of BA and therapeutic exposure for bereavement in older adults with MDD and PTSD
8 Losada 2011	RCT of BA and cognitive restructuring in carers of people with dementia
9 van't Veer-Tazelaar 2015	RCT of minimally supported self-help CBT, problem-solving treatment, and referral to a primary care physician for medication for older people with subthreshold depression or anxiety
10 Alexopoulos 2011	PST vs supportive therapy for older people with major depression and executive dysfunction
11 Sriwattanakomen 2008	RCT of PST with BA components vs a dietary education control condition in older black and white older adults with subthreshold depressive symptoms no data available
12 Gant 2007	RCT of BA in family carers of people with dementia incorporating improving mood through pleasant activities and managing problem behaviours
13 Götestam 1990	RCT of prompting and reinforcing activities in people with dementia vs prompting only vs control in which activities were not based on a BA model but on general activity training
14 Prick 2015	Multicomponent dyadic intervention in dementia caregiving dyads incorporating BA for the person with dementia, evaluated carer outcomes only
15 Lichtenberg 1996	Controlled trial (non RCT) of 2 behavioural treatments (selecting pleasant events, planning positive reinforcement strategies, and receiving support and reinforcement) in older inpatients with hip fracture, arthritis, and gait disturbances
16 Brand 1992	Controlled trial (non RCT) of group behavior therapy vs control in inpatient older adults with major depression
17 Clignet 2012	Case study of implementation of the Systematic Activation Method (SAM) incorporating activity scheduling as a nursing intervention in inpatients
18 Turner 2010	Case studies of BATA (Behavioral Activation Treatment of Anxiety) in older people
19 Guirguis-Younger 2008	Before-after experimental series design study of a behavioural-based intervention incorporating reinforcement of pleasant activities for older adults with depression

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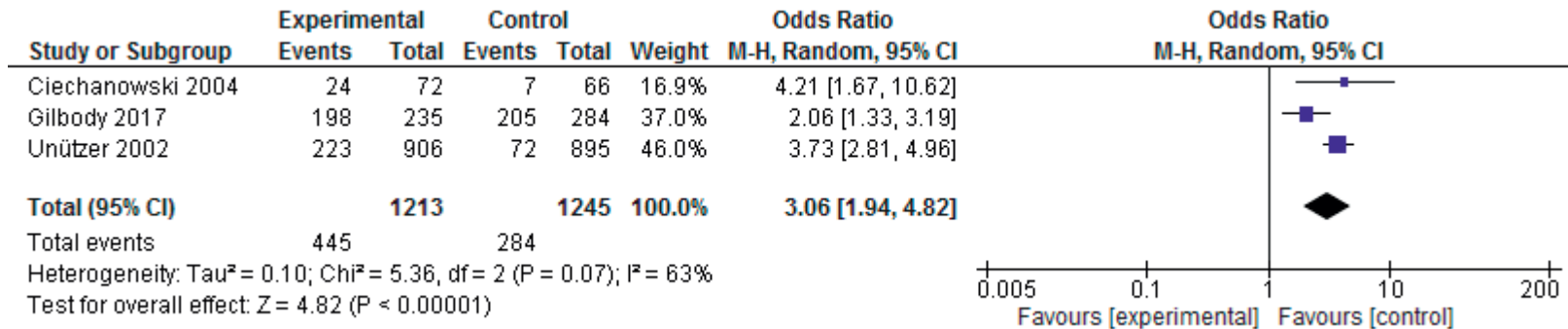
20	Thompson & Gallagher 1983	Before after study testing feasibility of a behaviourally oriented course of mood monitoring and learning to identify, record and monitor everyday pleasant activities in older adults
21	Teri 1991	Case studies investigating the relationship between pleasant activities and depression in people with dementia and depression by teaching carers to increase pleasant experience for the patient and decrease behavioural disturbances
22	Floyd 2004	RCT of cognitive bibliotherapy vs individual cognitive psychotherapy vs delayed treatment control in older people with depression
23	Yon & Scogin 2009	Before and after study of BA in older adults with depression
24	Teri 1991	Case study of behavioural treatment of depression in older people
25	Gallagher 1981	RCT of a behavioural intervention aimed at improving social skills and increasing the frequency of engagement of pleasant activities vs supportive group psychotherapy in older people with moderate to severe depression (no control group), no data available
26	Scogin 1987	Before and after study of cognitive bibliotherapy in older people with depression
27	Breckenridge 1987	Feasibility before and after study of the Life Satisfaction Course in older people with dysphoria
28	Jimenez 2015	Ongoing RCT of a health promotion intervention incorporating BA with a large physical activity component for older Latinos with subthreshold depression or anxiety
29	Quijano 2007	Controlled before-and-after study of an intervention incorporating education, referral and linkage with services and BA in high-risk older adults provided by case managers
30	Au 2015	RCT of telephone-assisted BA in Chinese family carers of people with dementia vs psychoeducation
31	Mausback 2014	RCT of BA in family carers of people with dementia vs support vs information
32	Sallis 1983	Controlled trial of depression management based on BA vs usual care
33	Vázquez 2015	RCT of BA vs CBT vs TAU in family carers of dependent family members
34	Lovett 1998	RCT evaluating the Life Satisfaction course focusing on increasing pleasant events in carers of dependent older adults vs waiting list
35	Alexopoulos 2003	RCT PST vs supportive therapy for older people with major depression and executive dysfunction
36	Rokke 1999	Self-help BA vs Cognitive Therapy (CT) for older people with depression, not all participants randomised

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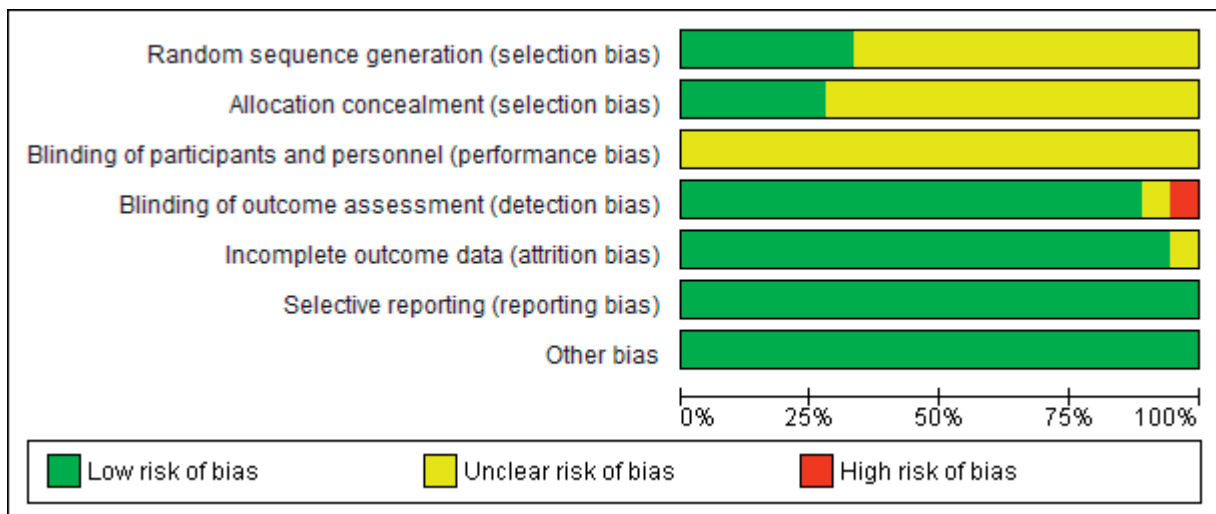




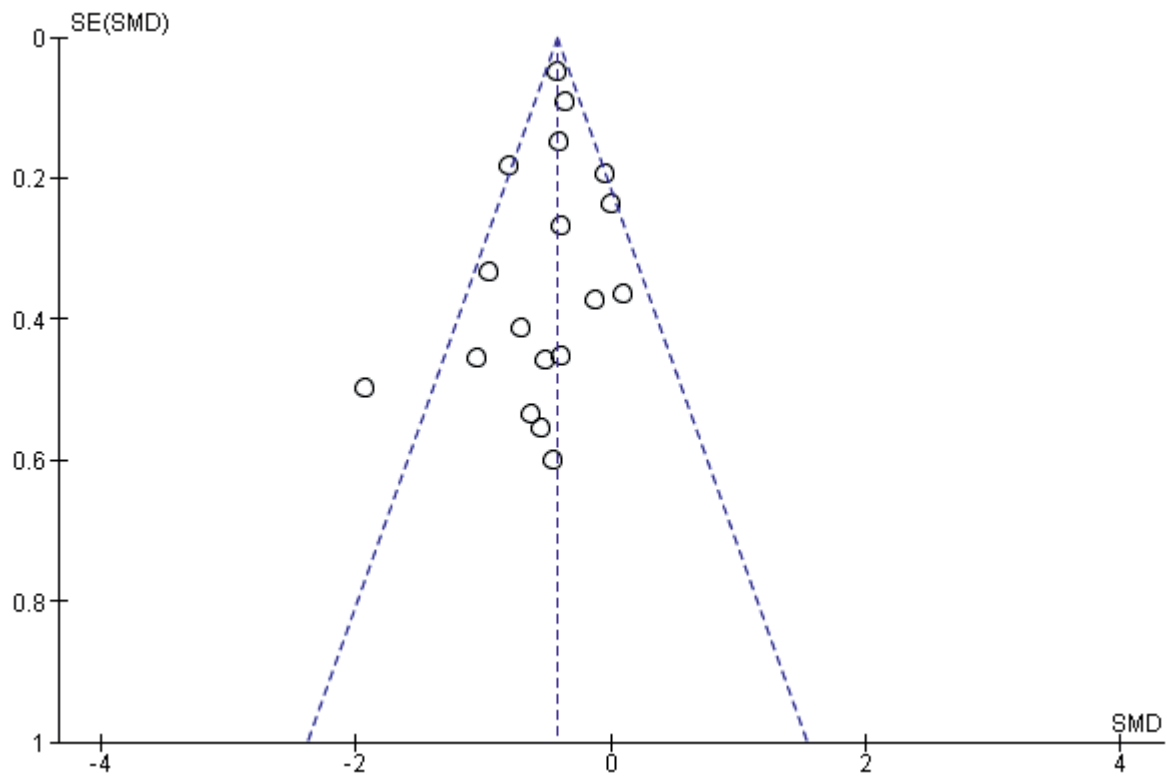
**Fig. DS1** Forest plot of multicomponent BA versus treatment as usual for older people living in the community with a diagnosis of depression or depressive symptoms. Outcome: Remission of depressive symptoms (3-6 months).



**Fig. DS2** Forest plot of multicomponent BA versus treatment as usual for older people living in the community with a diagnosis of depression or depressive symptoms. Outcome: Remission of depressive symptoms (8-12 months).



**Fig. DS3** Risk of bias graph: review authors' judgements about each risk of bias item presented as percentages across all included studies.



**Fig. DS4** Funnel plot as indicator of publication bias: All BA studies in older people, without imputed studies.