

Study	Intervention	BPSD reported in Guide	Study design	Outcome measures	Significance	Quality Rating
Therapeutic recreation						
Bailey 2000 (1)	<i>Question-asking Reading</i> (2) activity with a reminiscence component + individually prescribed behavioural program + prompt signs vs usual NH activities during 30 min sessions twice weekly over 6 weeks.	Apathy	<ul style="list-style-type: none"> • Clustered pseudo-RCT • 44 cognitively impaired residents of 4 NHs (35 females); intervention group n = 21, control group n = 19 • NH units randomised. Method not stated • Raters not blinded • No f/u 	Activity Behaviour Checklist; General Behaviour Checklist; Affect Rating Scale	Significant increase in engagement during <i>Question-asking Reading</i> activity ($p = .05$) but no significant difference between groups following activity. No significant change for interest on the Affect Rating Scale.	strong
Ballard et al. 2009 (3)	Brief psychosocial therapy (social interaction, personalised music, or removal of environmental triggers) over 4 weeks	Agitation	<ul style="list-style-type: none"> • Repeated measures design • 387 patients living in care facilities or in community with carer • AD with agitation • Single-blinded • No f/u 	CMAI	BPSD significantly improved overall agitation, aggression, physically non-aggressive behaviour and verbally agitated behaviours. Total CMAI improved specifically with social interaction while the other interventions did not show significant benefits.	moderate
Buettner & Fitz-simmons, 2002 (4)	Daily, small group therapy sessions of 1 hour which included wheelchair bicycle rides over 2 weeks; followed by a twice weekly maintenance program over 10 weeks vs control/delayed intervention group	Apathy	<ul style="list-style-type: none"> • Pseudo-RCT • "maintenance" program • 70 long-term care residents with dementia and depressive symptoms indicated by a GDS score of ≥ 4 • Randomisation not stated • Raters not blinded • F/u after further 10 weeks 	Observation	Significant increase in activity participation between pretest and post-test at 2 weeks ($p < .00$) as well as between pretest and follow up ($p < .00$) in treatment group but not control group. No group x time interaction effect reported.	moderate

Buettner et al. 2006, (5)	Individually prescribed therapeutic recreation 5 x weekly vs usual care + daily x 20 min social visits from research team over 2 weeks	Apathy	<ul style="list-style-type: none"> • Crossover pseudo-RCT • 112 residents of 5 long-term care residences with dementia (82 females) • Method of randomisation not stated. Participants also served as their own controls • Raters not blinded • No f/u 	Observation: time involved, level of engagement, encouragement needed and participation levels	Passive residents alerted 79-91% of the time, depending on the intervention category. Those activities in the physical intervention category showed the greatest percentage engagement. Statistical significance not reported.	moderate
Cohen-Mansfield et al. 2010 (6)	Standardised stimuli (living social, task, reading, self-identity, music, work, simulated social, and manipulative stimuli) vs usual care	Agitation VDB	<ul style="list-style-type: none"> • Repeated measures design • 111 NH residents • Dementia with agitated behaviour • No f/u 	ABMI	Total agitation was reduced in all stimulus conditions except for manipulative stimuli. Physical agitation was reduced in all stimulus conditions, while verbal agitation was reduced only with live social, task, reading, self-identity and music stimuli.	moderate
Connell et al. 2007 (7)	Outdoor activity program over 2 weeks	ND VDB	<ul style="list-style-type: none"> • Parallel-group, repeated measures design • 24 NH residents • Mild to severe dementia • No f/u 	CMAI Actigraphy	Outdoor activity had a small effect on improving maximum sleep duration. Total sleep time increased in both groups. Verbal agitation reportedly reduced in outdoor activity group.	moderate
Fitz-simmons & Buettner, 2002 (8)	Individually prescribed, at-home, therapeutic recreation during 1.5 hr sessions x 3-5 days per week, over 2 weeks vs usual homecare control condition followed by individually prescribed, therapeutic recreation	Apathy	<ul style="list-style-type: none"> • Crossover pseudo-RCT • 30 community-dwelling older adults with dementia (19 females) • Method of randomisation not stated • Raters not blinded • No f/u 	Colling's NH version of the PDS	Significant improvement in passivity for intervention condition but not control.	moderate

Fitz-simmons & Buettner, 2003 (9)	Adaptive therapeutic recreation cooking program of 1 hr sessions x 5 days per week, over 2 weeks vs usual facility activities followed by adaptive therapeutic recreation cooking program	Apathy	<ul style="list-style-type: none"> • Crossover pseudo-RCT • 24 female residents of a locked SCU with dementia and disturbed behaviours; intervention group n = 12, control group n = 12 • Method of randomisation not stated. Participants also served as their own controls • Raters not blinded • No f/u 	PDS Observation: engagement, active or passive participation and encouragement needed	Highly significant decrease in post-test passivity compared with pre-test scores for intervention group but not control group	moderate
Gitlin et al. 2008 (10)	Tailored Activity Program (OT intervention customised to capabilities) over 4 months	Apathy Depression	<ul style="list-style-type: none"> • Crossover RCT • 60 community-dwelling patient-carer dyads; Dementia • Single-blinded • No f/u 	Frequency of occurrence of 24 problem behaviours CSDD Investigator-developed index of activity engagement	Greater decrease in problem behaviours overall, as well as shadowing and repetitive questioning specifically, were observed in the intervention group. No effects on depression levels were found at endpoint. Greater improvements in activity engagement and ability to keep busy were reported in the intervention group.	strong
Kolanowski 2005 (11)	Activities matched to skill level vs activities matched to style of interest vs activities matched to both over 12 days	Apathy BPSD	<ul style="list-style-type: none"> • Randomised, crossover study • 33 NH residents • AD with BPSD • Single-blinded • No f/u 	CMAI PDS Observation: time on task and level of participation	Participants spent more time on task and participated more actively when activities were tailored to both their skills and interests. Passivity improved when activities were matched to either interests alone or to both skills and interests. No difference in agitation levels was found between intervention groups.	strong
Lee & Kim 2008 (12)	Indoor gardening Over 28 days	Agitation Nocturnal Distruption	<ul style="list-style-type: none"> • Repeated measures design • 23 institutionalised patients • Mild to severe dementia with sleep disturbance and/or agitation • No f/u 	M-CMAI Sleep diary	Agitation decreased after indoor gardening. Indoor gardening decreased wake after sleep onset frequency and duration, as well as napping frequency and duration. Nocturnal sleep time and efficiency were also improved.	moderate

Orsulic-Jeras et al. 2000, (13)	Montessori-based activities (individual and small group) vs regular activities (large and small group) programming in 15-30 min sessions twice weekly, over 9 months	Anxiety Apathy	<ul style="list-style-type: none"> • Interrupted time series without parallel control group. • No f/u • 16 residents in an advanced dementia unit (14 females) • Participants served as their own controls • Raters not blinded 	4 levels of engagement: constructive (CE), passive (PE), non (NE) and self (SE) engagement observed in 10 min windows as measured by a scale developed by the authors	Significant main effect for CE and PE. Instances of NE and SE not often observed during either activity periods. Significant main effect for treatment and time in anxiety when compared with regular activities.	moderate
Politis et al. 2004 (14)	Kit-based activity intervention vs one to one time and attention intervention for 30 mins, 3 x per week over 4 weeks	Apathy	<ul style="list-style-type: none"> • RCT • 36 residents of a specialist long term dementia care facility (18 females) • Randomised with table of numbers in blocks of 4 • Raters masked to treatment assignment • No f/u 	NPI CRAI	Significant within group improvements on NPI apathy in both kit-based intervention group ($p = .05$) and one to one intervention group ($p = .01$). No significant difference between groups in activity participation on the CRAI.	strong
Putman & Wang 2007 (15)	The Closing Group intervention (therapeutic recreation) over 2 years	Agitation Anxiety	<ul style="list-style-type: none"> • Longitudinal study • 16 LTC residents • Severe dementia with BPSD • No f/u 	CMAI CSDD	Post-intervention agitation was lower compared to baseline. Anxiety was reduced.	moderate
Behavioural / cognitive-behavioural interventions						
Balasubramanyam et al. 2007 (16)	Cognitive-behavioural therapy over 10 weeks	Anxiety	<ul style="list-style-type: none"> • Single case study • Sub-cortical dementia with generalised anxiety disorder, post-traumatic stress disorder and major depression • No f/u 	RAID Penn State Worry Questionnaire HAM-D	No changes were found in RAID scores. Improvements were reported on both the Penn State Worry Questionnaire and the HAM-D.	case study
Beattie et al. 2004 (17)	Behavioural communication intervention over 5 weeks	Wandering	<ul style="list-style-type: none"> • 3 case reports, NH residents • AD with wandering behaviour • No f/u 	Observation: frequency of table-leaving and mean time sitting at the table	Mean frequency of table-leaving events significantly decreased in 2 of 3 cases. Mean time sitting at the table significantly increased in all three cases.	case series

Birchmore & Clague 1983 (18)	Behavioural programme (stroking on the back when quiet). Duration not reported	VDB	<ul style="list-style-type: none"> • Single case study, NH resident • Dementia • No f/u 	Observation of time spent vocalising	Time spent vocalising was reduced during intervention sessions.	case study
Bird et al. 1995 (19)	Cued recall Variable duration	VDB	<ul style="list-style-type: none"> • 5 case reports • AD/VaD/mixed/postanoxia dementia with BPSD • No f/u 	Observation of frequency of behaviours	Improvements were observed in four of the five persons with dementia.	case series
Bourgeois et al. 1997 (20)	Home visit training on cued recall over 12 weeks	VDB	<ul style="list-style-type: none"> • Case series • 14 community-dwelling patient-carer dyads; intervention n = 7, control n = 7 • AD with BPSD • 6-month f/u 	Observation of frequency of repetitive verbalisations	The frequency of verbalisations in the intervention group was reduced in both the intervention phase, whereas it increased in the control group. Intervention effects were maintained at the 6-month f/u.	case series
Buchanan & Fisher 2002 (21)	Non-contingent reinforcement Variable duration	VDB	<ul style="list-style-type: none"> • 2 case reports, NH residents • Dementia with frequent disruptive vocalisations • No f/u 	Observation of frequency of disruptive vocalisations	Decreases in disruptive vocalisations were observed following non-contingent reinforcement.	case series
Davison et al. 2007 (22)	Individualised psychosocial intervention based on the behavioural therapy Variable duration	Aggression	<ul style="list-style-type: none"> • Repeated measures design • 34 psychogeriatric aged care residents • Mild to severe dementia with BPSD • No f/u 	CMAI	The frequency of aggressive and verbally agitated behaviours declined significantly, but there was no change in the frequency of physically non-aggressive.	moderate
Ingersoll-Dayton et al. 1999 (23)	Solution-focused therapy vs control over 7 weeks	Wandering BPSD	<ul style="list-style-type: none"> • RCT • 21 NH residents and 84 family members and certified nursing assistants; group numbers not reported • Dementia with aggression or wandering • 7-week f/u 	Modified Caretaker Obstreperous-Behaviour Rating Assessment Scale	Frequency and severity of aggression and wandering diminished. Outcomes of the intervention group did not differ from those of the control group post-intervention or at f/u.	moderate

Kraus et al, 2008 (24)	Cognitive-behavioural treatment over 2 years	Anxiety	<ul style="list-style-type: none"> • 2 case studies • Mild AD with anxiety • No f/u 	RAID NPI anxiety subscale	Decreases in the RAID and NPI anxiety subscale scores were reported.	case studies
Marriott et al. 2000 (25)	Cognitive-behavioural family intervention, 14 sessions	Depression	<ul style="list-style-type: none"> • RCT • 42 community-dwelling patient-carer dyads; no-interview control n = 14, interview control n = 14, family intervention n = 14 • AD • Single-blinded • 3 month f/u 	CSDD	No group differences were found on the CSDD.	strong
Paukert et al. 2010 (26)	Peaceful Mind, a cognitive-behavioural intervention therapy over 6 months	Anxiety	<ul style="list-style-type: none"> • Open trial • 9 community-dwelling persons with dementia • Mild to moderate dementia with anxiety • No f/u 	NPI anxiety subscale Penn State Worry Questionnaire Geriatric Anxiety Inventory	Most participants reported improvements in their levels of anxiety as well as depressive symptoms.	moderate
Reminiscence-based interventions						
Caserta & Lund, 2002 (27)	Video respite using a 20-min videotape about growing up in the 1920s-30s Group viewing vs solitary viewing over 4 weeks	Apathy	<ul style="list-style-type: none"> • Repeated measures design • 12 NH residents • Dementia • No f/u 	Observation: verbal and nonverbal responses, interest, enjoyment, ease of responding, eye contact	Significantly higher nonverbal responses and a nonsignificant trend toward higher verbal responses occurred in the solitary viewing condition when compared to the group viewing condition. No significant change was found on the other behaviours.	moderate
Chapman et al. 2004, (28)	Cognitive-communication stimulation program with home assignments plus donepezil vs donepezil only over 8 weeks	Apathy	<ul style="list-style-type: none"> • RCT • 50 community-dwelling older adults with mild to moderate AD (29 females) • Random assignment generated using SAS statistical software (SAS Institute, Cary, NC). • Apathy item raters blinded • 8 and 12 month f/u 	NPI	Apathy change scores for the cognitive-communication program with donepezil approached significance ($p = .08$) suggesting reduced apathy over time. Lower apathy scores maintained at f/u.	strong

Garland et al. 2007 (29)	Simulated family presence (SFP) vs preferred music (PM) vs placebo (neutral reading from gardening book) vs usual care over 26 days	Agitation VDB	<ul style="list-style-type: none"> • Crossover RCT • 30 NH residents; SFP/PM/placebo n = 10, PM/placebo/SFP n = 10, placebo/SFP/PM n =10 (all received usual care before the start of the study) • Dementia with BPSD • Single-blinded • 15-minute f/u 	CMAI	Physically agitated behaviour decreased more during simulated presence than placebo and usual care. Music only reduced physical agitation more than usual care but not placebo. These effects were maintained at 15 minutes post-intervention. Verbally agitated behaviour decreased more during simulated presence and placebo than usual care. At 15 minutes post-intervention, the effects of simulated presence and placebo were maintained. The music group continued to improve post-intervention.	moderate
Haight et al. 2006 (30)	Life review / life storybook over 6 weeks	Depression	<ul style="list-style-type: none"> • RCT • 30 assisted living residents Mild to moderate dementia • No f/u 	CSDD AMS	Post-intervention, the level of depression in the intervention group was significantly lower than in the usual care group. Positive mood also improved.	moderate
Lai et al. 2004 (31)	Individual life-story intervention vs social contact vs control over 6 weeks	Apathy	<ul style="list-style-type: none"> • RCT • 101 NH residents: intervention n = 36 comparison n = 35 control n = 30 • Dementia • Single-blinded • 6-week f/u 	Social Engagement Scale	Social engagement improved at the 6-week f/u but not immediately post-intervention in the intervention group. The improvements, however, were not different between groups.	strong
Tadaka & Kanagawa 2007 (32)	Reminiscence therapy (RT) during 60-90 min weekly sessions vs routine day care service over 8 consecutive weeks	Apathy	<ul style="list-style-type: none"> • RCT • 60 elderly attendees of community day care with dementia (42 females) • AD/VaD • Computer generated randomisation within subsets of dementia type • Raters not blinded • 6 month f/u 	MOSES withdrawal subscale	Significant improvement on withdrawal for RT in AD group immediately following intervention but not at f/u ($p < .05$); significant improvement immediately following intervention and at follow up on withdrawal for RT in VaD group ($p < 0.01$)	strong

Exercise						
Aman & Thomas 2009 (33)	Supervised exercise (aerobic exercise and resistance and balance exercise) over 3 weeks	Agitation Depression	<ul style="list-style-type: none"> Prospective comparative study 50 SCU residents; exercise n = 40, control n = 10 Severe dementia with BPSD No f/u 	PAS CMAI CSDD	Agitation improved on the PAS in the subgroup who had clinically significant agitation at baseline. No overall effects were found on the PAS or the CMAI. No intervention effect was found on depressive symptoms.	moderate
Cevasco & Grant, 2003 (34)	<p>Exercise-to-movement activity. Combinations of continuous cueing vs single cueing and difficult condition (i.e., participating in designated movement) vs easy condition (approximating the movement) 38 weekly or twice weekly 50 min sessions over 8 months.</p> <p>Exercise-to-music activity consisting of combinations of vocal music vs instrumental music and with instruments vs without instruments during 26 weekly or twice weekly 50 min sessions over 6 months.</p>	Apathy	<p>Study 1:</p> <ul style="list-style-type: none"> Interrupted time series without parallel control group. 14 assisted living residents Early to middle stages of AD No f/u <p>Study 2:</p> <ul style="list-style-type: none"> Interrupted time series without parallel control group. 12 assisted living residents with early to middle AD (11 females) Order of movement activities randomised but method not stated. Participants served as their own controls No f/u 	Observation: responsiveness and participation	<p>Continuous cueing/easy condition resulted in significantly higher participation than the single cueing/difficult condition ($p < .05$).</p> <p>Exercise to instrumental music resulted in significantly higher participation than exercise with instruments to vocal music ($p < .05$).</p>	moderate
Conradsson et al. 2010 (35)	High-intensity functional exercise vs control OT activities over 3 months	Depression	<ul style="list-style-type: none"> RCT 191 RACF residents 52% with dementia Single-blinded 3-month f/u 	GDS	No group differences were observed in levels of depression at endpoint or at 3-month f/u.	strong

Cott et al. 2002 (36)	Walk-and-talk sessions vs talk-only sessions vs usual program over 16 weeks	Apathy	<ul style="list-style-type: none"> • RCT • 86 RACF residents; walk-and-talk n = 30, talk only n = 25, control n = 19 • AD • No f/u 	LPRS disengagement subscale	<p>No significant between-group differences were found on outcome measures at post-test.</p> <p>No within-group differences were found on the LPRS disengagement subscale.</p>	strong
Edwards et al. 2008 (37)	Group exercise program 12 weeks	Anxiety Depression	<ul style="list-style-type: none"> • Repeated measures design • 36 RACF residents • Moderate to severe dementia • No f/u 	PCGAAR	<p>Anxiety improved both immediately and after 12 weeks.</p> <p>There were no short-term effects on depression and in 6% of participants scores declined further after 12 weeks.</p>	moderate
Landi et al. 2004 (38)	Moderate intensity exercise sessions comprising aerobic/endurance activities, strength training, balance, and flexibility training (as part of bigger integrated treatment program) vs integrated treatment program without exercise sessions over 4 weeks	Wandering BPSD	<ul style="list-style-type: none"> • Randomised case-control study • 30 RACF residents; exercise n = 15, control n = 15 • Mild dementia • No f/u 	MDS-NH	Significant reduction in wandering as well as physical and verbal abuse (statistics not reported).	modest
Teri et al. 2003 (39)	Exercise plus behavioural management vs usual care over 3 months	Depression	<ul style="list-style-type: none"> • RCT • 153 patient-carer dyads • Probable or possible AD • Block randomisation • 2 year f/u 	HAM-D CSDD	<p>Patients in the intervention group improved significantly on the CSDD while those receiving usual care declined ($p = .02$) at endpoint. Effects in those with higher depression scores at baseline maintained at f/u.</p> <p>No significant group differences were found on the HAM-D.</p>	strong

Thomas et al. 2006 (40)	Supervised walking program	Wandering	<ul style="list-style-type: none"> • Repeated measures design • Convenience sample of 13 NH residents • AD and identified by NH staff as a wanderer • Raters not blinded • 2 week f/u 	Observer frequencies recorded on sheet as standing/walking or sitting/lying	Walking program had minimal effect on overall wandering frequency	modest
Williams & Tappen 2008 (41)	Exercise vs walking vs social conversation	Depression	<ul style="list-style-type: none"> • Randomised, repeated measures design • 45 NH residents; group numbers not reported • Moderate to severe AD with depression • No f/u 	CSDD DMAS AMS OAS	<p>Significant mood/affect improvements were observed in seven out of eight measures of depression (with all three groups pooled together).</p> <p>Groups were found to be different on 2 of 8 measures only (i.e. OAS-2 week positive and AMS-negative subscale).</p>	strong
Music						
Ashida, 2000 (42)	Two weeks of no music therapy followed by reminiscence music therapy in 5 x daily sessions of an average 43 mins, over 1 week	Apathy	<ul style="list-style-type: none"> • Interrupted time series without parallel control group • 20 residents with from 2 RACFs divided into 4 small groups and treated identically (17 females) • Dementia • Participants served as their own controls • Raters not blinded • No f/u 	Level and characteristics of on-task active and passive participation as recorded on videotape	No significant increase in active participation. Decrease in passive participation in 3 of the 4 groups as treatment weeks progressed.	moderate
Casby & Holm 1994 (43)	Classical music + favourite music vs classical only vs favourite only	VDB	<ul style="list-style-type: none"> • 3 participants • method of randomisation not reported • Raters not blinded 	Observations measure of VDB per 10 seconds for 2x10 minute intervals for each phase	<p>Subject 1: both classical and favourite music reduced VDB ($p < .05$);</p> <p>Subject 2: Favourite music reduced VDB ($p > .05$);</p> <p>Subject 3: Classical music did not reduce VDB ($p > .05$)</p>	modest

Chang et al. 2010 (44)	Lunchtime music programme – 8 weeks	Aggression	<ul style="list-style-type: none"> • Repeated measures design • 47 NH residents • Dementia with BPSD • No f/u 	CMAI	Both physically and verbal aggression were increased during the week in which the lunchtime music programme was administered ($p < .05$) but decreased in the following week ($p < .05$), possibly due to a delayed effect.	moderate
Choi et al. 2009 (45)	Group music intervention vs control (usual care) – 50mins x 3/wk x 5 weeks	Agitation Depression Psychotic symptoms	<ul style="list-style-type: none"> • Pilot study • 20 dementia-specific day care attendees • Dementia • Rater blinding not reported • No f/u 	NPI (severity and caregiver distress) GDS	<p>Symptom severity in the music group decreased on the NPI total, and the hallucinations, agitation, disinhibition and irritability subscales. Caregiver distress in the music group decreased on the NPI total, and the depression, anxiety and irritability subscales.</p> <p>Greater improvements were observed in the music group compared to control in terms of the GDS ($p = .08$), symptom severity on the NPI total ($p = .004$) and agitation ($p = .02$), caregiver distress on the NPI total ($p = .003$).</p>	moderate
Clair, 2002 (46)	Music therapy - singing or dancing in weekly sessions of 40 min over 6 weeks	Apathy	<ul style="list-style-type: none"> • Interrupted time series without parallel control group. • 8 couples consisting of residents with advanced dementia in a SCU and their carers (4 females) • Participants served as their own controls • Raters not blinded • No f/u 	Engagement: interaction between carer and care receiver defined as touch, conversation or looking as well as singing, vocalising, moving or dancing to music as recorded by a trained observer	Highly significant increase in mean, posttest engagement scores when compared with pretest engagement scores ($p = .024$).	moderate

Clarkson et al. 2007 (47)	Music concerts – 1 hr x 5 days/week over 3 weeks	Aggression Agitation	<ul style="list-style-type: none"> • Within-subject case-control series design • 17 NH patients with moderate or severe dementia • Rater blinding not reported • 3 week f/u 	CMAI CSDD	<p>Neither physical nor verbal aggression was reduced. Effects evident only at f/u.</p> <p>Physical non-aggressive agitation was reduced in the post-intervention phase compared to baseline and the music phase ($p = .025$ and $p = .043$ respectively) in those with moderate dementia only.</p> <p>Verbal non-aggressive agitation increased in the music and post-intervention phases compared to baseline ($p = .015$ and $p = .01$ respectively), though nursing staff and families did not perceive the participants as being more agitated or difficult to manage.</p>	moderate
Cooke et al. 2010 (48)	Live group music program (facilitated engagement with song-singing and listening) vs facilitated group reading sessions; 40mins x 3 morning/week x 8 weeks, 5-week washout period before crossover	Aggression Agitation Anxiety	<ul style="list-style-type: none"> • Crossover RCT • 47 LTC residents • Dementia • Randomisation conducted by blinded biostatistician • Rater blinded • No f/u 	CMAI-SF RAID	<p>No overall or interaction effects of the music intervention on either agitation or anxiety.</p> <p>A sub-analysis on 24 of the participants (taken from both groups) showed a significant increase in the frequency of verbal aggression ($p < .05$).</p>	strong

Groene, 2001 (49)	Music therapy consisting of 4 sing-along group sessions of combinations of each of the 4 conditions: live (L) and recorded (R) presentation modes with simple (S) and complex (C) accompaniment styles. Total sessions 16. Duration and frequency not reported	Apathy	<ul style="list-style-type: none"> • Interrupted time series without parallel control group. • 8 residents with dementia in a SCU (7 females) • Order of conditions (L/S, L/C, R/S, R/C) randomised by a latin square design. • Blinding of raters not stated • No f/u 	Participation and responding as measured by number of: affirmative verbalisations made, leaving the group, facing therapist with eye contact, readiness to sing, nods of affirmation before and after sessions + reading lyrics, singing or mouthing songs and applauding.	Participation, as evidenced by affirmative verbalisations ($p = < .01$) and applause after ($p = < .043$) were significantly higher for live sessions, overall, than for recorded; leaving the group was significantly higher for R/S condition ($p = \leq .01$); joining in with reading lyrics was significantly higher for L/C condition ($p = .03$); facing therapist with eye contact at end of songs was significantly higher for L/C and R/C conditions ($p = .00$); applause was significantly higher for L/C condition ($p \leq .02$)	strong
Guétin et al. 2009 (50)	Individual receptive music therapy according to the 'U' sequence method (Guétin et al '09, Jaber et al '07 cited in (50))	Anxiety	<ul style="list-style-type: none"> • Randomised controlled, comparative design. • 30 nursing home residents with mild to moderate dementia • Randomisation generated in blocks of 4 • Raters blinded • 24 week f/u 	Ham-D Scale	Significant improvement in anxiety ($p < 0.01$) in the music therapy group between week 4 and week 16. Effects were sustained up to 8 weeks after intervention ceased ($p < 0.01$).	strong
Hicks-Moore & Robinson 2008 (51)	Hand massage, favourite music, or combined hand massage and favourite music; each lasting 10min	Agitation VDB	<ul style="list-style-type: none"> • RCT • 41 patients with dementia from SCUs; intervention $n = 32$, control $n = 9$ • Randomisation method unknown • Rater not blinded • 1 hour f/u 	CMAI	Agitation in intervention conditions lower than in control (statistics not provided). Physically non-aggressive behaviours and verbally agitated behaviours reduced post-treatment and then remained stable at f/u ($p < .001$). Effects did not differ between intervention conditions. Effects sustained at f/u	moderate

<p>Holmes et al. 2006 (52)</p>	<p>Live interactive music therapy vs pre-recorded music sessions vs silence during 1 x 1.5 hr session consisting of 30 min period for each condition</p>	<p>Apathy</p>	<ul style="list-style-type: none"> • Interrupted time series without parallel control group. • 32 NH residents with moderate to severe dementia (28 females) • Order of silence and musical periods randomised. Method not stated • Blinded independent, observer-raters • No f/u 	<p>Positive engagement as measured by DCM Behaviour Category Codes (53, 54) according to video recordings rated at 3 min intervals by a trained, independent rater</p>	<p>Positive engagement during live music sessions was significantly greater than during pre-recorded music ($p < .01$) and silent ($p < .00$) sessions; positive engagement during pre-recorded music was not significantly greater than during silent periods.</p>	<p>strong</p>
<p>Ledger & Baker 2007 (55)</p>	<p>Group music therapy vs usual care; weekly sessions (30-45mins) over at least 42 weeks</p>	<p>Agitation VDB</p>	<ul style="list-style-type: none"> • Longitudinal repeated measures design • 45 NH patients with possible or probable AD; intervention $n = 26$, control $n = 19$ • Not randomised • Rater not blinded • No f/u 	<p>CMAI</p>	<p>Post-intervention, the range and frequency of agitated behaviours in the two groups were similar ($p = .432$), although the control group initially had more agitated behaviours.</p> <p>Changes in severity of agitation over time were not different between groups (verbal non-aggressive, $p = .57$; verbal aggressive, $p = .45$; physical non-aggressive, $p = .44$; physical aggressive, $p = .38$).</p> <p>Qualitatively, therapists noted fewer instances of agitated behaviours.</p>	<p>moderate</p>
<p>Lesta & Petocz 2006 (56)</p>	<p>Familiar group singing during sundowning hours with active participation encouraged</p>	<p>VDB</p>	<ul style="list-style-type: none"> • Single group repeated measures • 4 (all participants completed the same intervention) • Raters not blinded • No f/u 	<p>Mood-behaviour assessment, with mumbling item relevant to VDB, developed by the authors</p>	<p>Reduction in mumbling (pre vs post intervention).</p>	<p>moderate</p>

Mathews et al. 2001 (57)	Exercise activities vs exercise activities with rhythmic music, 22 mins x 5 days/week over 25 weeks	Apathy	<ul style="list-style-type: none"> • Interrupted time series without parallel control group. • 18 residents in a residential, dementia SCU (17 females) • Participants served as their own controls • Raters not blinded • No f/u 	Observation: participation	Mean group engagement scores increased in the exercise activities with rhythmic music condition when compared with exercise activities alone. Statistical significance not reported.	moderate
Park & Pringle Specht 2009 (58)	Individualised music – 30mins (prior to peak agitation time) x 2/wk x 2 weeks, followed by no intervention x 2 weeks; 8 weeks	Agitation	<ul style="list-style-type: none"> • Pilot study • 15 community patients • Dementia • No f/u 	M-CMAI	Agitation levels were lower during the intervention compared to baseline ($p < .05$), and was maintained both during the non-intervention weeks and post-intervention.	moderate
Raglio et al. 2008 (59)	Nonverbal music therapy using rhythmical and melodic instruments vs educational and entertainment activities in 10 x 30 min session over 16 weeks	Apathy Psychotic symptoms	<ul style="list-style-type: none"> • Pseudo-RCT • 59 residents with AD or VaD from 3 NHs). Experimental group n = 30; control group n = 29 (25 females each group) • Residents allocated alternately to control or experimental group • Raters blinded • 4 week f/u 	Apathy change scores as measured by the NPI as well as active participation as measured by empathetic behaviour, smiles, singing and body movements synchronic with the music	Significant improvement in apathy scores between pretest and follow up ($p < .05$) in treatment group but not control group. Active participation also increased in the treatment group over time: empathetic behaviour ($p < .0001$), smiles ($p < .0001$), singing ($p < .0003$) and synchronic body movements ($p < .0001$). Participation data for control group and group x time interaction effect not reported.	moderate
Raglio et al. 2010a (60)	Three cycles of 12 x 30 mins music therapy sessions 3 x weekly vs standard educational and entertainment activities	Apathy Depression Psychotic symptoms BPSD	<ul style="list-style-type: none"> • RCT • 60 N/H residents • Randomisation method not reported • Raters blinded • 4 week f/u 	NPI	Significant reduction reported for delusions and apathy on subscale scores as well as NPI total score ($p < .0001$) in the intervention group and benefits were maintained at f/u. Depression, anxiety and irritability significantly improved in control and intervention groups and benefits were maintained at f/u.	strong

Raglio et al. 2010b (61)	Music therapy	Apathy Depression Anxiety	<ul style="list-style-type: none"> • Randomised comparison group design. • 20 N/H residents • Randomised by QuickCalcs computer program • Raters blinded • 4 week f/u 	NPI	<p>NPI total score showed a slight, but insignificant decrease in intervention group ($p=0.62$). Slight increase in NPI total score was showed in the control group ($p = 0.021$).</p> <p>NPI subscore for depression significantly decreased in treatment group ($p=0.021$) but not control group.</p> <p>No significant effects on any other NPI subscales.</p>	strong
Ridder et al. 2009 (62)	Music therapy 4 sessions weekly over 4 weeks	Agitation	<ul style="list-style-type: none"> • Mixed method case studies • 2 participants in a psychiatric N/H • Advanced FTD 	CMAI NPI	<p>Decreased nonaggressive agitated behaviour as measured by the CMAI is reported.</p> <p>No significant changes are reported on NPI scores. Some positive qualitative data are reported.</p>	case studies
Remington 2002 (63)	Calming music vs hand massage vs calming music + hand massage vs no intervention 10 min exposure	Wandering	<ul style="list-style-type: none"> • 4 group, repeated measures experimental design • 68 NH residents (59 females) • Dementia 	Modified CMAI	Significant reduction in physically nonaggressive behaviours reported in the 3 intervention groups reported ($p < .01$). No additional benefit reported for combined intervention condition.	moderate
Sherratt et al. 2004 (64)	Live music (guitar playing and singing by semi-professional musician) vs taped commercial music vs taped recording of music played by the musician vs no music during 1hr sessions for each condition over 3 months. 4 conditions counter-balanced.	Apathy	<ul style="list-style-type: none"> • Interrupted time series without parallel control group. • 24 participants with moderate to severe dementia as well as signs of social withdrawal and minimal engagement (16 continuing care ward residents, 7 day hospital attendees and 1 observed across both settings (10 females) • Participants served as their own controls. • Raters not blinded • No f/u 	Increased engagement defined as meaningful activity, engagement with music source, interaction with music source and specific responses to music (e.g. clapping, singing) as measured by DCM using continuous time sampling and direct observations by trained observers	Significant reduction in percentage of time spent in no meaningful activity for live music condition when compared with 3 other conditions ($p = .01$). Significant increase in percentage of time spent in engagement with music source ($p = .01$), interaction with music source ($p = .01$) and responses to music ($p = .01$) as well as significant reduction in percentage of time spent in no observable response to music ($p = .01$) for live music condition when compared with other music conditions. Significant reduction in percentage of time spent in passive behaviours for live music condition when compared with no music condition ($p = .05$).	moderate

Sung et al. 2006 (65)	Preferred music – 30mins x twice a week x 6 weeks	Agitation VDB	<ul style="list-style-type: none"> • Quasi-experimental design • 57 NH patients with dementia; intervention n = 32, control n = 25 • Randomisation method not reported • Rater blinding not reported • No f/u 	CMAI	<p>Post-intervention, total agitation and physically non-aggressive behaviours were lower in the intervention group than in the control group ($p = .033$ and $p < .001$ respectively), while the groups initially had comparable levels of agitated behaviours.</p> <p>No differences in physically aggressive behaviours or verbally agitated behaviours were reported.</p>	moderate
Sung et al. 2006 (66)	Group music with movement – 30mins x twice a week x 4 weeks	Agitation	<ul style="list-style-type: none"> • RCT • 36 patients with dementia; intervention n = 18, control n = 18 • Permuted block randomisation • Rater blinding not reported • No f/u 	M-CMAI	Reduction in agitated behaviours was greater in the intervention group compared to the control group ($p < .001$).	moderate
Sung et al. 2010 (67)	Preferred music listening intervention. 30 minute music listening session based on preference 2x week for 6 weeks vs standard care with no music	Anxiety	<ul style="list-style-type: none"> • Quasi-experimental pretest and posttest design • 52 participants • Randomisation • Rater blinding not reported 	RAID	Significantly lower anxiety in intervention group at 6 weeks compared to those in control ($p=0.001$)	moderate
Svansdottir & Snaedal 2006 (68)	Music therapy	Aggression Psychotic symptoms	<ul style="list-style-type: none"> • RCT • 38 NH/psychogeriatric ward patients with moderate-severe AD; music therapy n = 20, control n = 18 • Randomised • Rater blinded 	BEHAVE-AD (Icelandic version)	<p>Symptoms rated on the activity disturbances subscale decreased ($p = .02$) in the intervention group but not in the control group. There were no significant changes on any other subscale.</p> <p>There was a significant improvement on the symptom cluster rated on the activity disturbances – aggressiveness – anxiety subscales ($p < .01$).</p>	moderate

Tuet & Lam 2006 (69)	Music therapy vs usual care; 45mins x 3 times per week x 3 weeks, followed by 3-week washout then crossover	Agitation	<ul style="list-style-type: none"> • Crossover design • 16 patients with dementia; MT/usual care n=8, usual care/MT n = 8 • Randomisation not reported • Rater blinding not reported • 3 week f/u 	CMAI	Agitation was reduced immediately post-intervention ($p < .001$), but then quickly returned to baseline levels after 3 weeks of withdrawal. Effects not sustained at f/u.	moderate
Animal-assisted therapy						
Greer et al. 2001 (70)	The presence of toy cats vs live cats vs no stimuli during 3 x 10-minute sessions (no time frame reported)	Apathy	<ul style="list-style-type: none"> • Interrupted, cross-over time series without parallel control group • 6 female NH residents with moderate dementia • Order of condition randomised. Method not stated. • Participants served as their own controls. • No blinding of raters. Video recordings scored by an examiner not present at the session • No f/u 	Mean verbal initiations defined as utterances produced without a verbal model and total number of legitimate words produced within sessions	Greatest influence on overall performance observed for live cat condition (estimated mean difference between pre and post 0.8 initiations/min) when compared with toy cat condition (no difference). Performance effect was greater in the group exposed to live cats before toy cats possibly due to participants in both groups progressively losing interest in the study. Statistical significance not reported.	modest
Libin & Cohen-Mansfield 2004 (71)	Robotic cat therapy vs plush toy cat therapy; 1 interactive session of 10mins each condition, on separate days vs no therapy	Apathy	<ul style="list-style-type: none"> • Pretest-posttest case series without parallel control group • 9 NH residents with moderate to severe dementia (all females) • Order of sessions randomised. Method not stated. • Participants served as their own controls • Raters not blinded • No f/u 	Engagement: quality, duration, attention, attitude and intensity of manipulation with stimuli as well as interest as rated by trained observers	Significant increase in interest for the robocat condition but not the plush cat ($p = .03$). No significant differences were found for either condition in the engagement parameters.	moderate

Moto-mura et al. 2004 (72)	Animal-assisted therapy with 2 dogs for 1 hour over 4 consecutive days	Apathy	<ul style="list-style-type: none"> • Pretest-posttest case series without parallel control group • 8 female, NH residents with mild dementia • Participants served as their own controls • Raters not blinded • No f/u 	Activity and apathy state as measured by the apathy subscale of the Irritability/Apathy Scale (73)	Significant decrease in apathy scores after therapy when compared to before therapy ($p \leq .05$)	moderate
Richeson 2003 (74)	Animal-assisted dog therapy for 1 hr daily vs usual care 5 days per week over 3 weeks	Apathy	<ul style="list-style-type: none"> • Interrupted time series without parallel control group • 15 residents with dementia from SCUs within 2 NHs (14 females) • Participants served as their own controls • Raters not blinded • No f/u on social interaction 	Social interaction as rated by a trained observer using the 9 item Animal-Assisted Therapy flow sheet (75). Behaviours recorded include looking at, speaking to, touching, engaging in an activity with the dog or the handler.	Significant increase between pretest and posttest scores on social interaction ($p = .009$)	moderate
Sellers 2006 (76)	Animal assisted therapy – 15mins x 5 times	Agitation	<ul style="list-style-type: none"> • Repeated measures case series • 4 LTC patients with dementia • Rater blinded • No f/u 	ABMI	Fewer agitated behaviours were manifested during treatment compared to baseline ($p < .0001$).	case series
Tune & Rosenberg 2008 (77)	Large stuffed toy animal	Disinhibition	<ul style="list-style-type: none"> • Single case study • Assisted living resident • AD or FTD (undecided) 	Observation	Following failed attempts at managing the behaviour with neuroleptic medications, the stuffed toy animal was provided with some effect. The resident fondled the toy and became less intrusive with staff and other residents.	case study
Sensory interventions						

Baker et al. 2003 (78)	MSS vs control activity during 30 min sessions twice weekly over 4 weeks	Apathy Anxiety Wandering	<ul style="list-style-type: none"> • RCT • 136 older adults with dementia (94 community dwelling and 42 psychogeriatric inpatients); intervention group n = 65, control group n = 71 • Computer randomisation with epidemiology software • Raters not blinded • 1 month f/u 	Apathy subscale of the BRS section of the Clifton Assessment Procedures for the Elderly, apathetic/withdrawn subscale of the BMD, non-social behaviour subscale of the GIP as well as spontaneity, initiative and inactivity as rated with the 'Interact' form developed by the authors	<p>No significant differences between MSS and control activity groups from before to after sessions.</p> <p>Significant main effects of time. Both groups related better to others ($p < 0.0001$) and were less bored /inactive ($p < 0.0001$) after sessions when compared with before. The severely cognitively impaired in the MSS group were significantly less apathetic on the BRS apathy subscale after sessions when compared with ($p < 0.01$). Improvement had deteriorated at f/u.</p>	strong
Ballard et al. 2002 (79)	Melissa oil combined with a base lotion applied to participants faces and arms twice daily	Wandering	<ul style="list-style-type: none"> • RCT • 72 NH residents • Dementia • Rater blinded • No f/u 	CMAI NPI irritability and aberrant motor behaviour sub-scales Quality of life parameters	<p>Total score on CMAI reduced after treatment with lavender oil ($p < .0001$).</p> <p>Quality of life indices showed significant improvement in participants receiving essential Melissa balm ($p < .005$).</p>	strong
Barrick et al. 2010 (80)	AM bright light (7-11am) vs PM bright light (4-8pm) vs all day bright light (7am-8pm) vs standard light; 2000-3000lux during BLT hours, 500-600lux in remaining daylight hours over 3 weeks	Agitation	<ul style="list-style-type: none"> • Cluster-unit crossover design • 66 NH/psychiatric unit patients with dementia; North Carolina n = 46, Oregon n = 20 • Not randomised • Rater blinded • No f/u 	CMAI Observation	<p>For people with mild-mod dementia, observed agitation was higher in AM light ($p = .003$), PM light ($p < .001$) and all day light ($p = .001$) conditions compared to standard light. No such differences were found in the severe/v. severe dementia group. Observed agitation also increased as the day progressed, regardless of dementia severity and intervention condition ($p < .001$).</p>	moderate

Burns et al. 2009 (81)	BLT (full spectrum BLT at 10000lux) vs standard light (standard fluorescent tube light at 1000lux) – 2hrs(10am – 12nn) per day x 2 weeks	Agitation ND	<ul style="list-style-type: none"> • RCT • 48 patients with dementia, sleep disruption or agitated behaviour; BLT n = 22, control n = 26 • Randomisation using randomisation lists • Rater blinded • 5 week f/u 	CMAI Actigraphy	<p>No significant effect of BLT on agitation reduction.</p> <p>The BLT group had a greater reduction in amplitude of activity (M10) at week 4 ($p = .004$). Effect on sleep/wake activity not sustained at f/u.</p>	strong
Burns et al. 2011 (82)	Donepezil 5mg/d up-titrated to 10mg/d after a month vs melissa officinalis oil 200mg massaged into the hands and upper arms vs placebo (sunflower oil)	BPSD Psychotic symptoms	<ul style="list-style-type: none"> • RCT • 114 NH/LTC patients with possible/probable AD; donepezil n = 31, Melissa oil n = 32, placebo n = 31 • Block randomisation • Rater blinded • No f/u 	PAS NPI subscales	There were no differences between the three groups in terms of change on the PAS or the NPI total/subscale scores.	moderate
Dowling et al. 2007 (83)	Light therapy (>2500lux in gaze direction) 1hr Monday to Friday for 10 weeks vs usual indoor light (150-200lux)	Aggression Depression ND	<ul style="list-style-type: none"> • RCT • 70 patients with AD; morning light n = 29, afternoon light n = 24, control n = 17 • Permuted block randomisation • Rater blinding not reported 	NPI-NH	<p>NPI-NH scores were reduced on the agitation/aggression ($p = .032$), depression ($p = .042$) and aberrant motor behaviour ($p = .011$) subscales.</p> <p>No significant differences between baseline and post-intervention scores on the NPI-NH night-time behaviour subscale.</p>	moderate
Lin et al. 2007 (84)	Aromatherapy with lavender oil vs placebo (sunflower oil) – 3 weeks intervention and 2 weeks washout, then crossover	Agitation Psychotic symptoms VDB	<ul style="list-style-type: none"> • Crossover RCT • 70 patients with dementia; intervention n = 35, control n = 35 • Block randomisation • Rater blinding not reported • No f/u 	CMAI (Chinese version) NPI (Chinese version)	<p>Total CMAI and NPI scores were reduced after receiving lavender inhalation ($p < .001$), but not after receiving sunflower inhalation ($p > .05$).</p> <p>NPI-agitation ($p < .001$), aberrant motor behaviour ($p = .01$) and night-time behaviour ($p < .001$) subscale scores also decreased with lavender inhalation.</p>	moderate

Minner et al. 2004 (85)	MSS sessions to the total of 324 over 1 year	Apathy	<ul style="list-style-type: none"> • Interrupted time series without parallel control group • 19 NH residents with dementia and difficult behaviours • Participants served as their own controls • Raters not blinded • No f/u 	Positive vocalisation, smile, positive gestures, positive noise expression and positive interactions with people or objects as recorded using an observational checklist developed by first author	Increase in mean number of positive behaviours per resident during and after sessions when compared with before. Statistical significance not reported.	modest
Mitchell 1993 (86)	Aromatherapy with treatment oil vs. control with neutral oil, given 3 x daily over 2 weeks.	Wandering	<ul style="list-style-type: none"> • RCT, crossover with 1 week washout between treatment periods • 12 attendees of day care/residential respite unit • Dementia • Randomisation method not stated • Raters blinded to treatment group 	Weekly ratings determined by staff or carers according to a 3-point scale	Increased agitation and wandering reported in first group during treatment period but reverted to close to baseline levels by endpoint. Second group reported reduced wandering but increased agitation during treatment period. Statistical significance not reported.	modest
Sloane et al. 2007 (87)	High-intensity ambient bright light (2500lux) morning (7-11am) vs evening (4-8pm) vs all-day (7am-8pm) vs standard light; 3 weeks	ND	<ul style="list-style-type: none"> • Cluster-unit crossover study • 66 patients with dementia 	Actigraphy	The morning and all-day light interventions increased the number of hours of night-time sleep ($p < .05$).	moderate
Small-wood et al. 2001 (88)	Three intervention groups: (1) Aromatherapy and massage vs. (2) aromatherapy and conversation vs. (3) massage only. All provided twice weekly, rotated through four periods of the day (10-11am, 11-12noon, 2-3pm and 3-4pm)	Wandering	<ul style="list-style-type: none"> • RCT • 21 inpatients of general hospital ward • Severe dementia • 2 raters blind to condition, and one blind to hypothesis • No f/u 	Behaviour categories of neutral, motor (wandering), self care, receiving care, external, and inappropriate behaviours.	Behaviour assessed using video recordings of 15 minutes immediately following treatment. Each participant received treatment twice in each period of the day over the duration of the trial. No significant overall group difference for all comparisons. Trend for overall reduction in behaviours in group (1). Significant interaction between group and time ($p=.05$) i.e., group (1) showed greater reduction in wandering 3-4pm ($p = .05$).	moderate

Staal et al. 2007 (89)	MSBT for 6 sessions of up to 30min each + standard psychiatric care (i.e., pharmacological therapy, occupational therapy and structured hospital environment) vs standard psychiatric care + structured activity sessions (no time frame reported)	Apathy	<ul style="list-style-type: none"> • Pseudo – RCT • 24 inpatients with moderate to severe dementia and behavioural disturbances in an acute, geriatric, psychiatric unit (16 females); intervention group n = 12, control group n = 12 • Method of randomisation not stated • Apathy raters not blinded • No f/u 	Avolition-apathy, social-emotional withdrawal and affective blunting subscales of the SANS-AD	MSBT group showed significantly greater improvement in apathy than control group when controlling for physical health and age ($p = .04$). No main effect was found for time but time x group interaction effect was significant ($p = .01$).	moderate
van Hoof et al. 2009 (90)	Ambient bright light: 6500K <i>bluish</i> light vs 2700K <i>yellowish</i> light vs traditional dim light (control) over 3 weeks	ND	<ul style="list-style-type: none"> • Repeated measures design • 26 patients • AD, VaD or mixed dementia • Assessed at weeks 20, 24 and 32 • Rater not blinded • No f/u 	GIP	<p>Significant decrease in restless behaviour reported for intervention group after receiving bluish light ($p = .005$) but not yellowish light.</p> <p>It is suggested that bluish light may play a role in improving circadian rhythmicity.</p> <p>Disturbances of consciousness were reduced in the control group ($p = .005$) but not the intervention group receiving bluish light. The change was no longer significant after receiving yellowish light.</p>	moderate

Van Weert et al. 2005 (91)	Individual MSS integrated in 24hr care vs usual care over 18 months	Apathy Anxiety	<ul style="list-style-type: none"> • Clustered pseudo - RCT • 128 residents with dementia from 12 psychogeriatric wards of 6 NHs (61 completers included in both pre- and posttest) • Randomisation at ward level. 4 wards randomised by 'drawing lots' and 2 were assigned. 61 • Participants served as their own controls • Independent observers rated video recordings however, caregiver observations were not blinded • No f/u 	Apathetic behaviours i.e., attentiveness and responsiveness in relation to the environment, others and initiative as measured by the apathy subscale of the GIP	Significant treatment effect for change score on apathetic behaviours in intervention group but not control group ($p < .05$).	moderate
Ward-Smith et al. 2009 (92)	Multisensory stimulation (music, light, touch, massage and aromatherapies) over 3 months	Aggression	<ul style="list-style-type: none"> • Controlled study • 14 SCU residents with dementia • Not randomised • Rater blinding not reported 	Psychotic Behavior Assessment Record	The frequency of behaviours decreased in the intervention group but not in the control group.	modest
Touch therapies						
Gardner et al. 2008 (93)	Craniosacral still point technique 3 weeks baseline, 6 weeks intervention	Aggression	<ul style="list-style-type: none"> • Repeated measures design • 11 LTC residents • Dementia with agitation • 3 week f/u 	M-CMAI	M-CMAI total, physically aggressive, physically non-aggressive and verbal agitated behaviours all decreased during the intervention phase (all $p < .01$) but the effects were only maintained in physically non-aggressive and verbal agitated behaviours post-intervention (both $p < .01$).	moderate
Hawranik et al. 2008 (94)	Therapeutic touch vs simulated therapeutic touch vs control (usual care) – once per day over 5 days	Aggression Agitation VDB	<ul style="list-style-type: none"> • RCT • 51 LTC patients • AD with agitation • 2 week f/u 	CMAI	No differences in the incidence of physically aggressive ($p = .32$) and verbally agitated ($p = .37$) behaviours across the three groups. The TT and the simulated TT groups appear to have lower rates of physically non-aggressive behaviours than the usual care group ($p < .05$). Such difference disappeared at f/u.	moderate

Lin et al. 2009 (95)	Acupressure vs Montessori-based activities vs presence of a visitor – 15mins/d x 6 days/wk over 4 weeks	Aggression Agitation VDB	<ul style="list-style-type: none"> • Crossover RCT • 133 institutionalised patients: acupressure-presence-Montessori n = 42, Montessori-acupressure-presence n = 39 • presence-Montessori-acupressure n = 52 • Dementia with agitation • Double-blinded • No f/u 	CMAI	<p>Post-intervention, CMAI total, physically aggressive and physically non-aggressive scores were lower in acupressure and Montessori groups compared to presence.</p> <p>Neither intervention decreased verbal behaviours.</p>	moderate
Rowe & Alfred 1999 (96)	Effectiveness of Slow-stroke massage in reducing frequency and severity of agitated behaviours	Wandering	<ul style="list-style-type: none"> • Repeated measures design • 14 community dwelling residents and family member or carer • Probable AD • One week f/u 	ABRSSG BSRS	No significant difference within participants between the three phases of the study. Trend towards agitation reduction reported during massage treatment phase.	moderate
Suzuki et al. 2010 (97)	Tactile massage – 30 x 30-min sessions across 6 weeks	Aggression	<ul style="list-style-type: none"> • Controlled study • 40 patients in specialist dementia ward • AD/VaD • No f/u 	BEHAVE-AD	The intervention group experienced significant improvements on the BEHAVE-AD aggressiveness subscale ($p = .048$) whereas no changes were observed in the control group.	moderate
Wang & Hermann (2006) (98)	Healing touch (HT): off the body (Unruffling) and holding the head in a set sequence of steps (Modified Mind Clearance); 10mins per day over 4 weeks	Agitation	<ul style="list-style-type: none"> • Pilot study • 14 SCU patients • Dementia • Not randomised • Rater blinded • No f/u 	CMAI total score	During intervention week, agitation was reduced in the intervention group while it increased in the control group ($p = .001$). Qualitatively, patients report feeling better and more relaxed after receiving HT.	moderate

Woods et al. 2005 (99)	Therapeutic touch delivered 2 x day for 3 days vs <i>placebo touch</i> delivered 2 x day for 3 days vs usual care	Wandering BPSD	<ul style="list-style-type: none"> • RCT • 57 SCU residents within RACF • Moderate to severe AD with BPSD • 3 day f/u 	ABRS Behaviour Monitoring Chart	<p>Nonsignificant trend toward decreased wandering behaviours for intervention group.</p> <p>Significant improvements reported for overall BPSD ($p=.009$), manual manipulation (i.e., restlessness; $p=.02$) and vocalisation ($p=.03$) behaviours in intervention group when compared to placebo and control group.</p>	strong
Woods et al. 2009 (100)	Therapeutic touch vs placebo (mimic treatment) vs control (usual care); twice daily x 3 days	Agitation VDB Wandering	<ul style="list-style-type: none"> • Placebo-controlled RCT • 64 RACF residents • Moderate to severe dementia with agitation • 5-day f/u, results not reported 	BARS mABRS	Restlessness decreased more in the TT group compared to the control group during the 2 nd intervention period ($p = .03$). No other significant differences reported.	strong
Yang et al. (2007) (101)	Acupressure – 15mins x 2 times per day x 5 days per week x 4 weeks, followed by 1 week washout, then crossover to control (companionship and conversation)	Agitation	<ul style="list-style-type: none"> • Repeated measures design • 31 RACF residents • Dementia with agitation • No f/u 	CMAI (Chinese version)	Decline in agitated behaviour greater in the intervention period than in control period ($p < .001$).	moderate
Models of care						
Beck et al. 2002 (102)	ADL, psychosocial activity or combined	VDB	<ul style="list-style-type: none"> • RCT: females randomised (method not stated); males assigned to ensure even distribution • No blinding • 1 and 2 month f/u 	DBS – vocally agitated and vocally aggressive	<p>No reduction in vocal agitation or vocal aggression (statistical significance not reported).</p> <p>Increasing VDB demonstrated at f/u.</p>	moderate

Bedard et al. 2011 (103)	Psychosocial intervention based on comfort, attention and stimulation	VDB	<ul style="list-style-type: none"> • Single group repeated measures design • 26 participants • Raters not blinded • 9 week f/u 	CMAI – swearing, verbal aggression, demands for attention, repetition of phrases, strange noises, screaming, moaning, negativity, verbal sexual advances	Significant reduction in VDB frequency of time spent exhibiting VDB ($p < .001$), duration ($p < .001$) and number (participants exhibiting improvement in duration of VDB; $p < .05$) though not all results maintained at f/u.	moderate
Brodsky et al. 2003 (104)	Psychiatric case management vs psychogeriatric consultation vs standard care control	Depression	No f/u	Various instruments	The entire depressed sample improved over time, but there were no significant differences between the intervention groups.	strong
Brooker et al. 2007 (105)	Multi-level activity-based model of care (Enriched Opportunities Programme)	Depression Anxiety	<ul style="list-style-type: none"> • Repeated measures design • 127 patients • Dementia • No f/u 	CSDD RAID	Levels of depression significantly reduced after intervention ($p = .037$) compared to additional staff phase. No changes were observed in levels of anxiety.	strong
Callahan et al. 2006 (106)	Collaborative care	Depression	<ul style="list-style-type: none"> • RCT • 153 participants: intervention n = 84, augmented usual care n = 69 • AD • 6 month f/u 	NPI CSDD	Lower NPI total was observed at the end of intervention ($p = .01$), and the effect was maintained at the 6-month f/u ($p = .01$). However, no significant group differences were seen in CSDD scores.	strong
Chapman et al. 2007 (107)	Advanced illness care teams (AICT)	Depression	<ul style="list-style-type: none"> • RCT • 118 participants; AICT n = 57, usual care n = 61 • Advanced dementia • No f/u 	CMAI CSDD	<p>Aggressive, physically nonaggressive and verbally agitated behaviours were all reduced across time in both conditions.</p> <p>There was also a greater decrease in physically nonaggressive behaviours in the AICT group.</p> <p>Behavioural disturbances scores on the CSDD were also reduced in both groups across time.</p>	moderate

Chenoweth & Jeon 2007 (108)	Dementia Care Mapping	Depression	<ul style="list-style-type: none"> • Repeated measures design • 35 participants • Dementia • No f/u 	CMAI RMBPC-depression	CMAI was significantly reduced ($p < .01$) but no significant changes were observed in RMBPC-depression scores.	modest
Chenoweth et al. 2009 (109)	Person-centred care vs dementia-care mapping vs usual care	Agitation	<ul style="list-style-type: none"> • RCT • 289 patients • Dementia • Cluster randomisation • Rater blinded • 4 month f/u 	CMAI NPI	At 4-month f/u, patients in the person-centred care and the dementia-care mapping groups had lower levels of agitation relative to the usual care group ($p = .01$ and $p = .04$ respectively), but not immediately post-intervention.	moderate
Cohen-Mansfield et al. 2007 (110)	Treatment Routes for Exploring Agitation (TREA; systematic individualised non-pharmacological intervention based on unmet needs) vs placebo (educational presentation)	Agitation	<ul style="list-style-type: none"> • Placebo-controlled study • 89 NH residents with dementia • Not fully randomised • Rater not blinded • No f/u 	ABMI	The decrease in overall agitation was greater in the intervention group than in the control group ($p = .002$).	moderate
Cohen-Mansfield & Parpura-Gill 2007 (111)	Treatment Routes for Exploring Agitation (TREA)	Agitation	<ul style="list-style-type: none"> • Single case study • Rater blinding not reported • No f/u 	CMAI ABMI	Total agitation, physical agitation, physical aggression were all reduced ($p < .001$), and there was a trend for the reduction of verbal agitation ($p = .08$).	case study
Colombo et al. 2007 (112)	Dementia SCU providing "Gentlecare", a multifaceted, non-pharmacological, prosthetic approach (113) over 8 weeks	Agitation Apathy Psychotic symptoms	<ul style="list-style-type: none"> • Pretest-posttest case series without parallel control group • 214 NH residents with dementia in a SCU (140 females) • Participants served as their own controls • Blinding of raters not stated • No f/u 	Apathy scores at admission and discharge as measured by the NPI	Delusions and hallucinations were reduced at discharge (both $p < .001$). Highly significant reduction in apathy on discharge when compared with admission scores ($p < 0.001$).	moderate

Dröes et al. 2004 (114)	Combined support for people with dementia and caregivers vs non-integrated support (regular psychogeriatric day care) over 7 months	Apathy	<ul style="list-style-type: none"> • Pretest-posttest design with control group • 112 day care attendees and their carers (39 female attendees): intervention group n = 73, control group n = 16 • Dementia • No randomisation. Participant groups attending different centres • Raters not blinded • No f/u 	Assessment Scale for Elderly Patients Behaviour Observation Scale for Intramural Psychogeriatrics CSDD	Significant improvement in inactivity ($p \leq 0.05$) and non-social behaviour ($p \leq 0.01$) following integrated family support. Significant positive effect on BPSD (effect size = 0.52) and depressive behaviour (effect size = 0.92).	moderate
Finnema et al. 2005 (115)	Integrated emotion-oriented care in combination with the Dutch Assoc. of NH Care Model-Care plan vs usual care in accordance with the Model-Care plan over 7 months	Apathy	<ul style="list-style-type: none"> • Clustered interrupted time series with control group • 194 residents with dementia from 14 NH (118 females); intervention group n = 67, control group n = 79 • Random assignment of best matched pairs of wards, method not stated • Partial blinding of assessors • No f/u 	Apathetic behaviour and non-social behaviour as measured by the BIP (also known as GIP) (116) and inactivity as measured by the apathy subscale of the Assessment Scale for Elderly Patients (117)	No significant change in inactivity or apathetic and non-social behaviours for emotion-oriented care.	strong
Hoeffler et al. 1997 (118)	Bedside consultation and individualised bath care plan	VDB	<ul style="list-style-type: none"> • Repeated measures design • 10 participants • Raters not blinded • 1-6 month f/u 	RAS-verbal aggression CMAI-verbal agitation	Reduction in verbal aggression ($p < .05$). No reduction in verbal non-aggressive ($p = .57$) and verbal aggressive ($p = .45$).	moderate

Lee et al. 2007 (119)	Institutional respite care over 2 weeks	ND	<ul style="list-style-type: none"> • Prospective case series • 39 patients with dementia • F/u 6 weeks 	Actigraphy	<p>During the respite period, while the carers' sleep quality improved, the patients' took longer to fall asleep ($p = .047$) and had a less stable circadian activity rhythm ($p = .033$) compared to baseline.</p> <p>At f/u, total night-time sleep and the circadian activity rhythm improved compared to the respite period ($p = .006$ and $p < .001$) but total daytime sleep also increased ($p = .04$).</p>	moderate
Schrijne-maekers et al. 2002 (120)	Emotion-oriented care (121) (based on validation (122), reminiscence therapy and sensory stimulation approaches) vs usual care over 12 months	Apathy Anxiety	<ul style="list-style-type: none"> • Clustered pseudo-RCT • 151 residents with cognitive impairment and behavioural problems attending structured day-care units in 16 NHs (136 females) • NHs randomised. Method not stated • Raters not blinded • No f/u 	Apathetic and non-social behaviour subscales of the short version of the GIP	No significant difference between intervention and control groups at baseline, 3 months, 6 months and 12 months for apathetic or non-social behaviours.	strong
Swanson et al. 1993 (123)	Special care unit vs traditional unit (control)	Wandering	<ul style="list-style-type: none"> • Quasi-experimental, pretest-posttest with parallel control group • 22 residents: intervention group $n = 13$ traditional unit $n = 9$ • Dementia • RACF assessors not blinded 	Behaviours recorded on Individual Incident Record daily for one half of the days each month that assessments were undertaken	Reduction in wandering in residents in special care units (significance not reported).	moderate
Talerico et al. 2006 (124)	Personalised care plan during routine care to minimise pain and discomfort	VDB	<ul style="list-style-type: none"> • Single case study • Raters not blinded • No f/u 	Observational only	Observational reduction in verbalisations of pain, no statistics reported.	case study

Volicer et al. 2006 (125)	Continuous activity programming in the presence of a staff member, engaging residents in meaningful structured or unstructured activities over 3 months	Apathy	<ul style="list-style-type: none"> • Pretest-posttest case series without parallel control group • 90 residents from 2 dementia SCU (veterans, predominately male) • No random assignment • No blinding, however observations were completed by staff not involved in activity programming • No f/u 	Social isolation and time spent engaged in activities as recorded for a quality improvement activity and an anonymous staff survey.	<p>Increase in percentage of waking time spent engaged in activities in SCU_B and significant decrease in social isolation in SCU_A post intervention when compared with pre ($p < .01$).</p> <p>Qualitative data suggests increased willingness to participate in activities.</p>	modest
Education/Training						
Buettner & Fitz-simmons et al. 2009 (126)	Health promotion course over 2 years	Depression	<ul style="list-style-type: none"> • Controlled study • 89 community-dwelling elders; intervention n = 56, control n = 33 • AD/VaD/MCI/other • No f/u 	GDS	Significant reduction in depressive symptoms reported in the treatment group ($p < .001$) in contrast to a significant increase in depressive symptoms in the control group ($p < .001$).	moderate
Cheston & Jones 2009 (127)	Psychoeducation and exploratory psychotherapy	Depression Anxiety	<ul style="list-style-type: none"> • Parallel-group, repeated measures design • 18 memory clinic attendees; psychoeducation n = 8, psychotherapy n = 8 • AD / VaD • Single-blinded • No f/u 	CSDD RAID	There were trends towards decreased depression after receiving psychotherapy and increased depression after receiving psychoeducation, but the contrasts were not significant after controlling for covariates.	moderate
Chrzescijanski et al. 2007 (128)	Staff education using the Emotional Responses as Quality Indicators (ERIC) program over 14 days	Aggression	<ul style="list-style-type: none"> • Time series • 43 RACF patients • Dementia 	BAGS Aggression Scale	Following the introduction of the ERIC intervention, the frequency of aggressive behaviours was reduced (from 32.23 to 28.09) but not the intensity (from 18.63 to 18.33). No significant change reported for total aggression.	moderate
Deudon et al. 2009 (129)	Staff education using staff instruction cards with practical advice on how to deal with BPSD	Aggression	<ul style="list-style-type: none"> • RCT • 306 NH residents with dementia • Randomised with NH as unit • Rater blinded 	CMAI	CMAI total, physically and verbally non-aggressive subscales scores significantly decreased in the intervention group ($p < .001$) but not in the control group. No significant changes on the physically and verbally aggressive subscale scores overall.	strong

Fossey et al. 2006 (130)	Staff training and support on delivering person-centred care vs usual care over 12 months	Agitation	<ul style="list-style-type: none"> • Clustered RCT • 346 patients • Dementia • No f/u 	CMAI	No significant differences were found between the groups at 12 months.	strong
McCall-ion et al. 1999 (131)	Family visit education program vs usual care	VDB	<ul style="list-style-type: none"> • RCT • 66 participants with carers • Dementia • Method of randomisation not stated • Raters single-blinded • No f/u 	CMAI-verbal agitation	Significant reduction in verbal agitation reported at 6 months ($p=.005$).	moderate
Testad et al. 2010 (132)	Staff training using the Relation-Related Care program – 2-day seminar + monthly group guidance over 6 months	Agitation	<ul style="list-style-type: none"> • Clustered RCT • 211 NH residents with dementia; intervention n = 113, control n = 98 • NH units randomised, method not reported • Rater blinded • 6-month f/u 	CMAI Restraint use assessed using standardised interview	<p>Post-intervention, proportion of those starting restraints were lower, and proportion stopping restraints were higher in the intervention group [change in restraint use differed between groups ($p = .021$)]. No difference found at 6-month f/u.</p> <p>Significant reduction in CMAI score in intervention group ($p = .017$) but no difference was found in the control group. Change in CMAI score in intervention group significantly greater than in control group ($p = .034$).</p>	strong
Environmental interventions						
Chafetz 1990 (133)	Two-dimensional grid: black tape used on white floor at two glass exit doors	Wandering	<ul style="list-style-type: none"> • Observational study • 30 residents with dementia in special secure unit • Rater blinding not reported • No f/u 	Frequency of door openings as indicated by buzzer when resident opened exit door	Installation of tape grid failed to reduce exiting behaviour.	moderate

Detweiler et al. 2008 (134)	Wander garden over 12 months	Agitation	<ul style="list-style-type: none"> • Observational study • 34 male dementia unit residents with dementia • Rater blinding not reported • No f/u 	Agitation measured using CMAI	Comparisons of CMAI scores before and after the wander garden was built showed a medium effect size. It was also found that the final CMAI scores correlated with total days spent in the wander garden ($p < .05$) and with baseline CMAI scores ($p < .01$).	moderate
Dickinson & McLain-Kark 1998 (135)	Door concealment using combination of closed blind and cloth barrier	Wandering	<ul style="list-style-type: none"> • Observational study • 7 NH residents • Dementia and history of exiting behaviour • Rater blinding not reported • No f/u 	Observers recorded daily counts of exiting attempts for each resident 2- 4pm	First test condition with closed blind as visual barrier failed to reduce exiting. Significant reduction in exiting reported for cloth barrier ($p < .001$) as well as combined blind and cloth barrier ($p < .01$).	modest
Donat 1984 (136)	Placing a mirror in the female resident's own room	wandering	<ul style="list-style-type: none"> • Single case study • Residential care • No f/u 	Observations	Reduction in intrusions into others' rooms from approximately 16 per hour to 2 per hour.	case study
Hewawasam 1996 (137)	Black insulation tape in 2 different grid configurations over 7 weeks	Wandering	<ul style="list-style-type: none"> • Repeated measures • 10 patients • Hospital ward for the elderly • Dementia 	Observations	Percentage of exit door contacts reduced by 97% in 4 of 10 patients.	modest
Hussian & Brown 1987 (138)	Two-dimensional grid patterns using black tape in a variety of vertical and horizontal configurations	Wandering	<ul style="list-style-type: none"> • Observational study • 8 male mental health hospital • Dementia • Rater blinding not reported • No f/u 	Observers recorded patients crossing grid pattern during free ambulation	The addition of horizontal grids of tape placed on the floor reduced exit door contact to 42% compared to 82% at baseline.	moderate
eLantz et al. 2007 (139)	Combined intervention including antibiotics, pain management; dental care; re-arranging furniture and Citalopram	VDB	<ul style="list-style-type: none"> • Single case study • No f/u • Raters not blinded 	Observation	Reduction in screaming and calling out reported. No statistical significance reported.	case study
Mayer & Darby 1991 (140)	Full length mirror placed in front of exit door vs mirror reversed vs no mirror	Wandering	<ul style="list-style-type: none"> • Observational study • 9 hospital patients • Severe dementia 	Observation during free wandering	Significantly reduced contact with exit reported for mirror when compared to no mirror ($p < .02$). Nonsignificant effect reported for reversed mirror.	modest

Namazi et al. 1989 (141)	Seven different types of visual barriers, each tested over 2 weeks	Wandering	<ul style="list-style-type: none"> • Observational study • 9 dementia unit residents • AD 	Observation	Concealment of the door knob behind a cloth panel reportedly most successful visual barrier for reducing total number of exits through an emergency door	modest
Multicomponent interventions						
Bird & Blair 2010 (142)	Psycho-education, distraction, problem solving, cataract surgery and pain management Behavioural intervention and pain management Pain management and pleasant social contact	Anxiety	<ul style="list-style-type: none"> • 3 case reports • Moderate dementia with anxiety, moderate dementia with depression and severe dementia with agitation, disinhibition and disruptive vocalisations • No f/u 	Observation of behavioural frequency	BPSD reduced in all three cases upon introduction of the interventions	case series
Burgener et al. 2008 (143)	Multimodal intervention including exercise, CBT and support group	Depression	<ul style="list-style-type: none"> • RCT • 43 patients • Early to early-middle stage dementia • No f/u 	GDS	No significant difference in levels of depression reported between intervention and control groups at 20 weeks.	moderate
Martin et al. 2007 (144)	Multicomponent intervention (increased outdoor bright light exposure, efforts to keep residents out of bed during daytime, structured physical activity, introduction of a bedtime routine and efforts to reduce night-time light and noise) vs usual care over 5 days	ND	<ul style="list-style-type: none"> • RCT • 100 NH residents • Majority with dementia • Rater not blinded 	Wrist actigraphy	The intervention group spent less time in bed in daytime compared to the control group ($p < .001$). The intervention group also had an increased duration of the active period while the control group showed a decrease ($p = .022$). Lastly, the intervention group showed a phase advance whereas the control group showed a phase delay ($p = .022$).	strong

McCurry et al. 2005, McCurry et al. 2006 (145, 146)	NITE-AD program including sleep hygiene education, daily walking and increased light exposure program vs caregiver contact; 6 weeks	Depression ND	<ul style="list-style-type: none"> • RCT • 36 persons with dementia living at home with carers • AD with sleep disturbance • Single-blinded • 4-month f/u 	Actigraphy ESS RMBPC	<p>The NITE-AD group showed greater improvements in terms of time awake at night, number of night-time awakenings, number of wakes per hour and duration of night awakenings relative to the control group ($p = .03$, $p = .01$, $p = .03$ and $p = .04$ respectively).</p> <p>There were lower levels of depression on the RMBPC but not on the CSDD. Effects maintained at f/u.</p>	strong
McCurry et al. 2011 (147)	NITE-AD vs walking only vs light only vs control	ND	<ul style="list-style-type: none"> • RCT • 132 community-dwelling participants: walking n = 21 light n = 34 NITE-AD n = 33 carer contact control n = 33 • AD with sleep disturbance • Single-blinded • 4 month f/u 	Actigraphy SDI	<p>Both light only and NITE-AD decreased total wake time at 2 months ($p = .04$ and $p = .01$), and the effects were maintained at 4-month f/u.</p> <p>Sleep percentage also improved in the NITE-AD group ($p = .02$) with effects maintained at f/u.</p>	strong
Ouslander et al. 2006 (148)	Multicomponent intervention (physical activity, attempts to keep subjects out of bed during daytime, evening bright light exposure, consistent bedtime routine, night-time care routines to minimise sleep disruption and strategies to reduce night-time noise) vs control (delayed intervention); 17 days	ND	<ul style="list-style-type: none"> • Controlled study • 160 NH residents • Majority with dementia • Rater blinded 	Wrist actigraphy	<p>Greater decrease in percentage of daytime behavioural observations, at which residents were found asleep, reported in the intervention group compared to the control group ($p < .001$). No significant changes in actigraphic measures reported.</p>	moderate

Weber et al. 2009 (149)	Psycho-therapeutic day hospital program combining music, movement, psychodynamic therapy and sociotherapy	Anxiety Apathy Psychotic symptoms BPSD	<ul style="list-style-type: none"> • Repeated measures design • 76 community-dwelling elders • Mild to moderate dementia with BPSD • No f/u 	NPI	Significant decrease reported across different time points on subscale scores for anxiety ($p = 0.001$) and apathy ($p = 0.019$) as well as NPI total scores ($p < 0.001$).	moderate
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Notes: **NH:** nursing home; **RCT:** randomised controlled trial; **f/u:** follow up; **AD:** Alzheimer's disease; **CMAI:** Cohen-Mansfield Agitation Inventory; **BPSD:** behavioural and psychological symptoms of dementia; **GDS:** Geriatric Depression Scale; **VDB:** verbally disruptive behaviour; **ABMI:** Agitated Behaviour Mapping Instrument ; **ND:** nocturnal disruption; **PDS:** Passivity in Dementia Scale; **SCU:** special care unit; **OT:** occupational therapy; **CSDD:** Cornell Scale for Depression in Dementia; **M-CMAI:** modified-Cohen-Mansfield Agitation Inventory ; **CRAI:** Copper Ridge Activities Index; **LTC:** long-term care; **RAID:** Rating for Anxiety in Dementia; **HAM-D:** Hamilton Rating Scale for Depression; **VaD:** vascular dementia; **AMS:** Alzheimer's Mood Scale; **MOSES:** Multidimensional Observation Scale for Elderly Subjects; **PAS:** Pittsburgh Agitation Scale; **RACF:** residential aged care facility; **LPRS:** London Psychogeriatric Rating Scale; **PCGAAR:** Philadelphia Geriatric Center Apparent Affect Rating Scale; **MDS-NH:** minimum data set for nursing home; **DMAS:** Dementia Mood Assessment Scale; **OAS:** Observed Affect Scale; **MMSE:** Mini-Mental State Examination; **DSM-IV:** Diagnostic and Statistical Manual of Mental Disorders version IV; **CMAI-SF:** Cohen-Mansfield Agitation Inventory- Short Form; **DCM:** Dementia Care Mapping; **MT:** music therapy; **BEHAVE-AD:** Behavioural Pathology in Alzheimer's Disease; **MSS:** Multi-Sensory Stimulation; **BRS:** Behaviour Rating Scale; **BMD:** Behaviour and Mood Disturbance Scale; **GIP/BIP:** Gedragsobservatieschaal voor de Intramurale Psychogeriatric [Dutch Behavior Rating Scale for Psychogeriatric Inpatients]; **BLT:** bright light therapy; **MSBT:** multi sensory behaviour therapy; **SANS-AD:** Scale for the Assessment of Negative Symptoms in Alzheimer's Disease; **ABRSSG:** Agitated Behaviour Rating Scale Scoring Guide; **BSRS:** Brief non-cognitive Symptom Rating Scale; **ABRS:** Agitated Behaviour Rating Scale; **BARS:** Brief Agitation Rating Scale; **mABRS:** modified Agitated Behaviour Rating Scale; **ADL:** activities of daily living; **DBS:** deep brain stimulation; **RAS:** Ryden Aggression Scale; **MCI:** mild cognitive impairment; **NITE-AD:** Nighttime Insomnia Treatment and Education for Alzheimer's Disease; **ESS:** Epworth Sleepiness Scale; **RMBPC:** Revised Memory and Behaviour Problems Checklist; **SDI:** Sleep Disorders Inventory.

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