



Literature Search: Non-Pharmacological Dementia Practice-Related Research

Author	Year	Setting	Participants	Study Design	Results	Notes
Behavioral Therapy						
Allen-Burge et al	1999			Literature review on behavioral intervention research to decrease dementia related challenging behaviors in nursing homes	Separate discussions of behavioral excesses (disruptive vocalization, wandering, physical and verbal aggression) and deficits (excess dependency, therapeutic activities, social interaction/communication).	
Lichtenberg et al	2005	Community-care center	20 elders with AD or related dementia diagnoses	A randomized controlled trial Intervention: A trained nursing assistant implemented the behavioral treatment three times per week for 20 to 30 min each session. The intervention lasted for 3 months.	The behavioral treatment group demonstrated reduced severity in behavioral disturbance in terms of being troublesome to caregivers or dangerous to residents. Both the behavioral treatment and the usual care groups demonstrated a reduced frequency of behavioral disturbance overall.	

McCurry et al	2004	Community	3 participants with dementia	A pre- and post-test design (3 cases reported) Intervention: six in-home treatment sessions over a 2-month period with a geropsychologist experienced in behavioral interventions for dementia patients and family caregivers. Sleep hygiene educational materials were distributed and reviewed in Session 1, and caregivers identified any environmental, dietary, or sleep habit changes that they wished to implement.	Post-test actigraphic improvements in sleep quantity and sleep efficiency, number of nighttime awakenings, and amount of daytime sleep, as well as subjective sleep ratings were observed. One subject maintained improvements at 6-month follow-up.	
Spira & Edelstein	2006			Literature review on behavioral interventions to reduce agitation in older adults with dementia.	23 articles that met inclusion criteria. These articles described interventions that targeted wandering, disruptive vocalization, physical aggression, other agitated behaviors and a combination of these behaviors.	
Blended Therapy						
Arkin	2007	Clinic	24 residents with mild to moderate AD	Intervention: Socialization experiences consisted of supervised volunteer work and cultural/recreational activities.	Cohorts completing 4 semesters or longer showed no significant between-year changes after their first year on the Clinical Dementia Rating,	Psychosocial therapy + communication & language
Ayalon et al	2006			Systematic review on the usefulness of nonpharmacological	Three randomized controlled trials (RCTs) and 6 single-case designs (SCDs;	Behavioral therapy + Psychosocial therapy

				interventions in the management of neuropsychiatric symptoms (NPS) of dementia	N of 1 trials) met inclusion criteria.	
Baillon et al	2004	Nursing home	20 patients with dementia with significant agitated behaviors	Crossover randomized controlled study Intervention: Snoezelen on the mood and behavior of patients with dementia, in comparison to the effect of an established and accepted intervention, reminiscence therapy.	Both interventions had a positive effect. Snoezelen was no more beneficial than reminiscence in terms of effecting a significant reduction in agitated behavior or heart rate.	Environment modification + cognitive stimulation
Bakke et al	1994	Nursing home	1 patient with probably AD	An ABAB reversal design Intervention: was based on information from the Functional Analysis Interview Form. Staff responded to agitated behavior with reassurance and redirection and accompanied participant	The multicomponent intervention based on hypotheses derived from interviews, observations, and experimental probes decreased agitated behavior while maintaining work rate in a man with probable AD.	Practice & education + behavioral therapy
Bakker et al	2011a	Psychiatric-skilled nursing home in the Netherlands	168 patients with dementia and other cognitive disorders	Randomized controlled trial Intervention: Integrative reactivation and rehabilitation (IRR) consisted of a person-oriented integrative psychotherapeutic nursing home program to reduce MNPS of the patient and CB. Control consisted of different types of nursing home care at home or in an institution, mostly emotion oriented	In the short term from the perspective of the caregiver, IRR showed up to 34% surplus effects on MNPS of the patients, lower NPI symptoms, and lower NPI sum- severity. In follow-up, the effects were sustained.	Practice & education + Psychosocial therapy

Beattie et al	2004	Nursing home	3 residents with probable AD	Multiple case design Intervention: a behavioral nursing intervention on the mealtime behavior of nursing home residents with probable AD	All cases were able to sit at the table longer and eat more food during the intervention, while body weight for all cases remained stable throughout the study. Two of the three cases left the table fewer times during the intervention. There were no statistically significant changes in proportion of fluids consumed in any case.	Practice & education + behavioral therapy
Beck et al	2002	Nursing home	179 subjects	A randomized controlled trial Intervention: one focusing on activities of daily living (ADL) and the other focusing on psychosocial activity (PSA), and a combination (CB) of the two. The interventions were implemented Monday–Friday for 12 weeks.	Findings indicated significantly more positive affect but not reduced disruptive behaviors in treatment groups compared to control groups.	Behavioral therapy + psychosocial therapy
Bedard et al	2011	Nursing home	26 residents with verbal agitation (VA)	A single-group repeated measures design Intervention: An individualized multicomponent intervention addressing needs for comfort, social interaction and sensory stimulation was applied by a therapist during 30 min sessions during the time of day when VA was most severe	A statistically significant reduction of the duration of VA during the intervention phase relative to other phases of the protocol was found. This effect was limited to the period during which the treatment is being applied.	Behavioral therapy + psychosocial therapy + sensory stimulation
Bergener et al	2008	Nursing home	43 persons with dementia	A repeated-measures randomized design	At 20 weeks, differences between groups were found for mental ability and self-	Physical exercises + cognitive stimulation + psychosocial therapy

				Intervention: a multimodal (Taiji exercises, cognitive-behavioral therapies, support group) intervention for 40 weeks	esteem, with gains in balance being evident. Continued improvement in outcomes was not observed at 40 weeks.	
Berger et al	2004	Clinic	36 patient-carer dyads	Intervention: a combination of caregiver support group and memory training/music therapy	No significant differences between the intervention and control group neither after 6, 12 nor after 24 months treatment	Psychosocial therapy + practice & education + cognitive stimulation + sensory stimulation
Brody & Burns	2011			Literature review on nonpharmacological intervention studies with outcomes relevant to apathy in dementia.	Studies were rated according to quality and categorized into 7 groups: exercise, music, multisensory, animals, special care programming, therapeutic activities and miscellaneous. Despite a lack of methodological rigor, it is apparent that nonpharmacological interventions have the potential to reduce apathy.	
Brontons & Koger	2000	AD care facility	26 participants with AD	Intervention: music therapy and conversational sessions	Music therapy significantly improved performance on both speech content and fluency dimensions of the spontaneous speech subscale of the Western Aphasia Battery (WAB).	Sensory stimulation + communication & language
Brooker & Duce	2000	Day hospital in UK	25 individuals with mild to moderate dementia	A within-subjects design Intervention: 3 types of activity – the first was simple group reminiscence therapy (RT); the second was group	The results indicated that individuals experienced a greater level of relative wellbeing during RT than GA. The level of wellbeing in both RT and GA was significantly	Cognitive stimulation + psychosocial therapy

				activities (GA); and the third was unstructured time (UT)	higher than in UT.	
Buchanan et al	2007			Literature review on interventions targeted on aggressive behaviors	Nonpharmacological interventions for managing aggressive behavior	
Buchanan et al	2011			Literature review on interventions based on behavioral principles may be included as part of rehabilitation efforts	Specific behaviorally oriented interventions that target 5 domains (i.e., cognitive functioning, the social environment, self-care skills, physical activity, and the physical environment)	
Cevascon & Grant	2003	Assisted living	<p>Experiment1: 4 males, 10 females, early to middle stage of AD, can participate in imitative tasks and follow verbal directions</p> <p>Experiment2: 1 male, 11 females, early to middle stage of AD, can participate in imitative tasks and follow verbal directions</p>	<p>A single-group, pre- and post test design</p> <p>Intervention: Experiment1: vocal and instrumental music with movement activities led by therapist using two types of verbal cues (one/two-word vs. constant)</p> <p>Experiment2: 4 conditions – exercise to vocal music, exercise to instrumental music, exercise with instruments to vocal music, and exercise with instruments to instrumental music</p>	<p>Experiment1: continuous cueing/easy treatment resulted in greater participation than the one cue/difficult treatment</p> <p>Experiment2: exercise to instrumental music resulted in significantly higher participation than exercise with instruments to vocal music</p>	Sensory stimulation + physical exercises
Choi et al	2009	Nursing home	20 patients with dementia	Intervention: a music-intervention group, or an usual care group. The music-intervention group received 50 minutes of music intervention 3	The music-intervention group showed significant improvement with regard to agitation, and the total scores of both patients and caregivers	Psychosocial therapy + sensory stimulation

				times per week for 5 consecutive weeks	were lower	
Christofolletti et al	2008	Residential care	54 participants	A six-month longitudinal design Intervention: Group 1 was an interdisciplinary program comprising physiotherapy, occupational therapy and physical education. Group 2 was physiotherapist alone. Group 3 was considered as control.	The results showed benefits on the balance of subjects in both groups 1 and 2, compared with group 3. Univariate analysis indicated some benefits of the interdisciplinary intervention on two specific domains.	Physical exercises + occupational therapy
Cipriani et al	2006	Day-hospital	10 AD patients and 10 MCI patients	Intervention: a computer-based cognitive training	The AD group showed a significant MMSE score improvement. AD patients also showed significant improvement in the areas of verbal production and executive functions. MCI patients significantly improved in behavioral memory	Technological support + cognitive stimulation
Cohen-Mansfield & Werner	1997	Nursing home	32 residents with dementia and manifesting verbally disruptive behaviors	Intervention: (1) Presentation of a videotape of a family member talking to the older person, (2) in vivo social interaction, and (3) use of music.	The behaviors decreased by 56% during the social interaction, 46% during the videotape, 31% during the music, and 16% during the no-intervention.	Psychosocial therapy + technological support + sensory stimulation
Cohen-Mansfield et al	2007	Nursing home	167 elderly nursing home residents with dementia	A placebo-controlled study Interventions were tailored to the individual profiles of agitated participants and then designed to fulfill the need in a	The implementation of personalized, nonpharmacological interventions resulted in statistically significant decreases in overall agitation	Cognitive stimulation + physical exercises + sensory stimulation

				manner that matched the person's cognitive, physical, and sensory abilities, and their lifelong habits and roles.	in the intervention group relative to the control group from baseline to treatment	
Cohen-Mansfield et al	2010	Nursing home	193 residents with dementia	Intervention: engagement of the personal meaning of stimuli, specifically examining work-like stimuli, stimuli based on the person's identity, and gender role-based activities	The meaning of the stimulus impacts engagement was shown by persons with dementia. Interventions that involve objects or tasks with meaning specific to the person with dementia will be more likely to engage that person.	Sensory stimulation + psychosocial therapy + recreational therapy
Collet et al	2010			Literature review on Double Care Demanding patients	Eight intervention trials, including four RCTs, were identified as relevant studies for the purpose of this review. Seven studies, three of which were RCTs, showed beneficial effects of a comprehensive, integrated multidisciplinary approach combining medical, psychiatric and nursing interventions on severe behavioral problems in DCD nursing home patients	
Cott et al	2002	Long-term care facility	90 residents with dementia	A randomized controlled trial Intervention: walk-and-talk group (30 min, 5 times per week for 16 weeks, walking/talking in pairs), talk-only group (30 min, 5 times per week for 16 weeks, talk only in pairs)	Residents who received the walk-and-talk intervention did not demonstrate statistically significant differences in the outcome variables measured posttest when compared with residents who received the talk-only intervention or no intervention	Physical exercises + communication & languages
Cruz et al	2011	Traditional long-	6 residents with	A single-group, pre- and post	A trend toward improvement	Practice & education + sensory

		term care home for older people	moderate-to-severe dementia 6 staff members	test design Intervention: Implementing motor and multisensory stimulation strategies on residents' morning care routines by staff after the provision of group training and individualized assistance Staff participants received eight 60-minute training sessions in the care home, 1 every other week, during 16 weeks	in the residents' levels of communication and involvement in morning care routines	stimulation
Davison et al	2007	Aged person care home in Australia	31 psychogeriatric aged care residents who presented with behavioral symptoms of dementia	Intervention: individualized psychosocial interventions for behavioral symptoms. The specialist psychosocial team consisted of two psychiatric nurses and two clinical psychologists. The duration of the involvement of this team ranged from 47 to 231 days, with a median time of 90 days.	A modest but significant reduction in staff ratings of the severity of aggressive and verbally agitated behavioral symptoms was found, with an associated reduction in their perceptions of the burden of caring for these patients. Reduced behavioral disturbance was associated with a reduction in the requirement for primary care consultations, and all participants were able to continue to reside in mainstream aged care facilities, despite an increase in the severity of dementia.	Practice & education + psychosocial therapy
Eckroth-Bucher & Siberski	2009		32 patients with MCI	Randomized controlled trial Intervention: a format combining traditional and computer-based activities	Statistically significant improvement on Dementia Rating Scale scores occurred patients in treatment	Technological support + physical exercises

				(Integrated Cognitive Stimulation and Training Program), 45 minutes a day, 2 days a week, for 6 weeks.		
Ferrero-Arias et al	2011	Nursing home/day care	146 residents with dementia	A controlled, cross-over, randomized, simple-blind, multicenter clinical trial. Intervention: initial intervention (music and art therapy and psychomotor activity) or initial control (free activities in the day room) and changed over at 4 weeks	A significant difference between intervention and control periods. The difference was very important in the patients with moderated apathy. However, differences were not so important in the patients with severe apathy and there were no differences at all in the nonapathetic patients	Sensory stimulation + physical exercises + recreational therapy
Galante et al	2007	Nursing home	11 patients with AD or MCI	A single blind randomized controlled study Intervention: The specific treatment (a) consisted in a cycle of 12 individual sessions of computer exercises, while the control condition (b) consisted in sessions of semi-structured interviews with patients	A significant performance decline only in the control group at the 9-month follow-up compared to both baseline and the 3-month follow-up.	Technological support + physical exercises + psychosocial therapy
Gerdner et al	2002	Community	237 caregiver/care recipient dyads	A randomized controlled trial Intervention: a psychoeducational nursing intervention that was conceptually grounded in the Progressively Lowered Stress Threshold model (Hall & Buckwalter, 1987). The comparison group received	The Progressively Lowered Stress Threshold intervention had a statistically significant effect on spousal response to memory/behavioral problems for all caregivers and on response to activities of daily living problems for spousal caregivers. In addition, non-spouses in the experimental	Practice & education + psychosocial therapy

				routine information and referrals for case management, community based services, and support groups	group reported a reduction in the frequency of memory/behavioral problems.	
Graessel et al	2011	Nursing home in Germany	98 patients with dementia	A randomized, controlled, single-blind longitudinal trial Intervention: motor stimulation, practice in activities of daily living, and cognitive stimulation (acronym MAKS). It was conducted in groups of ten patients led by two therapists for 2 hours, 6 days a week for 12 months	Cognitive function and the ability to carry out activities of daily living had remained stable in the intervention group but had decreased in the control patients	Occupational therapy + cognitive stimulation + physical exercises
Heyn	2003	Memory Care Residence for persons with AD	1 male, 12 females, with moderate to severe cognitive impairment	A single-group, pre- and post test design Intervention: A multisensory exercise program with 4 components: a focused attention and warm-up session, flexibility and aerobic exercises, a strength training session, and a closure session that focused on relaxation and breathing techniques	Significant improvement of resting heart rate (RHR) A six-month follow-up for cognitive decline showed the Brief Cognitive Rating Scale (BCRS) scores remained stable	Sensory stimulation + physical exercises
Hodgkinson et al	2007			Literature review on interventions of the management of wandering in older adults who reside in an aged care facility	4 categories of interventions were identified: environmental, technology and safety, physical/psychosocial, and caregiving support and education	
Homberg	1997	Geriatric facility	11 residents with severe	A modification of the recurrent	A statistically significant	Physical exercises + sensory

			cognitive impairment	institutional cycle design Intervention: Interpersonal interaction, singing together while walking and touching (e.g., holding hands) among group members and volunteers were other strong components of group activity.	reduction in the frequency of aggression in the 24-hour periods after the walkers group. An average reduction of aggressive events by 30% shown in this small study is important clinically.	stimulation + psychosocial therapy
Huh et al	2008		A 79-year-old woman with dementia with Lewy bodies	Case study Intervention: 32 weekly 1-hour sessions with the patient, 1-hour sessions with the patient's assigned caregiver and regular interactions with the patient's family and medical treatment team	At the closing session caregiver ratings indicated significantly reduced scores on the CMAI and maintenance in ADLs. Caregivers reported enhanced efficacy in treating behaviors and improvement in their relationship with the patient.	Psychosocial therapy + practice & education
Kang et al	2010	Senior welfare center in Korea	38 elders with mild dementia	A quasi-experimental, nonequivalent control group pretest-posttest design Intervention: is composed of cognitive stimulation training, exercise, music, art, and horticultural therapy.	Significant differences were found post-intervention between the two groups in measures of cognitive function, depression levels, and mental-emotional health.	Cognitive stimulation + physical exercises + sensory stimulation + recreational therapy
Kong et al	2009			Systematic review on nonpharmacological interventions for agitation in older adults with dementia	14 studies were included. Sensory interventions were statistically significantly effective in reducing agitation, while social contacts, activities, environmental modification, caregiving training, combination therapy and behavioral therapy were not significantly effective.	

Kovach et al	2006	Nursing home	114 subjects	A double-blinded randomized experiment Intervention: Serial Trial Intervention (STI), an innovative clinical protocol for assessment and management of unmet needs in people with late-stage dementia.	The treatment group had significantly less discomfort than the control group at posttesting and more frequently had behavioral symptoms return to baseline.	
Lancioni et al	2009	Nursing home	3 residents with AD	The 3 studies targeted coffee preparation with 2 women, use of make-up with 2 women, and use of make-up and tea preparation with 3 women.	Verbal instructions presented via technology were effective in helping all participants perform the target activities. The participants also showed mood improvement (ie, increases in indices of happiness) during the activity	Psychosocial therapy + occupational therapy
Ledger & Baker	2007	Nursing home	45 residents with AD	A longitudinal repeated measures design with an experimental and control group Intervention: weekly music therapy	Music therapy participants showed short-term reductions in agitation, there were no significant differences between the groups in the range, frequency, and severity of agitated behaviors manifested over time.	Sensory stimulation + psychosocial therapy
Letts et al	2011			Literature review on interventions designed to modify and maintain perceptual abilities on the occupational performance of people with Alzheimer's disease and related dementias	Preliminary evidence has supported use of visual stimulation and barriers. We found some evidence for the use of auditory stimuli and group therapy that aim to change perceptual abilities.	
Lin et al	2009	Long-term care facility in Taiwan	133 residents with dementia	A double-blinded, randomized (two treatments and one control; three time periods)	After receiving the intervention, the acupuncture and Montessori-based-	Sensory stimulation + physical exercise

				<p>cross-over design</p> <p>Intervention: acupressure-presence-Montessori methods, Montessori methods-acupressure-presence and presence-Montessori methods-acupressure. All treatments were done once a day, 6 days per week, for a 4-week period.</p>	<p>activities groups saw a significant decrease in agitated behaviors, aggressive behaviors, and physically nonaggressive behaviors than the presence group. Additionally, the ease-of-care ratings for the acupressure and Montessori-based-activities groups were significantly better than for the presence group. In terms of apparent affect, positive affect in the Montessori-based-activities group was significantly better than in the presence group.</p>	
Lin et al	2011	Nursing facility	104 participants	<p>An experimental study using repeated measurements</p> <p>Intervention: The experimental group received a total of twelve 30-min group music intervention sessions, conducted twice a week for six consecutive weeks</p>	<p>The experimental group showed better performance at the 6th and 12th sessions, and at 1 month after cessation of the intervention based on reductions in agitated behavior in general, physically non-aggressive behavior, and physically aggressive behavior, while a reduction in verbally aggressive behavior was shown only at the 6th session.</p>	Sensory stimulation + psychosocial therapy
MacKinlay & Trevitt	2010	Aged-care facility	113 older adults with dementia	<p>Focus group</p> <p>Small groups for spiritual reminiscence, to meet weekly over 6 weeks or 6 months</p>	<p>Members of the 6-month groups expressed a desire to continue meeting after the completion of the research project</p> <p>The group sessions also</p>	Spiritual stimulation + cognitive stimulation + psychosocial therapy

					<p>helped individuals to relate to each other in a different way to that experienced in the general milieu of the aged-care facility</p> <p>Recommendation: Nurses work with small group of residents</p>	
Mahendra & Arkin	2003	Community	<p>24 mild to moderate stage AD patients in Elder Rehab program</p> <p>Student Rehab partners</p>	<p>A single-group, pre- and post test design</p> <p>Intervention: Student participants administered one 2–2.5-h exercise plus language stimulation session, and supervised one 1.5–2-h community activity session per week for 10 weeks per semester. A family member supervised 10 weekly exercise sessions.</p>	<p>Long-term cognitive–linguistic interventions can maintain or improve aspects of language performance in very different individuals with a progressive dementia</p>	<p>Cognitive stimulation + communication & language + physical exercises + psychosocial therapy</p>
Mahendra & Arkin	2004	Community	<p>24 mild to moderate stage AD patients in Elder Rehab program</p> <p>Student Rehab partners</p>	<p>A single-group, pre- and post test design</p> <p>Intervention: Volunteers in Partnership and Elder Rehab programs</p>	<p>Significant improvements of AD patients’ physical and psychological conditions. Significant family caregivers’ satisfaction with the intervention.</p>	<p>Cognitive stimulation + communication & language + physical exercises + psychosocial therapy</p>
Mathews et al	2001	Residential care facility	<p>21 residents with dementia</p>	<p>A reversal experimental design</p> <p>Intervention: All exercise sessions, specifically designed by physical therapists for older adults, were lead by an activity aide and consisted of a series of seated exercises accompanied</p>	<p>Results showed increased levels of participation during the experimental condition observations where rhythmic music accompanied the exercise activities.</p>	<p>Sensory stimulation + physical exercise</p>

				with instrumental music		
McCurry et al	2011	Independent community living	132 people with AD and their in-home caregivers.	A randomized controlled trial Intervention: 3 active treatments (walking, light, combination treatment) or contact control and received three or six in-home visits.	Participants in walking, light, and combination treatment had significantly greater improvements in total wake time at posttest than controls.	Physical exercises + sensory stimulation
Nawate et al	2008	Day care rehabilitation services	11 patients with mild to moderate dementia	A pre- and post-study design Intervention: consisted of nine sessions, including an orientation, once a week, 60 minutes each, on the same day of the week, and at the same time of day.	There were significant improvements in the patients' scores for cognitive function and in their behavior, and the improvement in cognitive function continued until four weeks after the intervention.	Cognitive stimulation + psychosocial therapy
Netz et al	2007	Day care	29 elders with dementia	A randomized controlled trial Intervention: Group physical activity vs. social activity, followed by increased intensity physical activity for both groups.	Approximately 60% of the participants performed almost all movements or repetitions in both intervention phases. No improvements were observed following the first phase of physical activity.	Physical exercises + psychosocial therapy
Nolan et al	2001	Nursing home	3 residents with AD	Intervention: photograph and sign on room finding	50% increase in accuracy in finding the room for participants	Cognitive stimulation + environmental modification
Nomura et al	2009	A rural town in Japan	37 elders with early or mild dementia and 31 family caregivers	A community health action research model Intervention: A monthly activity-based program based on cognitive rehabilitation was developed to improve cognitive function.	These programs helped to interpret the symptoms of dementia and to reduce the behavioral problems.	Cognitive stimulation + recreational therapy + psychosocial therapy

Paukert et al	2010	Clinic/ community	9 elders with dementia and their family caregivers	Pilot study Intervention: Peaceful Mind, a cognitive-behavioral intervention for persons with dementia.	Participants and collaterals were satisfied with the intervention and reported that they benefited in terms of anxiety, depression, and collateral distress.	Cognitive stimulation + behavioral therapy
Poon et al	2005	Community in Hong Kong	22 clients with mild dementia or mild cognitive impairments	A randomized controlled trial Intervention: 12 sessions of assessment and cognitive intervention were conducted via videoconferencing or by face-to-face method.	There was significant and comparable cognitive improvement in clients in both treatment arms.	Cognitive stimulation + technological support
Remington	2002	Nursing home	68 resident with dementia	A four group, repeated measures experimental design Intervention: a 10-minute exposure to either calming music, hand massage, or calming music and hand massage simultaneously,	Each of the experimental interventions reduced agitation more than no intervention. The benefit was sustained and increased up to one hour following the intervention. The increase in benefit over time was similar for each intervention group.	Sensory stimulation x 2
Siders et al	2004			Literature review on nonpharmacological interventions used to control negative consequences of wandering	The search yielded 31 articles that met inclusion criteria. These articles were classified into 6 categories: subjective barriers, walk/exercise and other activities, specialized environments, behavioral techniques, music and alarms	
Sobel	2001	Day care	50 subjects with dementia	Intervention: The cognitive exercise in which the subjects participated was the lottery-type game, Bingo; the 20-minute period of stimulation	Cognitive stimulation enhanced performance on the Boston Naming Test and a Word List Recognition Task; physical intervention,	Recreational therapy + physical exercises

				allowed for an average of 100 numbers to be played. The physical intervention was walking, for the more physically able patients, or arm and leg extensions for the less physically able subjects.	however, did not reach statistical significance.	
Stanley et al	2012	Clinic/ community	32 outpatients with mild to moderate dementia	Pilot randomized controlled trial Intervention: Peaceful Mind included up to 12 weekly in-home sessions during the initial 3 months and up to eight brief telephone sessions during months 3–6, involving self-monitoring for anxiety, deep breathing, and optional skills (coping self-statements, behavioral activation, and sleep management).	Feasibility was demonstrated with regard to recruitment, attrition, and treatment characteristics. At 3 months, clinicians rated patients receiving Peaceful Mind as less anxious, and patients rated themselves as having higher quality of life; collaterals reported less distress related to loved ones' anxiety.	Behavioral therapy + practice & education + occupational therapy
Sung et al	2006	Nursing home	36 elders with dementia	A randomized controlled trial Intervention: the experimental group receiving group music with movement intervention twice a week for 4 weeks	Agitated behaviors were significantly reduced in the experimental group following 4 weeks of group music with movement intervention compared to that of the control group	Sensory stimulation + psychosocial therapy
Sung et al	2012	Nursing home	60 elders with dementia	A randomized controlled trial Intervention: The experimental group received a 30-min music intervention using percussion instruments with familiar music in a group setting in mid afternoon twice weekly for	Repeated measures analysis of covariance indicated that older adults who received a group music intervention had a significantly lower anxiety score than those in the control group while controlling for pre-test score and cognitive	Sensory stimulation + psychosocial therapy

				6weeks, whereas the control group received usual care with no music intervention.	level	
Tadaka & Kangawa	2004	Community in Japan	60 elders with dementia	A randomized controlled trial Intervention: the group care program consisting of reminiscence and reality orientation care methods in addition to a routine day-care service once a week for 10 consecutive weeks	On cognitive function, the intervention group exhibited a significant effect immediately after the intervention, but no significant effect was observed after 6 months. On daily activity function, the intervention group exhibited significant effects in disorientation and withdrawal immediately after the intervention and after 6 months.	Cognitive stimulation + psychosocial therapy
Takahashi & Matsushita	2006	Nursing home	43 elderly patients with moderate to severe dementia	A quasi-experiment design Intervention: group music therapy for 2 years	Systolic blood pressure was significantly lower in participants who received music therapy. The music therapy group maintained their physical and mental status during the 2-year period better.	Sensory stimulation + psychosocial therapy
Tappen et al	2000	Nursing home	65 residents with AD	A randomized controlled trial Intervention: Assisted walking and walking combined with conversation were compared to a conversation-only intervention	The conversation component of the combined walking and conversation treatment intervention appears to have improved compliance with the intervention, thereby improving treatment outcome.	Physical exercises + psychosocial therapy + communication & language
Thelander et al	2008	Nursing home in Sweden	8 residents with dementia	Intervention: out door activities in the park during an intervention period of 6 weeks during summer. Activities	The results indicate that activation and rehabilitation in a park environment can be used as a complement to other	Occupational therapy + psychosocial therapy + physical exercises

				consisted of gardening (e.g. watering, weeding, raking, and planting), walks and social activities.	rehabilitation and activation activities to retain or even improve functional capacity of residents with dementia.	
Van de Winckel et al	2004	Psychiatric hospital in Belgium	25 patients with dementia	Randomized controlled trial. Intervention: exercise training for three months, which consisted of daily physical exercises supported by music for 30 min/session. They were compared with a control group, who received an equal amount of attention through daily conversation.	The exercise group showed a significant improvement in cognition.	Physical exercises + psychosocial therapy
Wang et al	2009	Nursing home	1 resident	An exploratory case study approach Intervention: facilitated use of an anticollision power wheelchair that compensated for decreased awareness of, or response time to, environmental obstacles and prevented collisions would allow the participant to safely and more independently access people with whom to socialize.	During driving sessions, changes in affect such as smiling and attempts to socialize were noted. The resident required ongoing prompting to operate the modified power wheelchair.	Occupational therapy + technological support
Wang et al	2009	Care facility in Taiwan	77 participants with dementia	A longitudinal experimental design Intervention: Participants in the intervention group received one reminiscence therapy session weekly for 8 weeks; those in the control group	No significant differences between the intervention and control groups on overall behavioral competence or physical functioning	Cognitive stimulation + psychosocial therapy

				received regular nursing care		
Wang et al	2012			Literature review on longitudinal studies on the effects of leisure activities on cognitive function and dementia.	The association of mental activity with the risk of dementia was robust in observational studies but inconsistent in clinical trials. The protective effect of physical activity on the risk of cognitive decline and dementia has been reported in most observational studies, but has been less evident in interventional studies.	
Wang	2007	Nursing home	102 subjects	A randomized controlled trial based on a two group pre- and post-test design Intervention: structured group reminiscence therapy underwent eight group sessions, one session per week.	The intervention significantly affected cognitive function and affective function	Cognitive stimulation + psychosocial therapy
Wu	2011	Veterans' homes in four districts in central Taiwan	323 residents	A quasi-experimental design Intervention: Group integrative reminiscence was conducted on a one-hour weekly basis over 12 weeks.	Significant improvements of life satisfaction and depression.	Cognitive stimulation + psychosocial therapy
Yao et al	2012	Community	22 AD-caregiver dyads	Pre and post test design Intervention: The dyadic Tai Chi intervention. It emphasizes enhanced communication techniques using positive emotional motivators (PEMs) and sensory assistance through	Unipedal Stance Time (UST) adjusted mean improved from 4.0 to 5.1 (Week 4, $p < .05$) and 5.6 (Week 16, $p < .05$); Timed Up and Go (TUG) improved from 13.2 to 11.6 (Week 4, $p < .05$) and 11.6 (Week 16, $p > .05$)	Physical exercises + communication + Sensory stimulation

				a caregiver partner to enable a person with AD to participate in a Tai Chi exercise intervention.	post intervention. Retaining dementia patients in an exercise intervention remains challenging.	
Zarit et al	2004	Community	23 dyads and 1 person with dementia	Intervention: Memory Club is a 10-session group program designed to provide information about memory loss and resources for coping with it in an emotionally supportive atmosphere for people with dementia and their care partners.	A preliminary evaluation indicated that people with dementia and their care partners rated Memory Club very positively.	Practice & education + psychosocial therapy
Aguirre et al	2012	Community and nursing home in UK	272 participants with dementia	A randomized controlled trial Participants were randomized into two different CST groups per center (group A or B) with both groups receiving 7 weeks of CST.	Cognitive stimulation therapy (CST) improved cognition and quality of life, and the results showed that the benefits of CST were independent of whether people were taking acetylcholinesteraseinhibitor (AChEI) medication. Increasing age was associated with cognitive benefits, as was female gender. Care home residents improved more than community residents on quality of life, but the community sample seemed to benefit more in relation to behavior problems.	
Burkart et al	1998	Psychiatry clinic in Germany	Experiment1: 44 patients with AD and 24 non-demented controls	Experiment1: participants were asked for immediate and delayed free recall of 12	Experiment1: Steep primacy effects were obtained at all delays in controls. By contrast,	

			Experiment2: 19 patients with AD and 21 non-demented controls	<p>schematic drawings of common objects presented at the rate of 10 s/picture.</p> <p>Experiment2: participants were asked for immediate and delayed free picture recall with presentation rates of 10, 5 and 1 s/picture.</p>	<p>primacy effects were significantly impaired in patients with dementia at all delays of recall.</p> <p>Experiment2: primacy effects were significantly impaired in demented patients versus controls.</p>	
Camberg et al	1999	Nursing home	54 residents with a history of agitated or withdrawn behaviors	<p>Latin-Square, double blinded, 3-factor design with restrictive randomization of three treatments</p> <p>Intervention: Simulated Presence is to provide a personalized intervention for persons with moderate to severe cognitive impairment. Through a unique testing process, some of the best loved memories of the person's lifetime are identified and then those memories are introduced to the patient in the format of a telephone conversation using a continuous play audio tape system.</p>	<p>Simulated Presence was equivalent to usual care and superior to placebo for producing a happy facial expression. A positive effect was also documented in nursing staff observation logs for subjects during Simulated Presence phases compared with the placebo phases and usual care phases.</p>	
Chao et al	2008	A nursing home in northern Taipei	10 residents	<p>A qualitative research design</p> <p>Participant observation was used to explore the process of individual reminiscence therapy and identify nursing roles in the process generated.</p>	<p>Stimuli related to participants' past lives were helpful for initiating reminiscence.</p>	
Clare et al	2002	Clinic in UK	12 participants with	A quasi-experimental pretest	Training produced a	

			probable AD	posttest design Intervention: participants were trained in face-name associations using an errorless learning paradigm.	significant group improvement in recall of trained, but not control, items. Gains were largely maintained 6 months later, in the absence of practice	
Clare et al	2003	Clinic in UK	A 66-year-old man with early-stage AD	A single case intervention study Intervention: learning the names of 13 members of his support group using a mnemonic strategy coupled with either expanding rehearsal or repeated presentation, or both, within an errorless learning paradigm	Recall scores improved from a mean of 2.31% at initial baseline to 91.46% following intervention, and gains were largely maintained at follow-up. There was no evidence of any increase in depression, anxiety or caregiver strain during the intervention.	
Clare et al	2010	Clinic	69 individuals with AD or mixed AD and vascular dementia	Single-blind randomized controlled trial Intervention: Eight weekly individual sessions of cognitive rehabilitation (CR) consisting of personalized interventions to address individually relevant goals supported by components addressing practical aids and strategies, techniques for learning new information, practice in maintaining attention and concentration, and techniques for stress management.	CR produced significant improvement in ratings of goal performance and satisfaction. Behavioral changes in the CR group were supported by fMRI data for a subset of participants.	
Crasel	1994			Review on 3 studies implementing mental activity training (MAT)	Cognitive training is an appropriate mean of combatting cognitive aging as	

					well as of providing a method of treatment for illness-related reduced mental performance.	
de Oliverira et al	2010	Community in Brazil	An elderly male with dementia	A pre-post-case study Intervention: An activity board, a calendar, a routine organizer and a software program were used and evaluated by specialists were used for 4 months	Improvements were found in cognitive functioning and daily activities at home.	
Elford et al	2005	Nursing home	5 residents	Case study Intervention: residents engaged in a process of writing their memories by themselves, in a series of booklets containing memory prompts and photographs, over a period of 4 weeks.	The case study revealed three main themes: views on the past; sharing the past; and confidence in writing about the past. The field note analysis indicated the presence of four themes: proof and maintenance of skills; psychological or internal processes; social contact; and pleasure in reminiscence. The writing was seen as cathartic and provided a meaningful purpose, an opportunity to exercise writing skills and memory, and a focus for participants to share key stories with others.	
Haight et al	2006	Assisted-living facility in Northern Ireland	30 people with dementia	A controlled pilot study Intervention: life review/life storybook	Significant change by group, particularly on depression, communication, positive mood, and cognition	
Heun et al	1997	Clinic	19 patients with AD	A quasi-experiment with control	The presentation conditions significantly influenced recall	

				Intervention: elaboration by naming, 4-fold repetition and different inspection times on memory performance. Picture recall was examined using different presentation conditions on 5 consecutive days	performance depending on the diagnosis and on the delay of recall. Naming of pictures did not improve later recall or recognition.	
Hochhalter et al	2007	Assisted living facility	14 residents	Intervention: participants practiced a 7-digit telephone number and engaged in guided social interaction with a trainer during several sessions. Free and cued recalls were assessed 5 minutes after each session and at least 1 day after each session. Week-long retention was also assessed for those who showed day-long retention on 2 consecutive assessments.	Half successfully recalled at least part of the number after a day delay. Most recalled at least part of the number after a 5-minute delay.	
Huang et al	2009	An older persons care facility in Taiwan	12 elderly clients with mild to moderate dementia	Intervention: Eight sessions of reminiscence cooking lessons were conducted-	After treatment, improvements in personal interaction between group members (internal) and social participation (external) were identified.	
Kinsella et al	2007	Clinic in Australia	Study 1: 14 elders with early AD and 14 healthy elders Study 2: 16 elders with early AD and 16 healthy elders	Study 1: prospective remembering (a text-reading task) Study 2: two learning conditions: a spaced-retrieval technique alone or spaced-retrieval combined with elaborated encoding of task.	Study 1: The Alzheimer's disease group were significantly impaired Study 2: The Alzheimer's disease group (63%) demonstrated benefit in prospective remembering in the combined condition as	

					compared to spaced-retrieval alone.	
Kwok et al	2011	Nursing home in Hong Kong	31 adults aged 65 years or older with mild cognitive impairment	A single-blind, randomized controlled trial Intervention: intensive calligraphy training led by a trained research assistant for eight weeks (n = 14) or no calligraphy treatment	A significant interaction effect of time and intervention was detected. The calligraphy group was found to have a prominent increase in CMMSE global score, and scores in the cognitive areas of orientation, attention, and calculation after two months	
Lai et al	2004	Nursing home in Hong Kong	101 subjects	A single-blinded, parallel-groups (one intervention, one comparison, and one no-intervention group) randomized controlled trial Intervention: Specific reminiscence, the highly focused use of triggers that approximate the life history of an individual, and efforts to stimulate recall during conversations	Significant differences were observed in the intervention group when comparing T1 and T0	
Lee et al	2009	Clinic in Korea	13 very mild AD patients and 6 mild AD patients	Intervention: spaced retrieval training (SRT), 24 SRT sessions were given to each participant, every other day for 8 weeks. In each SRT session, the subject was asked to remember a given set of words and then recall them immediately.	Retention spans were significantly increased up to 24 min after SRT in both very mild and mild AD patients, and this improvement was maintained for different sets of target information. Retainable words were also significantly increased after SRT in the very mild AD patients.	
Lin et al	2010	Long-term care	85 residents with	A single evaluator, blind, and	The Edinburgh Feeding	

		facility in Taiwan	dementia	randomized control trial Intervention: three groups: spaced retrieval, Montessori-based activities, and a control group. The invention consisted of three 30–40 min sessions per week, for 8 weeks	Evaluation in Dementia (EdFED) scores and assisted feeding scores for the SR and Montessori-based activity groups were significantly lower than that of the control group.	
Lin et al	2011a	Adult day care center	14 participants	A pre-experimental, one-group pretest-posttest design Intervention: a 10-day therapeutic recreation program	No significant improvements.	
Lin et al	2011b	Dementia special care units in Taiwan	29 residents	An experimental crossover design Intervention: Montessori intervention and routine activities. A two-period crossover design was used, with 15 residents assigned to Montessori intervention sequence I and 14 residents assigned to Montessori intervention sequence II. On each intervention day, residents were given their assigned intervention. Montessori intervention was provided in 30-min sessions once every day, three days per week, for eight weeks. There was a two-week washout period between each intervention.	There was a significant reduction in the Edinburgh Feeding Evaluation in Dementia score for the Montessori intervention period but not for the routine activities period, while the mean differences for the Eating Behavior Scale score, selffeeding frequency and self-feeding time were significantly higher than those of the routine activities period	
McPherson et al	2001	Nursing home in UK	5 residents with severe dementia	An A—B design	For three participants, use of the memory aid did not	

				Intervention: memory aid for each participant with a single brief introductory practice session in which they and a carer were asked to converse while looking at the memory aid, and evaluated the impact of the aids on the proportion of time participants spent on topic in conversation with carers.	increase the proportion of time-spent on-topic. The remaining two participants, however, spent approximately twice as much time on-topic when using the aid as when conversing without it.	
Metitieri et al	2001	Day hospital of AD unit in Italy	74 patients	Retrospective study Intervention: rehabilitation based on formal reality orientation therapy	Treatment group showed higher estimated survival rates than control group on cognitive decline and institutionalization. The relative risks for cognitive decline and institutionalization in the control group compared with treatment group were significantly higher.	
Neal & Barton	2003			Systematic review on randomized controlled trials examining validation therapy as an intervention for dementia	3 studies were identified that met the inclusion criteria. Significant results were found: Validation versus usual care, and Validation versus social contact.	
Niu et al	2010	The military sanatorium in China	32 patients with mild to moderate AD exhibiting marked neuropsychiatric symptoms	A randomized, controlled, rater-blind clinical trial Intervention: a cognitive stimulation therapy, including reality orientation, fluency, overlapping figure, and photo-story learning	Patients receiving cognitive stimulation therapy showed a greater improvement in the Neuropsychiatric Inventory total score and in the Mini Mental State Examination total score compared to control at week 10. Analysis of the individual Neuropsychiatric Inventory	

					domains revealed a statistically significant benefit for cognitive stimulation therapy-treated patients in the areas of apathy and depression/dysphoria	
Orrell et al	2005	Residential homes in UK	35 people with dementia	Intervention: a seven-week twice-weekly study of (cognitive stimulation therapy) CST. The maintenance CST sessions ran in two residential homes using a once a week program of CST over an additional 16 weeks. Two control homes did not receive the maintenance intervention.	There was a continuous, significant improvement in cognitive function (MMSE) for those receiving MCST (CST+maintenance CST sessions) as compared to CST alone or no treatment. There were no effects on quality of life, behavior or communication following maintenance sessions. The initial cognitive improvements following CST were only sustained at follow-up when followed by the program of maintenance CST sessions.	
Quayhagan et al	1995	Community	78 care recipients	A randomized controlled trial Intervention: Active cognitive stimulation training every week	The experimental group improved in cognitive and behavioral performance with treatment, but returned to former level of functioning by the 9 th month	
Schmitter-Edgecombe et al	2008	Clinic	5 individuals with very mild dementia and 4 spouses as coaches	Intervention: 14 group sessions of a group memory notebook. The learning activities packets included a set of goals and in-session activities, as well as homework assignments that assisted the participants in learning to use and incorporate	Modified laboratory memory testing reveals that participants with dementia demonstrate improved posttreatment memory scores because of increased notetaking behavior and more frequent referencing of notes.	

				the memory notebook into their everyday lives.		
Spector et al	2000			Systematic review on reality orientation in dementia	6 were randomized controlled trials meeting the inclusion criteria. The evidence indicates that RO has benefits on both cognition and behavior for dementia sufferers.	
Spector et al	2003		201 elders with dementia	A single-blind, multi-center, randomized controlled trial Intervention: The 14-session program ran twice a week for 45min per session over 7 weeks. Topics included using money, word games, the present day and famous faces.	The intervention group had significantly improved on the Mini-Mental State Examination, the Alzheimer's Disease Assessment Scale Cognition (ADAS [^] Cog) and Quality of Life Alzheimer's Disease scales.	
Teixeira et al	2012			Systematic review on the effects of nonpharmacological interventions in the cognitive functions in older people with mild cognitive impairment (MCI)	Six studies used cognitive intervention, improving memory and one study used physical activity as intervention, improving executive functions	
Woods et al	2005			Systematic review on randomized controlled trials and quasi-randomized trials of reminiscence therapy for dementia	5 trials are included in the review. The results were statistically significant for cognition (at follow-up), mood (at follow-up) and on a measure of general behavioral function (at the end of the intervention period). The improvement on cognition was evident in comparison	

					with both no treatment and social contact control conditions. Care-giver strain showed a significant decrease for care-givers participating in groups with their relative with dementia, and staff knowledge of group members' backgrounds improved significantly.	
Woods et al	2011			Systematic review on randomized controlled trials of cognitive stimulation for dementia which incorporated a measure of cognitive change	15 trials were included in the review. Cognitive stimulation programs benefit cognition in people with mild to moderate dementia over and above any medication effects.	
Yasuda et al	2009		15 individuals with dementia	Intervention: participants watched personalized reminiscence photo videos as well as two types of TV shows: a variety show and a news show.	80% of the subjects (12 out of 15) showed more attention to their personalized reminiscence photo video than to the other two types of TV shows, thus suggesting the effectiveness of personalized reminiscence photo videos for reminiscence intervention	
Communication & Language						
Egan et al	2010			Systematic review on the effectiveness of methods to improve the verbal communication of individuals with AD with their caregivers.	13 studies met all of the inclusion criteria. One technique emerged as potentially effective: the use of memory aids combined with specific caregiver training programs.	
Fritsch et al	2009	Nursing home	Daytime certified nursing	An experimental design	Those in the TS facilities were	Move to Blended

		facility	assistants and activity staff members (all paid by facilities) who had daily contact with residents in the SCUs in the 20 facilities served as subjects.	Intervention: TS Program Intervention. — TimeSlips storytelling groups, involving 10 – 12 residents, met once a week for 1 hr for 10 weeks. TS Trainings. — Interested NH staff volunteered to participate in an intensive workshop and a 9-week on-site training conducted by TS-certified trainers.	more engaged and more alert. In TS facilities, there were more frequent staff – resident interactions, social interactions, and social engagement. Also, staff who participated in the TS program had more positive views of residents with dementia and devalued residents less. There were no differences in staff job satisfaction and burnout among staff in the TS and non-TS facilities.	Communication & language + Practice
Jelicic et al	2012	Clinic	213 participants with mild memory decline	An observer-blinded randomized controlled trial Intervention: The lexical–semantic stimulation (LSS) treatment consisted of focused lexical–semantic rehabilitation exercises. The exercises are focused on the interpretation of written words, sentences, and stories	LSS treatment yielded significant improvements of the MMSE, BNT, VNT, Brief Story Recall, and RAVL delayed recall mean scores. Among secondary outcome measures, only working memory and the speed of a task assessing executive functions (Stroop test) improved after LSS.	
Mahendra et al	2007	Community	13 AD participants	A single-group, pre- and post test design Intervention: Following 18–20 60-second baseline fluency tests of the target category animals, participants engaged in eight sessions of a picture naming and related quiz exercise (study task) that contained 34 words from the target category (exposure	The group achieved a significant improvement in the number of correct answers from the first to their best and to their eighth trial (evidence of explicit learning).	

				words).		
McGilton et al	2009			Systematic review on communication interventions for health care providers delivering care in residential care settings	Of the six studies that met the inclusion criteria (three randomized controlled trials, three quasi-experimental designs), three used a theoretical framework to guide intervention design. Across the six studies, the most commonly used components were (1) cognitive (to teach staff about communication), (2) behavioral (including practice at the bedside), and (3) psychological (involving individualized feedback). Despite the studies' variability in methodological quality, their results indicated that communication interventions have a positive effect on staffs' knowledge and communication skills and on residents' agitation and challenging behaviors.	
Runci et al	1999	Long-term residential care facility in Australia	An elderly Italian woman with dementia	A randomized, alternating-treatments design Intervention: Intervention A was music therapy and interaction with the researcher in English. Intervention B was music therapy and interaction with the same researcher in Italian.	The Italian intervention was found to be significantly more effective in reducing noisemaking than the English intervention.	

Runci et al	2006	Aged-care facility in Australia	3 older Italian-background persons with dementia	An AB design was used, with randomly ordered alternating treatments in the intervention phase Intervention: 20-minute periods sitting and speaking to each participant and the interaction was conducted in either Italian or English. Languages were randomly ordered to days, with four days of interaction in each language.	A significant increase in non-disruptive behaviors and no change in VDB for the language-relevant (Italian) intervention	
Diet Therapy						
Boffelli et al	2004	Special care unit (SCU)	40 elderly demented patients	Intervention: a nutritional program that consisted of modifications of diet composition and quality and consistency of food based on a patient's preferences or ability to chew, swallowing difficulties, and dental status (soft diets). Time spent by nurses for feeding was increased, as was help feeding, ranging from stimulation to supervision to assisted feeding. Environmental modifications were performed to find the most comfortable place for each patient. Finally, nutritional supplements were prescribed for patients whose daily caloric intake was low	Malnutrition is not an irreversible condition in SCUs but can be assessed and treated, as shown in different settings. Body weight can be gained or maintained	
Burgener et al	2008			Systematic review on	34 studies were reviewed in	

				supporting nutritional interventions for persons with early stage dementias	the areas of dietary restriction, antioxidants, and Mediterranean diet with strong support from epidemiological studies found in all three areas.	
Faxén-Irving et al	2002	Community assisted living in France	36 demented residents	Controlled non-randomized study Intervention: received oral liquid supplements (1720 kJ=410 kcal=day) and were given nutritional education.	The weight of the residents in the intervention group significantly increased at follow-up. No apparent positive effect on the cognitive function was seen. The ADL functions appeared to deteriorate in both groups.	
Hines et al	2010			Literature review on interventions of oral liquid nutritional supplements (OLNS) for people with dementia in residential aged care facilities	OLNS may improve the nutritional state of residents with dementia and help prevent weight loss, and there is some suggestion that it may slow the rate of cognitive decline.	
Kamuhuis et al	2011	Clinics in the Netherlands	225 patients with mild AD	A randomized controlled trial Intervention: receive active or control product as a 125 ml daily drink souvenaid®	A significant treatment effect was shown in patients with 'high' baseline adas-cog, but not in patients with 'low' baseline adas-cog. Overall, intake adherence was significantly correlated with adas-cog improvement in the active product group	
Reimer & Keller	2009			Literature review on how mealtime care practices can be made more person-centered.	4 themes identified: providing choices and preferences, supporting independence, showing respect, and promoting social interactions.	

Shatenstein et al	2008	Hospital-based memory and geriatric clinics in Canada	Physically-well, community-dwelling early stage AD patients	A quasi-experimental pre-post intervention design Intervention: clinical dietetics principles to develop and offer tailored dietary strategies to patients and their primary caregivers.	The application of dietary intervention strategies in two intervention group participants were reported; one was deemed successful while the other was considered unsuccessful.	
Young et al	2004	A fully accredited geriatric teaching facility	34 institutionalized seniors with probable AD who ate independently.	Randomized, crossover, nonblinded clinical trial Intervention: Nutrition supplements were provided between breakfast and lunch for 21 consecutive days and compared with 21 consecutive days of habitual intake.	Intake and body weight were enhanced during the intervention. With higher intake as a result of the supplement intervention more likely to occur in individuals demonstrating low aberrant motor problems and low cognitive impairment.	
Environmental Modification						
Burgio et al	1996	Nursing home	16 residents	Intervention: two environmental "white noise" audiotapes for the treatment of verbal agitation in severely demented nursing home residents.	Results indicate a 23% reduction in verbal agitation with this individualized treatment strategy on the nursing units. These results were obtained even though treatment fidelity data showed that the audiotapes were used during only 51% of the observations.	
Chong et al	2006	Clinic	39 community-dwelling elderly patients with mild-moderate probable AD with sleep-disordered breathing (SDB)	A randomized, double-blind, placebo-controlled trial Intervention: 6 weeks of therapeutic continuous positive airway pressure (CPAP) or 3	Within the therapeutic CPAP group, ESS scores were significantly reduced from baseline to after 3 weeks of treatment and to after 6 weeks of treatment. In the sham	

				weeks of sham CPAP followed by 3 weeks of therapeutic CPAP	CPAP group, there was no significant difference after 3 weeks of sham CPAP but a significant decrease after 3 weeks of therapeutic CPAP.	
Fleming & Purandare	2010			Literature review on evaluating an intervention utilizing the physical environment	57 articles were identified as being sufficiently strong to be reviewed. Designers may confidently use unobtrusive safety measures; vary ambience, size and shape of spaces; provide single rooms; maximize visual access; and control levels of stimulation. There is less agreement on the usefulness of signage, homelikeness, provision for engagement in ordinary activities, small size and the provision of outside space.	
Gil-Ruiz et al	2012	Nursing home	An 85-year-old woman with probable Lewy body dementia	Case report Intervention: utilize her ability to perform hygiene routines when using a hand mirror.	Resident's 'mirror sign' delusion was no longer present	
Gitlin et al	2011	Community	171 families of dementia patients	A randomized controlled trial Intervention: 5 90-min home visits by occupational therapists who provided education and physical and social environmental modifications.	Intervention caregivers reported fewer declines in patients' instrumental activities of daily and less decline in self-care and fewer behavior problems in patients at 3 months post-test.	
Nolan & Mathews	2004	A special care unit	35 residents	Observational study	Results showed reductions from baseline to the	

				Intervention: provide residents continuous access to information about common mealtime questions for 5 months	intervention phase in food-related questions or requests.	
Padilla	2001			Systematic review on the efficacy of environment-based interventions on the affect, behavior, and performance of people with Alzheimer's disease and related dementias	Thirty-three reports met inclusion criteria. Results suggest that ambient music, aromatherapy, and Snoezelen are modestly effective in reducing agitation but do not consistently have long-term effects. Visually complex environments that give the illusion of barriers deter people from wandering to unsafe places but do not reduce the urge to wander. Evidence that bright light therapy can aid in regulating mood and the sleep-wake cycle and thus help people remain awake during the day is preliminary. Montessori-based programming can be useful in matching activities to the person's remaining skills.	
Reimer et al	2004	24 long-term care centers and 4 designated assisted living environments in an urban center in western Canada	185 residents with Global Deterioration Scores of 5 or greater	A prospective, matched-group design Intervention: An ecologic model of care that is responsive to the unique interplay of each person and the environment. This model encompasses a vision of long-term care that is more comfortable, more like	The intervening group demonstrated less decline in activities of daily living, more sustained interest in the environment, and less negative effect.	

				home, and offers more choice, meaningful activity, and privacy than traditional settings		
Schwarz et al	2004	A long-term care facility		<p>A pretest, post-test design with mixed methods</p> <p>Intervention: environmental assessment with the Professional Environmental Assessment Protocol (PEAP), behavioral mapping, and focus-group interviews with staff members.</p>	Although behavioral observations indicate that there was more involvement in programmed activities by the residents, the decentralized neighborhood design did not meet all the behavioral expectations due to a lack of appropriate activities, high staff turnover, and family members' resistance to the relocation of their loved ones.	
Occupational Therapy						
Buettner & Fitzmmons2009		Community	89 community-dwelling elders with new diagnoses of dementia or those confirmed in early-stage dementia	<p>A quasi-experimental design</p> <p>Intervention: a 12-week health promotion course for older adults with early- stage dementia</p>	In the independent samples t-test analysis, significant positive change was found from pretest to posttest for the treatment group on cognition and depression. A chi square analysis found several significant positive differences in health behaviors for the treatment group.	
Dopp et al	2011	Community in the Netherlands	<p>45 clusters, stratified by healthcare setting (nursing home, hospital, mental health service)</p> <p>Study population included the professionals included in</p>	<p>A cluster randomized, single-blinded, controlled trial</p> <p>Intervention: two occupational therapists, a manager, and a physician working at Dutch healthcare organizations that deliver community</p>	Results were not reported	

			each cluster and community-dwelling people with dementia and their caregivers	occupational therapy.		
Gitlin et al	2008	Community	60 dyads of patients with dementia and their family caregivers	A randomized controlled trial Intervention: 8-session occupational therapy intervention involved neuropsychological and functional testing from which activities were customized and instruction in use provided to caregivers.	At 4-months, compared to controls, intervention caregivers reported reduced frequency of behaviors, specifically for shadowing and repetitive questioning; greater activity engagement; and ability to keep busy. Also, fewer intervention caregivers reported agitation or argumentation.	
Graff et al	2007	Community	135 couples of patients with mild-to-moderate dementia and their informal caregivers	A randomized controlled trial Intervention: 10 sessions of occupational therapy over 5 weeks	Improvements on patients' Dqol overall and caregivers' Dqol overall was significantly better in the intervention group. This improvement was still significant at 12 weeks.	
Holthe et al	2007	Residential care home in New Zealand	8 residents with moderate dementia	An ethnographic study The occupational patterns of persons with dementia in a care home and how the residents perceived the group activities in which they participated	Two key themes: (1) the occupational patterns of the residents, and (2) the residents' perceptions of the activities offered. In this story residents appeared passive, playing the role of guests in the care home. Residents were dependent on staff to engage in daily occupations	
Lam et al	2010	Social center and old aged home for the elderly in Hong Kong	74 Chinese old persons with dementia	A randomized controlled trial Intervention: a skills training program of an individualized	At 1 month after completion of program, both groups showed an improvement in process skills of the assessment of motor and	

				selection of daily activities; general occupational therapy for control group	process skills. At 4 months post-program, the intervention group showed a further reduction of cornell scale for depression in dementia (CSDD) scores; Apathy improved at 1 month post- training, but deteriorated at 4 months.	
Lee & Kim	2008	Nursing home	23 institutionalized dementia patients who had sleep disturbance and/or agitation	One group repeated measures Indoor gardening	Significant improvement in wake after sleep onset, nap, nocturnal sleep time, and nocturnal sleep efficiency, while sleep onset time, wake- up time, total sleep time did not change after indoor gardening. Agitation and cognition score was significantly improved.	
Physical Exercises						
Aarsland et al	2010			Systematic review on longitudinal studies with operationalized definition of physical activity providing risk for vascular dementia (VaD) in both groups	A total of 24 longitudinal studies, including 1378 patients with VaD, were included in the review. Five studies fulfilled criteria for meta-analysis, including 10,108 non-demented control subjects and 374 individuals with VaD. The meta-analysis demonstrated a significant association between physical exercise and a reduced risk of developing VaD	
Baker et al	2010	Veterans Affairs	Thirty-three adults (17	A randomized controlled	Six months of high-intensity	

		Puget Sound Health Care System clinical research unit.	women) with amnesic mild cognitive impairment ranging in age from 55 to 85 years	clinical trial Intervention: a high-intensity aerobic exercise or stretching control group. The aerobic group exercised under the supervision of a fitness trainer at 75% to 85% of heart rate reserve for 45 to 60 min/d, 4 d/wk for 6 months. The control group carried out supervised stretching activities according to the same schedule but maintained their heart rate at or below 50% of their heart rate reserve.	aerobic exercise had sex-specific effects on cognition, glucose metabolism, and hypothalamic-pituitary-adrenal axis and trophic activity despite comparable gains in cardiorespiratory fitness and body fat reduction.	
Buettner & Ferrario	1997	Nursing home	66 residents with dementia	A randomized controlled trial Intervention: Small activities groups (n=6-8) were established with residents of similar functioning levels. A certified therapeutic recreation specialist with extensive dementia training and experience implemented the program and trained the activities department staff and the nurses aides to assist during the first 10 weeks of the 30 week intervention	The experimental group improved on mental status, level of depression, right and left grip strength, flexibility, and levels of agitated behavior	
Chang et al	2011a	Community	11 elders had to show impairment in at least one area of cognition	A one-group pre-post test pilot study Intervention: a 15-week "Sun-style Tai Chi for Arthritis" program twice a week for 20-	Although no significant difference existed between pre- and post-test performance on all cognition measures, a dose-response relationship was demonstrated between	

				40 minutes per session.	attendance and some cognition measures.	
Chang et al	2011b	Day care center in Taiwan	26 elders with dementia	A single study group with repeated measure design Intervention: The exercise program consisted of stretching and walking exercises five times per week, and leg-weight bearing three times per week for 20–30 min each.	Slight changes in the scores of one-leg-standing, 30 s chair rise, functional reach and get up and go test but were not statistically significant. Results also indicated that scores in the performance of activities of daily living were significantly higher than at baseline and at 4 months post intervention.	
Connell et al	2007	Nursing home	20 residents with dementia	A pilot study for a randomized controlled trial Intervention: daily structured activity program offered outdoors or indoors	The outdoor activity group experienced significant improvements in maximum sleep duration. Both groups showed significant improvements in total sleep minutes. There also was a significant improvement in verbal agitation in the outdoor activity group.	
Edwards et al	2008	Nursing home	36 patients with moderate to severe dementia who	Intervention: a 12-week, 30-minute moderate-intensity group exercise program thrice weekly. The exercises were chair-based and each session consisted of lateral neck stretch, head rotation, anterior-posterior neck stretch, shoulder shrug, shoulder stretch, wrist reach, ballerina stretch, overhead stretch with weights, arm curl, shoulder press, lateral shoulder press, toe taps, leg	At week 3, anxiety was significantly lower immediately after the exercise session when adjusted for level of participation compared with immediately before the exercise session, indicating immediate changes in affect. Anxiety and depression were significantly reduced at week 12, when compared with week 3, indicating long-term effects of	

				thrusts, hamstring stretch, and walking if possible.	the exercise intervention.	
Eggermont & Scherder	2006			Literature review on the effects of planned physical activity programs on mood, sleep and functional ability in people with dementia.	Of the 27 relevant studies, most focused on the effects of an exercise program on affective behavior, although some also examined effects on other behavior such as sleep. The reported studies on the effects on mood show inconsistent findings.	
Eggermont et al	2009	Nursing home in the Netherlands	97 residents with moderate dementia	A randomized controlled trial Intervention: participants assigned to the experimental condition walked for 30 min, 5 days a week, for 6 weeks. To control for personal communication, another group received social visits in the same frequency.	Results indicate that there were no significant time x group interaction effects or any time x group x ApoE4 interaction effects.	
Fan & Chen	2011	Nursing home	68 residents with mild to moderate dementia	A quasi-experimental, pretest-post-test design Intervention: A 12-week yoga training program of three 55-minute sessions a week	Yoga-trained participants had better physical and mental health. The depression state and problem behaviors were significantly reduced.	
Forbes et al	2008			Systematic review on randomized controlled trials in which physical activity programs were compared with usual care for the effect on managing or improving cognition, function, behavior, depression, and mortality in	4 trials met the inclusion criteria. There is insufficient evidence of the effectiveness of physical activity programs in managing or improving cognition, function, behavior, depression, and mortality in people with dementia	

				people with dementia of any type and degree of severity		
Hageman & Thomas	2001	Adult day care center	75 clients with dementia	A pre-test post-test design Intervention: The resistance-training program consisted of six weeks of exercise using Theraband, a brand of elastic resistive band. Each subject completed two to three sessions per week of training	Although postintervention scores reflected improvement on all gait measures, the only statistically significant change observed was in fast-gait time.	
Hauer et al	2012	Outpatient geriatric rehabilitation in Germany	122 people with dementia	Double-blinded, randomized, controlled trial with 3-month intervention and 3-month follow-up Intervention: Supervised, progressive resistance and functional group training for 3 months specifically developed for people with dementia compared with a low-intensity motor placebo activity	Training significantly improved both primary outcomes. Secondary analysis confirmed effects for all strength and functional parameters. Training gains were partly sustained during follow-up.	
Jedrzejewski et al	2007			Literature review on the associations of physical activity with cognitive function and dementia, including prevention, delay, or slowing down of disease progression.	The relative risk of cognitive decline with aging might diminish in individuals who are physically active; however, this has not been definitively demonstrated thus far.	
Kemoun et al	2010	Nursing home in France	31 subjects with dementia	A randomized controlled trial Intervention: a 15-week physical activity program involving three 1-hour sessions	The subjects from the intervention group improved their overall cognitive score. Interactions were also observed between walking	

				per week	parameters and groups; the intervention group significantly improved walking capacities through heightened walking speed, strides length and a reduction in double limb support time.	
Lautenschlager et al	2010			Literature review to give an overview of recent trials of physical activity in patients with MCI or dementia.	Results support the existence of a positive association between physical activity and reduced risk of cognitive impairment. However, this support does not yet translate consistently into clinical trials.	
Liu-Ambrose & Donaldson	2009			Brief review is to examine the evidence regarding resistance training and cognitive benefits.	Resistance training may prevent cognitive decline among seniors via mechanisms involving insulin-like growth factor I and homocysteine.	
Mirolsky-Scala & Kraemer	2009	Long-term care facility	A 85-year-old female with AD	Case study Intervention: The physical therapy fall management program included lower extremity and core therapeutic exercise, balance, gait, and assistive device training, and caregiver instruction in the form of a functional maintenance program (FMP) with focus on activities that activated the implicit memory system while emphasizing aspects of communication that are typically preserved in	After 4 weeks of twelve 30 minute sessions, the patient's Tinetti Assessment Tool score increased from 8/28 to 16/28 and Berg Balance Scale score from 7/56 to 19/56. The number of documented incident reports related to falls decreased from 2 to 0 in a 4-week period of time.	

				patients with dementia		
Nascimento et al	2012	Clinic in Brazil	20 patients with mild to moderate AD	A controlled trial Intervention: the experimental group, composed of 10 women who participated in the six-month exercise program, and the control group, composed of the 10 remaining AD patients who did not take part in an exercise program during the same period.	The control group showed functional and neuropsychiatric deterioration in the comparisons between pre- and post-intervention times and between groups	
Penrose	2005			Literature review on exercise and its effect on cognition in patients with Alzheimer's disease	Minimal change in cognitive functioning following exercise intervention. However, other benefits may be gained from exercise programs, such as decreasing restless behavior and improving sleep and physical status for the AD patient, and a decrease in caregiver isolation and stress when the caregivers participate in an exercise program.	
Politis et al	2004	Clinic	37 patients with dementia	A randomized, controlled, partially masked clinical trial Intervention: 'The geriatrics network kit' or the 'kit' (Experimental intervention). 'One-on-one' (Time and attention control).	There was a significant reduction in NPI apathy scores in both treatment groups. The only significant difference between the two treatment groups was a modest advantage for the control intervention on the CRAI cueing subscale, but not on the other CRAI subscales.	

Roach et al	2011	Long-term care facility	82 residents with mild to severe AD	Randomized, controlled, single-blinded clinical trial Intervention: An activity specific exercise program was compared to a walking program and to an attention control.	Subjects receiving the activity specific exercise program improved in ability to perform transfers, whereas subjects in the other 2 groups declined.	
Rolland et al	2007	Nursing home	134 ambulatory patients with mild to severe AD	Randomized, controlled trial Intervention: Collective exercise program (1 hour, twice weekly of walk, strength, balance, and flexibility training) or routine medical care for 12 months.	ADL mean change from baseline score for exercise program patients showed a slower decline than in patients receiving routine medical care. A significant difference between the groups in favor of the exercise program was observed for 6-meter walking speed at 12 months.	
Rolland et al	2008			Systematic review on Alzheimer's disease and the effect of physical activity.	No RCTs have yet demonstrated that regular physical activity prevents dementia.	
Scherder et al	2005	Nursing home	45 frail, advanced elderly subjects with mild cognitive impairment (MCI)	A randomized controlled trial Intervention: The 'walking' treatment involved self-paced slow walking with an aid. The hand exercises included bending and stretching the fingers, and sliding a wooden club through the hand by moving the fingers. Facial activity consisted of producing seven different facial expressions, an exercise used with rehabilitation following	Although a (nearly) significant improvement in tasks appealing to executive functions was observed in both the walking group and the hand/face group compared to the control group, the results should be interpreted with caution.	

				paralysis of the facial nerve.		
Williams & Tappen	2007	Nursing home	90 residents with AD	<p>Randomized controlled trial</p> <p>Intervention: supervised walking, comprehensive exercise (walking plus strength training, balance, and flexibility exercises), and social conversation (casual rather than therapeutic themes). Interventions were provided 5 days a week and progressed up to 30 minutes per session over 16 weeks.</p>	At posttest, participants receiving comprehensive exercise exhibited higher positive and lower negative affect and mood. The social conversation group exhibited the least positive and most negative mood and affect.	
Williams & Tappen	2008	Nursing home	45 residents with moderate to severe AD	<p>A three-group, repeated-measures design with random assignment to treatment group</p> <p>Intervention: a 16-week program of comprehensive exercise, supervised walking or social conversation.</p>	Depression was reduced in all three groups with some evidence of superior benefit from exercise.	
Yaguez et al	2011	Clinic	27 patients with AD	<p>A randomized controlled trial</p> <p>Intervention: Exercise Group received 6 weeks movement training. Control Group participated in a standard care group, which served as a control intervention</p>	Significant improvements in sustained attention, visual memory and a trend in working memory were found in the Exercise Group compared to Control Group after the 6 weeks training. In addition, after 6 weeks the Control Group deteriorated significantly in attention, while the AD patients who undertook the physical exercise showed a discrete improvement.	

Yu et al	2006			Literature review on the effects of cognition on function and to explore the potential of aerobic exercise for promoting cognitive and functional capacities	Three broad themes were identified: First, global cognition has mainly been used to examine the effect of cognition on function, indicating an assumption that functional decline progresses in a hierarchical manner in AD. Second, specific cognitive domains affect functional decline in different ways. Executive functioning might have more effect on function than does memory. Third, aerobic exercise might promote cognitive and functional capacities in people with AD by modifying neuropathological changes in the brain.	
Yu et al	2011	A retirement community	8 participants with AD	A 1-group repeated measures design Intervention: a 6-month individualized moderate intensity cycling intervention on cardiorespiratory fitness and lower extremity function	The YMCA test showed a significant reduction in heart rate at stage 2, while no significant changes were observed in the shuttle walk and the Short Physical Performance Battery (SPPB) tests.	
Practice & Education						
Baker et al	2006	Nursing home	A 96-year-old nonambulatory woman with a diagnosis of dementia of Alzheimer's type	Observational study Phase 1: setting analysis Phase 2: functional analysis Phase 3: noncontingent reinforcement	The effectiveness of a functional analysis administered by nursing home staff with no previous training in behavioral assessment was demonstrated.	

			A 21-year-old female CNA served as the primary caregiver during all observation sessions		Noncontingent escape was also shown to be an efficient and effective intervention for aggression maintained by escape in an adult with dementia.	
Barractt	2004			Literature review on the practical, day-to-day issues arising from the time that an individual with dementia needs help with eating and drinking.	Evaluations of interventions aimed at increasing body weight demonstrate that weight gain is possible in dementia. Helping people with dementia to overcome problems with eating and drinking poses ethical and emotional problems for carers. Evidence-based practice can be incorporated into routine services for people with dementia and lead to improved nutritional care	
Beer et al	2011	Residential aged care facility in Australia	351 residents with dementia	A cluster-randomized trial Intervention: Flexible education designed to meet the perceived needs of learners was delivered to GPs and care facility staff in intervention groups. The main topics of the educational programs were communication, personal care and activities, positive values, behaviors of concern, pain management, the 3 Ds (dementia, depression and delirium), and effective working between GPs and	Education of GPs or care facility staff did not affect the primary outcome at either 4 weeks or 6 months.	

				staffs.		
Boehm et al	1995	Nursing home	2 residents with dementia	An A-B-A-B design Intervention: education of a behavior change plan and behavior analysis for staff	The patients' disruptive behaviors decreased markedly when the behavioral intervention was implemented. Patients resumed disruptive behaviors when care was provided without the behavioral plan.	
Borbasi et al	2011	Residential aged care facilities (RACFs) in Australia	20 RACFs within a specific health service district	Mixed methods Intervention: The Dementia Outreach Service (DEMOS) is a Nurse Practitioner (NP) led service which aims to assist RACF staff to better manage people with the behavioral and psychological symptoms of dementia (BPSD), while at the same time, building staff capacity.	Increased self-confidence among staff in dealing with residents with dementia; reduced stress among staff; reductions in the instances of difficult behaviors; reduced referrals to acute sector services; high levels of satisfaction among RACF management regarding DEMOS	
Borbasi et al	2010	Nursing home	Dementia outreach services (DEMOS)	Case study 1. Behavioral management intervention 2. Managing resistive behavior 3. Determining and managing triggers	All of the facilities stated they would use DEMOS again and be willing to recommend the service to other facilities. The NP is in the process of developing user-friendly care plans for best practice management of specific behaviors. DEMOS also provides resources to RACFs on issues common to the management of residents with BPSD.	

Brenske et al	2008	Nursing home	6 individuals with dementia	A reversal (ABAB) design Intervention: evaluate the effects of descriptive prompts on participants' presence in the activity room and the effects of low-frequency prompts on engagement with activities.	Providing descriptive prompts increased activity attendance and engagement for all participants.	
Brodsky et al	2003	Nursing home in Australia	86 subjects with dementia	A randomized controlled trial Intervention: The 2 active interventions were designed for delivery over 12 weeks. Managements include: psychogeriatric case management, psychogeriatric consultation, or standard care	All 3 groups improved from pretreatment to posttreatment on depression scales for depression groups and psychosis scales for psychosis groups. Mode of management appeared to make difference in rate or amount of improvement.	
Brooker et al	2011	Extra care housing scheme	293 residents across 10 extra care housing schemes	Cluster randomized trial Intervention: The Enriched Opportunities Program (EOP) is a multi-level intervention focusing on improved quality of life for people with dementia. It encompasses a whole scheme approach including specialist staff role (EOP Locksmith), leadership, staff training, individualized care-work, community liaison and the provision of activities.	The EOP-participating residents rated their quality of life more positively over time. There was also a significant group-time interaction for depressive symptoms. The EOP-participating residents reported a reduction of 25% at both six and 12 months and a 37% reduction at 18 months. EOP residents were less likely to move to a care home or to be admitted to a hospital inpatient bed.	
Burgio et al	2001	Nursing home	64 CNAs and 67 residents	A two-group comparison design Intervention: CNAs were taught to use communication	Trained CNAs talked more, used positive statements more frequently, and tended to increase the number of specific instructions given to	

				skills and memory books during their interactions with residents with moderate cognitive impairments and intact communication abilities. A staff motivational system was used to encourage performance and maintenance of these skills.	residents. Changes in staff behavior did not result in an increase in total time giving care to residents. Maintenance of CNA behavior change was found 2 months after research staff exited the facility.	
Carpac-Claver & Levy-Storms	2007	Skilled nursing facilities and assisted living facilities	14 residents and 13 nurse aides	Qualitative study Mealtime interactions	4 types of affective communication initiated by nurse aides emerged: "personal conversation," "addressing the resident," "checking in," and "emotional support/praise."	
Chang et al	2010	Nursing home in Taiwan	101 residents	An experimental, longitudinal research design Intervention: Nursing home staff had training of the self-care self-efficacy enhancement program (SCSEEP). Activities used in the SCSEEP included performance accomplishment, vicarious experiences and verbal persuasion.	There was a significant positive correlation between life satisfaction and ADL performance, self-esteem and ADL performance as well as levels of ADL performance and motivation in health behavior.	
Chapman & Toseland	2007	Nursing home	118 residents with advanced dementia	A randomized controlled trial Intervention: The advanced illness care teams (AICTs) used a holistic approach that focused on four domains: (1) medical, (2) meaningful activities, (3) psychological, and (4) behavioral	The AICTs were effective in reducing agitated behavior and pain but not depression.	

Chenoweth et al	2009	Urban residential sites	15 care sites with 289 residents	<p>A cluster randomized controlled trial</p> <p>Intervention: Care sites were randomly assigned to person-centered care, dementia-care mapping, or usual care.</p>	<p>Pairwise contrasts revealed that at follow-up, and relative to usual care, Cohen-Mansfield agitation inventory score was lower in sites providing mapping and person-centered care. Compared with usual care, fewer falls were recorded in sites that used mapping but there were more falls with person-centered care.</p>	
Chien & Lee	2011	Dementia care center in Hong Kong	92 Chinese families of a relative with dementia	<p>A randomized controlled trial</p> <p>Intervention: dementia family care program and routine care only</p>	<p>Participants in the family program reported significantly greater improvements in clients' symptoms and institutionalization rates, and caregivers' quality of life and burden</p>	
Chodosh et al	2006	Clinic	232 medical providers	<p>A clinic-level randomized, controlled trial</p> <p>Intervention: a comprehensive care management program for patients with dementia and their nonprofessional caregivers, including 5 educational modules: an overview of the dementia care management program, the role of care managers and the care protocols, recognition and treatment of dementia and depression, recognition and treatment of dementia and delirium, and assessment of capacity for medical decision-</p>	<p>Intervention providers had better knowledge about assessing decision-making capacity than usual-care providers. Intervention providers viewed dementia patients as more difficult to manage in primary care than usual-care providers. There were no other differences in knowledge, attitudes, or care quality perceptions across intervention and usual-care providers.</p>	

				making		
Chrzescijanski et al	2007	Residential aged care in Australia	43 residents and 75 staff	<p>A simple interrupted time series design</p> <p>Intervention: The staff education program was designed to change staff attitudes and perceptions towards their care management of the person with dementia.</p>	<p>A lower frequency of episodes of aggression at least in the short term, following the introduction of the education program.</p>	
Deudon et al	2009	Nursing home in France	306 patients with dementia	<p>A randomized controlled trial</p> <p>Intervention: An 8-week staff education and training program was conducted in the nursing homes</p>	<p>There was a significant decrease in the global CMAI score between baseline and W8 and between baseline and W20 in the intervention group</p> <p>Results of mixed linear models showed that the CMAI global score, the CMAI physically non-aggressive behaviors subscale score and verbally nonaggressive behaviors subscale score significantly decreased in the intervention group</p>	
Diwan & Phillips	2001	Community and nursing home	73 clients with dementia	<p>Intervention: The case management program not only emphasized higher education and relevant experience among its case managers, it also had a strong quality assurance program that included individual and group supervision, clinical supervision, and ongoing staff development workshops. All these activities helped to ensure</p>	<p>Most CM activity focused on service coordination rather than on direct attempts to manage problem behaviors</p>	

				that clients received a fairly uniform and high level of case management service.		
Eloniemi-Sulkava et al	2009	Community	125 Couples with one spouse caring for the other spouse with dementia	A randomized controlled trial Intervention: Intervention couples were provided with a multicomponent intervention program with a family care coordinator, a geriatrician, support groups for caregivers, and individualized services.	At 1.6 years, a larger proportion in the control group than in the intervention group was in long-term institutional care. At 2 years, the difference was no longer statistically significant. Intervention led to reduction in use of community services and expenditures.	
Eloniemi-Sulkava et al	2001	Community care in Finland	100 demented patients	Randomized controlled intervention study with 2-year follow-up Intervention: patients and their caregivers were provided with a 2-year intervention program of systematic, comprehensive support by a dementia family care coordinator.	During the first months, the rate of institutionalization was significantly lower in the intervention group, but the benefit of the intervention decreased with time.	
Enmarker et al	2010			Systematic review on alternative approaches to the management of dementia related aggression	It was found that if the origin of violent actions was the residents' pain, it was possible to minimize it through nursing activities.	
Femia et al	2007	Community	201 persons with dementia	A quasi-experimental design Intervention: adult day service. Caregivers used a 24-hour log on multiple, consecutive days to report on five domains of BPSD.	Results showed a relationship between ADS use and caregivers' report of fewer nighttime sleep-related problems for their PWDs.	

Finnema et al	2005	Psychogeriatric wards in nursing homes in the Netherlands	146 residents with AD, mixed AD and vascular dementia, and dementia syndrome 99 nursing assistances	A multi-site randomized clinical trial Intervention: Integrated emotion-oriented care and usual care.	Positive effects in favor of the integrated emotion-oriented care were found in mild to moderately demented residents on two adaptive tasks: maintaining an emotional balance (less anxiety) and preserving a positive self-image (less dissatisfaction). In the trained group of nursing assistants fewer stress reactions were found only in those who perceived improvement in their emotion-oriented care skills after training.	
Galik et al	2009	Nursing home	7 CNAs	Focus groups Explore facilitators and barriers to engaging cognitively impaired residents in functional activities and exercise	Three themes: (i) knowing what makes them tick and move; (ii) teamwork and utilizing resources; and (iii) barriers to restorative care	
Gitlin et al	2010	Community	272 caregivers and people with dementia	A two-group randomized trial Intervention: Up to 11 home and telephone contacts over 16 weeks by health professionals who identified potential triggers of patient behaviors, including communication and environmental factors and patient undiagnosed medical conditions (by obtaining blood and urine samples) and trained caregivers in strategies to modify triggers and reduce their upset.	At 16 weeks, 67.5% of intervention caregivers reported improvement in targeted problem behavior, and reduced upset with and enhanced confidence managing the behavior. Additionally, intervention caregivers reported less upset with all problem behaviors, less negative communication, less burden, and better well-being.	

Haupt et al	2000	Community	14 patients and their caregiving relatives	<p>A 3-month, expert-based and conceptualized group intervention</p> <p>Intervention: Two groups were established with seven caregiving relatives in each. Both groups were under treatment conditions; there was no control condition. Group meetings lasted for 90 minutes and took place regularly once per week, covering a period of 12 weeks. Two medical doctors trained in psychotherapy and gerontopsychiatry were group experts. In addition, a social worker and an ergotherapist participated in two group meetings.</p>	<p>A significant improvement in agitation and anxiety of the demented patients. The presence of an additional somatic disease in the patients and male gender predicted a less positive outcome of the intervention related to the presence of agitation.</p>	
Hoeffler et al	2006	Nursing home	37 CNAs and 69 residents	<p>A crossover design with randomization</p> <p>Intervention: In one treatment group, CNAs received person-centered training, first with showering for 6 weeks (Time 1) and then with the towel bath for 6 weeks (Time 2). We reversed the treatment order in the other treatment group. Control group CNAs used usual showering procedures without person-centered training.</p>	<p>Compared with the control group, treatment groups significantly improved in the use of gentleness and verbal support and in the perception of ease.</p>	
Huizing et al	2009	Psychogeriatric nursing home	371 nursing home residents	<p>A cluster-randomized trial</p>	<p>No treatment effect on restraint status, restraint</p>	

		wards in Netherlands		Intervention: The educational intervention consisted of an educational program for nursing staff combined with consultation with a nurse specialist (registered nurse (RN) level).	intensity, or multiple restraint use in any of the three postintervention measurements. Furthermore, only small changes occurred in the types of restraints used with residents in the experimental group.	
Jansen et al	2011	Community in the Netherlands	99 pairs of elders with dementia and their primary informal caregivers	A randomized controlled trial Intervention: 12 months of case management by district nurses for both older adults and informal caregivers versus usual care.	Analyses showed no statistically significant and clinically relevant differences over time between the two groups. The process evaluation revealed that intervention fidelity could have been better. Meanwhile, informal caregivers were satisfied with the quality of case management.	
Judge et al	2011	VA health system	93 veterans with dementia and their caregivers	Intervention: a telephone-based care coordination intervention, Partners in Dementia Care (PDC). Essential features of PDC included (a) formal partnerships between Veterans Affairs (VA) medical centers and Alzheimer's Association Chapters; (b) a multidimensional assessment and treatment approach, (c) ongoing monitoring and long-term relationships with families, and (d) a computerized information system to guide service delivery and fidelity	Findings for action steps suggested a primary focus on getting/giving information and action-oriented tasks to access services and programs. Most action steps were assigned and completed by veteran's spouses and the majority were successfully accomplished. On average, families had two contacts per month with care coordinators.	

				monitoring		
Koczy et al	2007	45 nursing homes in Germany	333 residents who were being restrained at the start of the intervention	Cluster-randomized controlled trial Nurses received one 6-hour mandatory training course and were asked to introduce and implement the content of the intervention package in their care homes	A short-term multifactorial intervention significantly reduced the need for physical restraints	
Lee & Moriarty	2005	A residential home in England		Intervention: 3-day training on stress management to create and maintain an effective work environment	The stress management program reduced the care assistants' levels of stress and improved their ability to cope with potentially stressful situations.	
Levy-Storms et al	2011	Nursing home	17 nursing aides 15 residents	Focus groups	4 dialectical themes emerged related to communication strategies: (a) getting to know versus maintaining a protective distance, (b) mutual respect versus disrespect, (c) avoiding versus addressing conflict, and (d) equity versus perceived favoritism	
Levy-Storms	2008			Literature review on contemporary experimental research and to recommend future directions for research interventions on nursing aides' therapeutic communication with older adults who have cognitive impairment and/or dementia in institutional long-term care settings	Some evidence exists to support that nursing aides can improve their therapeutic communication during care.	

Lim	2003	A special dementia care facility in Korea	8 residents with mild cognitive impairment	<p>A quasi-experimental time series design</p> <p>Intervention: The intervention consisted of systematic prompting and social reinforcement to give residents a series of 1-step commands to guide their face-washing, tooth brushing, and hair-combing.</p>	The study showed a significant increase in grooming independence of elders with dementia	
Logsdon et al	2005	Community	153 participant with AD-family caregiver dyads	<p>Intervention: an exercise program uniquely tailored for individuals with AD, conducted by home health professionals: Reducing Disability in Alzheimer's Disease (RDAD). The RDAD program was designed to decrease frailty and physical impairment, reduce functional dependence, and delay institutionalization in community residing individuals with AD</p>	<p>After 3 months, when compared to individuals who received usual medical care, RDAD participants exercised significantly more than control participants. In addition, RDAD participants had fewer days of restricted activity, improved physical function, and fewer depressive symptoms. Two years after the program was completed, RDAD participants still had better physical function, and less institutionalization due to behavioral disturbance</p>	
Magai et al	2002	Nursing home	91 mid- to late-stage dementia patients and their staff caregivers	<p>A randomized controlled trial</p> <p>Intervention: a nonverbal sensitivity group, a behavioral placebo group that received instruction in the cognitive and behavioral aspects of dementia, and a wait-list control. Training consisted of 10 one-hour sessions taught by a clinical psychologist using prepared</p>	<p>Positive affect increased sharply during the first 6 weeks after intervention in the nonverbal group, with the placebo and wait-list controls showing no change. There was also a decline in negative affect across time for all groups.</p>	

				materials.		
Matthews et al	1996	Nursing home	33 residents with dementia	A longitudinal time design consisting of four phases, each covering a period of 4 weeks Intervention: a change from a task-oriented care approach to a client-oriented care approach of nurses	Agitation levels significantly decreased 6 to 8 weeks following the change, whereas more infrequent agitated behaviors significantly increased. Daytime sleep increased initially after the change but then returned to baseline levels after 6 weeks.	
McCurry et al	2012	Adult family home	47 residents with dementia and 37 staff caregivers	Intervention: a Sleep Education Program (SEP), consisting of four training sessions with staff-caregivers to develop and implement individualized resident behavioral sleep plans.	Staff-caregivers learned how to identify sleep scheduling, daily activity, and environmental factors that could contribute to nocturnal disturbances and developed and implemented strategies for modifying these factors. SEP decreased the frequency and disturbance level of target resident nocturnal behaviors and improved actigraphically measured sleep percent and total sleep time over the 6-month follow-up period	
Orrell et al	2007	Residential home in UK	238 residents with dementia	A single blind, multicentre, cluster randomized controlled trial Intervention: 1 hour per week liaison input per home to deliver a personalized intervention package over 20 weeks to meet the unmet needs.	At follow-up the total number of unmet needs was reduced in both the intervention and control groups, but analyzing the groups by clusters there were no significant differences in either unmet needs or quality of life.	
Proctor et al	1999	Nursing and	120 residents with	A randomized controlled trial	Residents in the intervention	

		residential home in UK	dementia	Intervention: Care staff in the intervention homes attended seminars from the hospital outreach team and received weekly visits from a psychiatric nurse to assist in developing care planning skills over 6 months	group had significantly improved scores for depression and for cognitive impairment but not for behavior rating or Barthel index	
Resnick et al	2009	Nursing home	523 nursing assistants from 12 nursing homes	A randomized controlled trial Intervention: A 6-week restorative care educational program (30 minutes weekly) was conducted for nursing assistants.	There was a significant increase in restorative care knowledge in treatment group participants.	
Reuben et al	2010	Community-based physician practices	5 physicians in each practice and their patients aged 75 and older with dementia	Pre-post intervention design Intervention: Adaptation of the Assessing Care of Vulnerable Elders (ACOVE)-2 intervention (screening, efficient collection of clinical data, medical record prompts, patient education and empowerment materials, and physician decision support and education). In addition, physicians faxed referral forms to local Alzheimer's Association chapters, which assessed patients, provided counseling and education, and faxed information back to the physicians.	Based on 47 pre- and 90 postintervention audits, the percentage of quality indicators satisfied rose from 38% to 46%, with significant differences on quality indicators measuring the assessment of functional status, discussion of risks and benefits of antipsychotics, and counseling caregivers	

Robinson et al	2007	Nursing home	388 family members and 384 staff members	<p>A randomized controlled trial</p> <p>Intervention: training sessions on communication and conflict-resolution techniques with two groups at the intervention sites: staff and residents' family members, followed by a joint meeting with facility administrators.</p>	Families, staff, residents, and facility programs in the intervention facilities all demonstrated positive outcomes from program participation. Behavioral symptoms decreased for residents, and facilities implemented more family-focused programs	
Rowe et al	2009	Community	53 dyads (caregivers and persons with dementia)	<p>A pretest–post-test control group repeated-measures design</p> <p>Intervention: a new night monitoring system designed for informal caregivers to use in the home.</p>	The night monitoring system proved a reliable adjunct to assist caregivers in managing nighttime activity.	
Salva et al	2011	AD outpatients and day care centers in Spain	946 AD patients and caregivers	<p>Cluster randomized multi-center study with one-year follow-up</p> <p>Intervention: a teaching and training intervention on health and nutrition program, NutriAlz, directed both to physician and main caregiver, as well as persons affected by Alzheimer's disease or other dementias, including a standardized protocol for feeding and nutrition.</p>	The one-year assessment was completed for 293 patients (65.4%) in the intervention group and 363 patients (72.9%) in the control group (usual care). The annual rate of ADL change and the caregiver's subjective burden was significant. MNA showed a significant improvement, suggesting an effective nutritional behavior.	
Schrijnemaekers et al	2002	Home for the aged	151 residents with cognitive impairment and behavioral problems	<p>A randomized controlled trial</p> <p>Intervention: The intervention offered to the eight intervention</p>	No statistically significant, nor clinically relevant effects in favor of the intervention group on the behavioral outcome	

				homes consisted of three successive elements: clinical lessons, a training program, and supervision meetings, spread over a total period of eight months.	measures.	
Skovdahl et al	2007	Nursing home	20 residents with dementia and their professional caregivers	Intervention: All caregivers (n = 40) in the nursing home were trained in the application of tactile stimulation. A qualified instructor gave the caregivers theoretical as well as practical education in applying tactile stimulation, for a period of 36 hours.	All residents displayed signs of positive feelings and relaxation. The caregivers stated that they felt able to interact with the residents in a more positive way and that they felt they had a warmer relationship with them.	
Sloane et al	2004	Skilled nursing facility	73 residents with agitation during bathing and 37 CNAs who bathed them	A randomized, controlled trial, with a usual-care control group and two experimental groups, with crossover Intervention: One treatment group received the towel bath during the first 6-week intervention period and person-centered showering during the second intervention period. The other treatment group received the same interventions in the reverse order. A clinical nurse specialist or psychologist who worked alongside the CNAs 2 days a week for 4 weeks introduced the interventions	All measures of agitation and aggression declined significantly in both treatment groups. Discomfort scores also declined significantly in both intervention groups. The two interventions did not differ in agitation/aggression reduction, but discomfort was less with the towel bath. Average bath duration increased significantly with person-centered showering but not with the towel bath.	
Suominen et al	2007	Nursing home in Finland	29 professionals	Intervention: The aim of the nutrition education was to facilitate the professionals'	After calculating the diets and discussing with others, professionals felt easier about	

				<p>understanding of aged nursing home residents' nutritional problems and to internalize the aims of good nutritional care. The educational process took place in five nursing homes and lasted for 6 months. The education included six training sessions (each 2–3 h) with lectures, small group discussions, homework tasks and personal feedback.</p>	<p>responding to the nutritional problems of the residents. After 1 year, the residents' mean energy intake had increased 21% from 1230 to 1487 kcal. Before the education none but after 1 year 16% had a good nutritional status according to the MNA.</p>	
Teel & Leenerts	2005	Community	6 spouse caregivers of persons with dementia	<p>A single-group, pre- and post test design</p> <p>Intervention: The Self-Care for Health Promotion in Aging (S-CHPA) model provided the basis for development of an intervention focused on promoting health among older adults who provide care for their spouses with dementia.</p>	<p>Participants reported understanding session content (receipt), and planned to use the information (enactment). Participants also reported an increased awareness about self-care practices and offered specific examples of how they intended to practice better self-care.</p>	
Tesad et al	2005	Nursing home in Norway	4 nursing homes	<p>A randomized single-blind controlled trial</p> <p>Intervention: The intervention consisted of a full day seminar, followed by a one-hour session of guidance per month over six months. The content of the educational program focused on the decision making process in the use of restraint and alternatives to restraint consistent with professional practice and quality care.</p>	<p>After the intervention period, the number of restraints had declined by 54% in the treatment group, and increased by 18% in the control group. The difference between the two groups was statistically significant</p>	

Tesad et al	2010	Nursing home in Norway	4 nursing homes	A randomized controlled trial Intervention: A 2-day educational seminar and monthly group guidance for 6 months	The proportion of residents starting new restraint was lower in the intervention at 6-month evaluation, but not significant at 12-month. The total CMAI score declined from baseline to 6 and 12 months' follow-up in the intervention homes	
van Weert et al	2004	Nursing home in the Netherlands	80 CNAs	A randomized pre-test–post-test control group design Intervention: CNAs used snoezelen in the 24-h care of the residents	The implementation of snoezelen effected a change from task-oriented care to resident-oriented care	
van Weert et al	2006	Nursing home in the Netherlands	120 CNAs and 120 residents with dementia	A quasi-experimental pre- and post-test design Intervention: a 4-day in-house 'snoezelen' training, stimulus preference screening and supervision meetings	A statistically significant increase in 'Positive Person Work' and decrease in 'Malignant Social Psychology' (total scores) after the	
Weitzel et al	2011	Hospital	One hospital	A pre-post observational pilot study Intervention: A unique hospital-wide program to encourage appropriate communication techniques with patients who have dementia was provided to all departments of a hospital	Improvement in some communication techniques	
Wikby et al	2009	Residents home	62 residents	A pre- and posttest, quasi experiment	After 4 months the number of residents assessed as protein energy malnourished	

				Intervention: Staff received education about nutritional needs and individualized nutritional care	decreased. In the experimental group, motor activity and cognitive function increased.	
Wilkes et al	2005	Nursing home in Australia	23 residents with dementia	A simple interrupted time series quasi-experimental design Intervention: persons with dementia were relocated to a special unit.	The most significant results from the study were that the verbally agitated behavior of the subjects was reduced and sustained throughout the 6 months of the study after their move into a SCU.	
Williams & Herman	2011	Nursing home	16 video records	Observational study The study examined videotapes of nursing home residents with dementia interacting with staff during bathing	Highly controlling communication was significantly correlated with increased resident resistiveness to care. Associations between the care and respect dimensions of communication were not significantly correlated with resistiveness to care.	
Williams	2006	Nursing home	Audio records	A single group repeated measures design Intervention: an educational program to improve nursing home staff communication skills and to reduce elderspeak	Immediate post-intervention conversations were rated as less controlling, but more respectful and caring. After 2 months, communication was more controlling, less respectful, and less caring.	
Yury & Fisher	2007	An adult day treatment facility	1 resident	Case study A series of in-services conducted by the authors during staff meetings at the day care facility	Physical aggression, verbal agitation decreased from baseline frequencies. However, verbal sexual advances directed at male clients did increase.	

Psychosocial Therapy						
Bakker et al	2011b	Psychiatric-skilled nursing home in the Netherlands	168 patients with dementia and other cognitive disorders	Randomized controlled trial Intervention: Integrative reactivation and rehabilitation (IRR) consisted of a person-oriented integrative psychotherapeutic nursing home program to reduce MNPS of the patient and CB	In the combined prognostic models Alzheimer dementia showed significant prognostic qualities for improvement on NPI sum severity, IRR on general burden and competence of caregiver.	
Ballard et al	2009	Clinical center in UK	318 patients with AD with clinically significant agitated behavior	Randomized blinded placebo-controlled trial Intervention: an open design with a psychological intervention (brief psychosocial therapy [BPST]) for 4 weeks, preceding randomization to pharmacotherapy. The therapy involved social interaction, personalized music, or removal of environmental triggers.	318 patients with AD completed BPST with a significant improvement. Overall, 43% of participants achieved a 30% improvement in their level of agitation.	
Cheston & Jones	2009	Memory assessment centers or clinics in England	17 participants with dementia	A small scale study that compared the impact of two different forms of group therapeutic interventions on newcomers to those groups. Participants joined an on-going therapy group and received either 10 weeks of exploratory group psychotherapy or group psycho-education.	There was a significant interaction between mode of therapy and levels of depression and a borderline significant interaction between therapy type and levels of anxiety. However, once the low affect level of participants in the psycho-educational groups was controlled for, differences between the interventions were insignificant.	

Cheston et al	2003	Community in England	42 participants with dementia	<p>Randomized controlled trial with baseline and follow-up measures</p> <p>Intervention: The therapeutic issue that participants were asked to discuss was 'what it's like when your memory isn't as good as it used to be'. Participants were encouraged to share their experiences with each other and to discuss the emotional impact of these experiences on them</p>	<p>A statistically significant treatment effect for Cornell depression scores which was maintained at follow-up and a similar reduction in anxiety as measured by the rating for anxiety in dementia which was borderline for significance.</p>	
Cohen-Mansfield et al	2006	Adult day center and nursing home	93 elderly persons with dementia	<p>A randomized controlled trial</p> <p>Intervention: to help participants engage in activities designed to correspond to each participant's most salient self-identity</p>	<p>The treatment group showed a significant increase in interest, pleasure, and involvement in activities, fewer agitated behaviors during treatment, and increased orientation in the treatment period. The experimental treatment had effects that were superior to those of the nonexperimental activities.</p>	
Doyle et al	1997	Long-term care facility	12 patients with severe dementia	<p>Case study</p> <p>Intervention: psychosocial interventions in reducing the frequency of noisemaking, were contingent reinforcement of quiet behavior and environmental stimulation tailored to individual preferences</p>	<p>3 were not observed to be as noisy as reported by staff, and 3 showed a clear reduction in noise during the intervention period, 4 did not show any overall reduction in noisemaking during psychosocial interventions</p>	

Finnema et al	2000			Literature review on intervention studies in various emotion-oriented approaches in the care for people suffering from dementia.	Emotion-oriented care approaches offer the opportunity to tailor the care to the individual needs of dementing elderly and can be complemented with other psychosocial approaches (e.g. psychomotor therapy and music therapy) when necessary.	
Georage & Whitehouse	2010	Assisted living facility	8 persons with dementia	Mixed-method design Intervention: a 5-month structured intergenerational volunteering program could enhance the QOL of persons with mild to moderate dementia.	The initial findings in this pilot study have suggested that, by engaging persons with dementia and providing a meaningful, non-medicalized social space for intergenerational interaction with children, QOL may be enhanced through a variety of biopsychosocial pathways, particularly through stress reduction.	
George	2011	Assisted living facility	15 participants with mild to moderate dementia	A randomized control trial Intervention: hour-long volunteer sessions with a kindergarten class and an older elementary class in alternating weeks over a 5-month interval	Quantitative analysis demonstrated a significant decrease in stress for the intervention group. Qualitative analysis identified three main pathways through which intergenerational volunteering affected QOL: perceived health benefits, sense of purpose and sense of usefulness, and relationships.	
Greer et al	2002	Nursing home	6 females with moderate dementia	An ABACA withdrawal design with counterbalancing across groups	Live cats had the greatest influence on overall average subject performance across all	

				<p>Intervention: In one intervention phase of the study, two toy cats were placed on the table in front of the participants. This intervention phase consisted of three ten-minute sessions. In the second intervention phase of the study, two live cats were placed on the table in front of the participants. This intervention phase consisted of three ten-minute sessions.</p>	<p>three measurements. Closer inspection of individual group performance showed that the live cats had a stronger effect on Group 2 than on Group 1. This is likely due to the fact that live cats were the first intervention for Group 2 and the second intervention for Group 1.</p>	
Ishizaki et al	2002	Day care	34 patients with mild cognitive impairment	<p>A quasi-experiment design</p> <p>Intervention: The experimental group participated in activities in a day-care-like setting once a week over a period of 6 months, whereas the control group did not. Each group was reevaluated after approximately 9 months.</p>	<p>A significant improvement was found for the global clinical measure, the observation scale, and the projective test in the experimental group after the intervention.</p>	
Kasi-Godley & Gatz	2000			<p>Review of 6 psychosocial interventions for individuals with dementia.</p>	<p>Psychodynamic approaches appear helpful for understanding intrapsychic concerns of demented individuals. Support groups and cognitive/behavioral therapy assist early stage individuals to build coping strategies and reduce distress. Reminiscence and life review provide mild to moderate stage individuals with interpersonal connections.</p>	

					Behavioral approaches and memory training target specific cognitive and behavioral impairments and help to optimize remaining abilities. Reality orientation reflects a similar goal, yet is probably more useful for its interpersonal functions.	
Kolanowski & Litaker	2006	Nursing home	30 residents with dementia	A cross-sectional design with repeated measures Intervention: examine the temporal relationship between social interaction (high vs. low) and agitation in persons with dementia by their ranking (high vs. low) on the trait of extraversion.	Agitation was significantly greater under high social interaction as compared with low social interaction regardless of the extraversion score.	
Lantz et al	1997	Nursing home	8 residents with dementia	A quasi-experiment design Intervention: The program focuses on modified meditation, relaxation, guided imagery, and body awareness. The intervention includes groups of 8-10 residents meeting weekly for one hour over a 10-week period, with the flexibility to continue further depending on the needs and interest of the participant population.	There was a statistically significant reduction in agitation, as measured by total CMAI scores, in the intervention group. Overall, there was a trend toward improvement over time in both groups, suggestive of a component of change in staff perception of agitation.	
LeBlanc et al	2006	Adult day care	4 participants	Experiment 1: preference and engagement assessments	For 3 of 4 participants, the vocal modality was optimal, while the tangible modality	

				Experiment2: An intervention was conducted in the common area of the day program in two 1½ -hour blocks each day (prior to and after lunch) to determine if regular, frequent choices would increase participant engagement.	was optimal for the fourth. Moderate to substantial increases in engagement were observed for all participants when structured choices were offered.	
Lee et al	2007	Skilled nursing facility	14 nursing home residents on a dementia special care unit 15 preschool children from the facility's on-site child care center	A single group repeated measures design Intervention: one-to-one intergenerational programming (IGP) using Montessori-based activities served as the interface for interactions between dyads	Taking part in IGP was consistently related with higher levels of positive engagement and lower levels of negative forms of engagement in these residents with dementia than levels seen in standard activities programming on the unit.	
Libin & Cohen-Mansfield	2004	A special care unit of a large, not-for-profit nursing home	9 residents with severe dementia or cognitive impairment	A comparison condition experimental design Intervention: residents received two interactive sessions—one with the robotic cat and one with the plush cat, with duration of 10 minutes each. Only one session per day was conducted for each resident.	Interacting with the cats was linked with decreased agitation and increased pleasure and interest	
Logsdon et al	2007			Literature review on evidence-based psychological treatments (EBTs) for behavioral disturbances in older adults with dementia	14 studies were considered for inclusion as EBTs; of these, 8 showed significant differences between treatment and control groups. Results of this review indicate that behavioral problem solving therapies that identify and modify	

					antecedents and consequences of problem behaviors and increase pleasant events and individualized interventions based on progressively lowered stress threshold models that include problem solving and environmental modification meet EBT criteria.	
Moretti et al	2011	Nursing home in Italy	21 patients with dementia	A quasi-experiment design Intervention: a pet therapy intervention that lasted 6 weeks. The pet activity (90 min, once a week) consisted in bringing dogs in contact with all participants. Cases were required to hold, stroke, walk, talk to and play with the animals, under the supervision of dog educators.	Both the pet group and control group improved on Mini-Mental State Examination (MMSE) and 15-items Geriatric Depression Scale (GDS). Within the pet group, GDS symptoms significantly decreased, whereas mean MMSE score significantly increased. The between group comparison showed a positive effect of pet therapy intervention on GDS. Most of the participants reported an improvement of their perceived quality of life.	
Mossello et al	2011	An Alzheimer Day Care Center in Italy	10 patients	A repeated measures study Intervention: two weeks' pre-intervention, three weeks' control activity with plush dogs (CA), and three weeks' animal-assisted activities (AAA).	Cognition and NPI were unchanged across the study. Declines in the CMAI and CSDD scores after AAA were not significant, while the NPI anxiety item score significantly decreased in comparison with CA. OERS "sadness" decreased, while "pleasure" and "general	

					alertness” increased during AAA, and observed sadness remained lower after three hours. Motor activity increased significantly during AAA.	
Opie et al	1999			Systematic review on non-pharmacological strategies to alleviate behavioral disturbances in elderly persons with dementia	43 studies met criteria for inclusion. Validity ratings were: 1 strong, 15 moderate, and 27 weak. There is evidence to support the efficacy of activity programs, music, behavioral therapy, light therapy, carer education and changes to the physical environment.	Move to Blended Psychosocial therapy + practice & education + sensory stimulation + behavioral therapy
Palo-Bengtsson et al	1998	Nursing home in Sweden	6 persons with dementia	Qualitative design Intervention: social dancing, participants were videotaped during 4 dance sessions	Persons with dementia-retained abilities were prominent in dancing. Social dancing was supportive and seemed to having meaning to both patients and their carers.	
Richards et al	2005	Nursing home	147 residents with dementia	Pretest/posttest randomized with an experimental and control group Intervention: One to 2 hours of individualized social activities for 21 consecutive days.	The intervention group had significantly less daytime sleep and a lower day/night sleep ratio than the control group, after adjusting for baseline values.	
Richeson	2003	Nursing home	15 residents with dementia	A quasi-experimental time-series design Intervention: a daily AAT intervention for three weeks	Statistically significant decreases in agitated behaviors and a statistically significant increase in social interaction pretest to post-test.	

Sellers	2006	Skilled nursing facility	4 elders	An A-B-A-B design Intervention: animal assisted therapy (AAT) on the social and agitated behaviors of elders with dementia residing in long-term care	A statistically reliable difference in the social behavior category and the total agitated behaviors category indicated that the behaviors targeted by the intervention were successfully modified	
Van Mierio et al	2010			Literature review on personal characteristics of people with dementia (living in the community or in an institution) that are related to positive outcomes of psychosocial interventions	For people with dementia living in the community positive effects were most frequently found in the persons with mild to severe dementia not otherwise specified and with mild to moderate Alzheimer's Disease. For people with dementia living in an institution positive effects were found most frequently in the subgroups moderate to severe dementia, severe to very severe dementia and in the subgroup with behavioral problems.	
Williams & Jenkins	2008			Literature review on the effectiveness of dog visitation therapy in dementia care	Visits by animals to care settings can bring various benefits to patients and residents, including relaxation, less apathy, agitation and aggression, and lower blood pressure. Much of the evidence is, however, anecdotal.	
Recreational Therapy						

Cohen et al	2008	Nursing home	33 participants with Alzheimer's disease and related dementing disorders	<p>A single group, within participants, design, and 2 control conditions including a family visit as usual.</p> <p>Intervention: Making Memories Together is a noncompetitive game where everybody is on the same team, collaborating as necessary on moves. The game consists of a colorful playing board with 4 different categories of squares: people; animals; places & special events; and favorite objects.</p>	<p>An increase in patient pleasure was highly significant. Increases in patient interest, patient satisfaction, and family member satisfaction were all highly significant. The qualitative appeal of the game to family members was very high.</p>	
Fitzsimmons & Buettner	2002	Community	29 elders with dementia	<p>A pre-test/post-test experimental design</p> <p>Intervention: prescribed therapeutic recreation activities tailored to their functioning level, strengths, interests, and needs for one to two hours three to five times per week for two weeks. A total of 73 different interventions were used, with a total of 750 intervention attempts.</p>	<p>A significant decrease in levels of both passivity and agitation</p>	
Kolanowski et al	2002	Community	A 79-year-old white man with AD who showed wandering behavior primarily after dinner (6 PM) and occasionally physically aggressive behaviors.	<p>Observational case study</p> <p>Intervention: activities derived from the Need-Driven Dementia-Compromised Behavior Model.</p>	<p>Activities that matched skill level and personality style of interest resulted in a pattern of greater time on task, participation, and positive mood and fewer dementia related behaviors compared with activities matched to skill</p>	

					level only.	
Kolanowski et al	2005	Nursing home	30 participants	A crossover experimental design Intervention: recreational activities derived from the Need-driven Dementia-compromised Behavior (NDB) model: activities matched to skill level only; activities matched to style of interest only; and a combination of both (NDB-derived) for responding to the behavioral symptoms of dementia.	Significantly more time on task, greater participation, more positive affect, and less passivity were found under NDB-derived and matched to interest only treatments compared with the matched to skill level only treatment or baseline. Agitation and negative affect improved under all treatments compared with baseline	
Kolanowski et al	2011	Nursing home	128 cognitively impaired residents	Randomized double-blind clinical trial Intervention: Three weeks of activities derived from the Need-Driven Dementia-Compromised Behavior model were provided twice daily.	All treatments improved outcomes during intervention except mood	
Ravelin et al	2010	Nursing home	13 residents with dementia	Qualitative study Intervention: watching dance performance	Elders identified dance performance activity as a process. They had a positive attitude towards the dance performance and performers, and they had experiences of different elements of the dance performance.	
Snyder et al	2001	Nursing home	30 residents	A quasi-experimental design Intervention: Subjects were placed on the glider for 20	The glider intervention significantly improved emotions and relaxation. The most noted changes were	

				minutes each day during the intervention phase	found after 10 minutes of swinging. However, no differences were found in aggressive behaviors.	
Van Dijk et al	2012	Nursing home in the Netherlands	151 residents	A quasi-experimental three-group design Intervention: Experimental group 1 joined a living-room theatre activity offered by trained professional caregivers. Experimental group 2 joined a living-room theatre activity offered by professional actors. The control group received a usual reminiscence group activity.	During the intervention, significant differences were found in favor of the group that was offered a living-room theatre activity by actors (E2) on different aspects of behavior, mood and quality of life. At posttest, people in E2 were more alert compared to the control group. Moreover, they recalled more memories and showed less socially isolated behavior compared to the control group	
Sensory Stimulation						
Ancoli-Israel et al	2002	Nursing home	77 residents with dementia	Randomized controlled trial Intervention: Participants were assigned to one of 4 treatments: evening bright light, morning bright light, daytime sleep restriction, or evening dim red light	There were no improvements in nighttime sleep or daytime alertness in any of the treatment groups. Morning bright light delayed the peak of the activity rhythm and increased the mean activity level.	
Anderson et al	2011	Assisted living facility in Australia	12 participants with dementia	A within-subjects mixed methods design Intervention: a comparison between a Snoezelen room containing prescriptive, expensive equipment and a	No significant difference between Snoezelen and garden conditions	

				more everyday existing location that, inevitably, also contained several sensory stimuli.		
Baker et al	2001	Day hospital in UK	50 patients with moderate to severe dementia	A randomized controlled trial Intervention: multi-sensory stimulation (MSS) in eight 30-minute sessions over a 4-week period.	Immediately after MSS and Activity sessions patients talked more spontaneously, related better to others, did more from their own initiative, were less bored/inactive, and were more happy, active or alert. Both groups were more attentive to their environment than before, with a significantly greater improvement from the MSS group.	
Belgrave	2009	A retirement living facility	21 students in the 4 th grade 26 older adults	A pretest–post-test control group repeated-measures design Intervention: Ten 30-minute music therapy sessions occurred over 15 weeks at the retirement facility during which participants engaged in singing, structured conversation, moving to music, and instrument playing interventions.	The interventions “structured conversation” and “moving to music” were more effective in eliciting children's and older adults' interaction behaviors than the interventions “singing” and “instrument playing.” Both child and older adult participants exhibited the interaction behaviors “looks at older adult/child,” “smiles,” and “initiates conversation with older adult/child” more frequently.	Thesis
Brooker et al	1997	Nursing home	4 participants	A sing-case research design Intervention: 10 treatment sessions of aromatherapy, aromatherapy and massage	Only one of the participants benefited from the aromatherapy and massage to a degree that reached statistical significance.	

				combined, and massage alone		
Bruer et al	2007	Clinic	28 elderly cognitively-impaired psychiatric inpatients	A randomized controlled cross-over trial Intervention: music therapy and age-appropriate movie	Immediate and next-day MMSE test scores showed significant improvement, but no long-term impact.	
Casby & Holm	1994	Long-term care facility	3 subjects with AD with a history of repetitive disruptive vocalizations	Three single-subject withdrawal designs (ABA, ACA, and ABCA) Intervention: no intervention (A), relaxing, classical music (B), and favorite music (C)	Classical music and favorite music significantly decreased the number of vocalizations in two of the three subjects.	
Cerin et al	2003	Clinic	63 elderly patients with dementia	A single group repeated measures design Intervention: test the use of color cues as memory aids	No differences in log transformed response time were noted among dementia categories for each test condition. Color cues make a significant difference in short-term memory recall ability compared to form cues.	
Chang et al	2010	Institutional housing	41 residents with dementia	A quasi-experimental design Intervention: background music when residents had their lunch meal	The music program significantly reduced physical and verbal aggressive behavior.	
Chatterton et al	2010			Systematic review on who sings to persons with dementia (PWDs), and with what objectives and effects, to address the question of whether it is the signer or the singing which is effective.	All included studies concurred that individual singing to PWDs can be effective in a variety of ways, depending on contexts and goals. PWD's perceptions of situations may influence the effectiveness of singing interventions.	

Cohen-Mansfield et al	2010	Nursing home	111 residents with dementia who exhibited agitation	<p>Repeated-measured design with randomized assignment of conditions</p> <p>Intervention: Different types of stimuli (music, social stimuli, simulated social stimuli, and individualized stimuli based on the person's self-identity) were presented</p>	<p>All stimulus categories were associated with significantly less physical agitation than baseline observations, and all except for manipulative stimuli were associated with significantly less total agitation. Live social stimuli were associated with less agitation than music, self-identity, work, simulated social, and manipulative stimulus categories. Task and reading stimulus categories were each associated with significantly less agitation than work, simulated social, and manipulative stimulus categories. Music and self-identity stimuli were associated with less agitation than simulated social and manipulative stimuli.</p>	
Cohen-Mansfield et al	2011	Nursing home	193 residents with dementia	<p>Intervention: each participant was presented with 25 predetermined engagement stimuli in random order over a period of 3 weeks. Stimuli were categorized as live social, simulated social, manipulative, work/ task-related, music, reading, or individualized to the participant's self-identity.</p>	<p>Differences between stimulus categories were significant for pleasure and interest but not for negative affect. Pleasure and interest were highest for the live social category, followed by self-identity and simulated social stimuli for pleasure, and for manipulative stimuli in terms of the effect on interest. The lowest levels of pleasure and interest were observed for music. Participants with higher cognitive function had</p>	

					significantly higher pleasure	
Collier et al	2010	Nursing home in England	30 participants with moderate-to-severe dementia	Intervention: included bubble tubes, optic fibers, music of choice, scents, citrus fruits, and sherbet.	Significant improvement in functional performance in both the MSE and the control activity.	
Cooke et al	2010	Aged care facilities in Australia	47 participants with mild to moderate dementia	A randomized cross-over design Intervention: music and reading control groups	A significant increase in the frequency of verbal aggression over time, regardless of group	
Crawford et al	2006	A facility in India	24 participants with dementia	A quasi-experimental design Intervention: 4 weekly treatments of Reiki	Significant increase in mental functioning and memory and behavior problems after Reiki treatment	
Cruz et al	2011	Nursing home	6 residents with moderate to severe dementia	A single-group, pre- and post-test design Intervention: motor and multisensory stimulation in residents' morning care routines	A tendency toward improvements in residents' levels of caregiver-direct gaze, laughing and engagement, and a reduction of closed eyes during morning care.	
Denney	1997	AD facility	10 subjects	A quasi-experimental time series design Intervention: quiet music at mealtime	A reduction in the incidence of agitated behaviors	
Dowling et al	2005	Skilled nursing facility	46 subjects with AD	A randomized controlled trial Intervention: one hour of bright light exposure 5 days a week for 10 weeks	Significant improvements in subjects with aberrant timing of their rest-activity rhythm, morning bright light exposure did not induce an overall improvement in measures of sleep or the rest-activity in all	

					treated.	
Dowling et al	2007	Long-term care facility	70 subjects with AD	A randomized controlled trial Intervention: one that received morning light or one that received afternoon light, or to the control group	Analyses revealed statistically significant differences between groups on agitation/aggression, depression/dysphoria, aberrant motor behavior, and appetite/eating disorders.	
Engström et al	2011	Nursing home	1 resident with dementia	Single case study Intervention: communication in a resident with dementia during usual and Music Therapeutic Caregiving (MTC) morning care.	The Verbal and Nonverbal Interaction scale was used for analysis. Under the MTC condition, the resident's positive verbal and nonverbal communication increased by 23%. Furthermore, negative verbal and nonverbal communication, decreased by 80%, compared to the usual morning care sessions. Under the MTC condition, the resident was able to remember words to songs and singing with the caregiver occurred in 39 of the 40 observed minutes.	
Fetveit et al	2003	Nursing home	11 patients with dementia	Intervention: patients received bright light exposure 2 h/day within the period 08:00–11:00 for two weeks.	Sleep improved substantially with bright light exposure. Waking time within nocturnal sleep was reduced by nearly two h, and sleep efficiency improved	
Gerdner	2000	Long-term care facility	39 subjects with severe cognitive impairment	Intervention: Group A (n = 16) received individualized music for 6 weeks followed by a 2-week "washout" period and 6 weeks of classical "relaxation" music. Group B (n = 23)	A significant reduction in agitation during and following individualized music compared to classical music.	

				received the same protocol but in reverse order. Music interventions were presented for 30 minutes, two times per week.		
Gray & Clair	2002	Residential care	13 residents with dementia	Intervention: four aroma interventions during medication administration: 1) lavender vera (<i>lavendula officinalis</i>); 2) sweet orange (<i>citrus aurantium</i>); 3) tea tree (<i>malaleuca alternifolia</i>); and 4) no aroma (control).	No statistically significant differences across all aroma conditions for either resistive behavior or duration of administration.	
Hammar et al	2011	Nursing home in Sweden	10 residents with severe dementia	A quasi-experimental design Intervention: music therapeutic caregiving (MTC).	Participants' expressions of resistant behavior, such as pull away, grab object and adduction, were significantly reduced under the intervention situation. Positively expressed emotions, specifically pleasure and general alertness, significantly increased under the MTC intervention compared with the 'usual' morning care sessions.	
Hansen et al	2006			Systematic review on randomized controlled trials in which a massage or touch intervention was given to persons suffering from dementia of any type, compared with other treatments or no treatment, and in which effect parameters included measures of behavioral problems, caregiver burden,	2 trails met the inclusion criteria. The very limited amount of reliable evidence available is in favor of massage and touch interventions for problems associated with dementia. However, this evidence addresses only two specific applications: hand massage for the immediate or short-term	

				emotional distress or cognitive abilities, were eligible for inclusion.	reduction of agitated behavior, and the addition of touch to verbal encouragement to eat for the normalization of nutritional intake.	
Hanser et al	2011	Community	14 elders with dementia and their family caregivers	Intervention: music-facilitated stress reduction program, in which the music therapist trains the family caregiver in strategies that are conducted in the home by the caregiver alone.	Both caregivers and care recipients improved self-reported relaxation, comfort, and happiness, when mean scores were compared between baseline and music conditions. Caregivers showed the most benefit	
Hawranik et al	2008	Long-term care facility	51 residents with AD	A randomized controlled trial Intervention: the effectiveness of therapeutic touch, simulated therapeutic touch, and usual care	Physical nonaggressive behaviors decreased significantly in those residents who received therapeutic touch compared with those who received the simulated version and the usual care. No significant differences in physically aggressive and verbally agitated behaviors were observed across the three study groups	
Hickman et al	2007	Hospital and residential care facility	66 elders with dementia	A cluster-unit crossover intervention trial Intervention: four lighting conditions: morning bright light, evening bright light, all-day bright light, and standard light. Each lighting condition was provided for multiple 3-week periods in a predetermined sequence.	Analysis indicated a significant sex-by-treatment interaction. Depressive symptoms were lowest for women and highest for men during morning light.	

Holmes et al	2002	A long-stay psychogeriatric ward	15 patients with severe dementia and agitated behavior	A single-blinded placebo controlled trial Intervention: A 2% lavender oil aromatherapy stream was administered on the ward for a two hour period alternated with placebo (water) every other day for a total of ten treatment sessions.	Nine patients (60%) showed an improvement, five (33%) showed no change and one patient (7%) showed a worsening of agitated behavior during aromatherapy compared with placebo. A comparison of the group median PAS scores during aromatherapy showed a significant improvement in agitated behavior during aromatherapy compared with placebo	
Holmes et al	2006	Nursing home	32 subjects with moderate to severe dementia and apathy	A randomized controlled trial Intervention: 30-minute music or silent periods and was video recorded and the muted recording	The majority of subjects (69%), regardless of dementia severity, showed a significant and positive engagement to live music.	
Holt et al	2003			Systematic review on randomized controlled trials using fragrance from plants defined as aroma therapy as an intervention with people with dementia were considered and outcomes including cognitive function, quality of life, and relaxation.	4 studies have been included in this review; but none had data in a form that could be used. The additional analyses conducted using individual patient data from Ballard 2002 revealed a statistically significant treatment effect in favor of the aroma therapy intervention on measures of agitation and neuropsychiatric symptoms.	
Kim et al	2003			Literature review on bright light as a means of intervention in sleep-wakefulness and behavior disorder among	The effects on sleep disorders were controversial. As a result of limitations in past studies, the effect of	

				patients with dementia	bright light on dementia patients is inconclusive.	
Klages et al	2011	Long-term care home in Canada	24 residents with dementia	Randomized controlled trial Intervention: Nine intervention group participants completed 30-minute Snoezelen room sessions twice a week for six weeks. Sessions were guided by participants' preferences for stimulation.	No significant effects of unstructured Snoezelen room sessions on participants' balance.	
Koger et al	1999			Literature review on the effects of music therapy on dementia	The effect of music therapy was found to be highly significant	
LaBar et al	2000	Clinic	42 subjects, 9 with mild probable AD	Intervention: Subjects were shown pairs of visual scenes, some of which contained emotionally-arousing material, while eye movements were recorded under free viewing conditions	Emotionally-arousing scenes attracted more viewing time and also became the preferential target of the initial visual orientation.	
Lin et al	2007	Community in Hong Kong	70 elders with dementia	A cross-over randomized trial Intervention: the active group (lavender inhalation) for three weeks and then switched to control group (sunflower inhalation) for another three weeks; the other half did the opposite	The mean CCMAI total scores decreased significantly. The CNPI scores changed significantly after receiving Treatment A (Lavandula Angustifolia). There were no period and sequential effects noted.	
Lou	2001			Literature review on interventions using music to decrease the agitated behavior of the demented elders	Music therapy is a useful intervention to help patients deal with a range of behavior problems.	

Miller et al	2001	Long-term care facility	13 subjects with significant cognitive impairment	A quasi-experimental pretest/posttest design Intervention: a modified version of simulated presence therapy called audio presence intervention (API)	In 28 episodes of agitation among seven residents, API produced a significant decline in agitation level as measured by four items from the Haycox Rating Scale. However, in six episodes (four residents), agitation stayed the same or worsened.	
Ozdemir & Akdemir	2009	Community in Turkey	27 patients with mild AD	A quasi-experimental design Intervention: musical therapy, painting inanimate–animate object pictures, and orientation to time–place–person	Significant negative correlation was determined to exist between the MMSE–depression scores and MMSE–anxiety scores; the correlation between the depression–anxiety scores, on the other hand, had a positive significance.	
Park	2010	Community	15 subjects	A quasi-experiment design Intervention: subjects listened to their preferred music for 30 minutes before peak agitation time, for 2 days per week, followed by no music for 2 weeks. The process was repeated once.	The mean pain levels after listening to music were significantly lower than before listening to the music	
Peak & Cheston	2002	In-patient on an assessment ward	4 residents	A series of four single-person or $n = 1$ case studies Intervention: simulated presence therapy	The four showed differing levels of response to the SPT tapes	
Pulsford et al	2000	Nursing home in UK	4 patients with moderate to severe dementia	An ethnographic analysis Intervention: Woodlands	Staff facilitation strategies strongly influence patients' responses to WT. Verbal	

				therapy (WT), a sensory-motor therapeutic activity that aims to encourage interaction with people with moderate or severe dementia	interventions made by staff are grouped in terms of their relative helpfulness for promoting positive responses to WT.	
Ragneskog et al	1996	Nursing home in Sweden	25 residents	Intervention: dinner music, including soothing music, music from 1920s and 1930s, and pop music	Residents who ate dinner became calmer. Dinner music, particularly soothing music, is a way to increase time spent on dinner and let the residents have their dinner more sedately.	
Ragneskog et al	2001	Nursing home in Sweden	4 residents with dementia	Intervention: four sessions in four periods, including a control period without music, two periods where individualized music was played, and one period where classical music was played	Two patients became calmer during some of the individualized music sessions; one patient remained sitting in her armchair longer, and the other patient stopped shouting. For the two patients who were most affected by dementia, the noticeable effect of music was minimal	
Sloane et al	2007	Geriatric units in a psychiatric hospital and residential care facility	66 elders with dementia	A cluster-unit crossover intervention trial Intervention: four conditions: morning bright light, evening bright light, all-day bright light, and minimum standard light.	Night-time sleep increased significantly in participants exposed to morning and all-day light, with the increase most prominent in participants with severe or very severe dementia	
Snow et al	2004	Long-term care facility	7 agitated residents with advanced dementia	A within-subjects ABCBA design Intervention: A = lavender oil, B = thyme oil, C = unscented grapeseed oil	No treatment effects specific to lavender, no treatment effects nonspecific to pleasant smelling substances, and no treatment effects dependent on order of treatment	

					administration	
Sung & Chang	2005			Literature review on preferred music on agitated behaviors for older people with dementia	8 research-based articles met the inclusion criteria and were included in the review. The preferred music intervention demonstrated positive outcomes in reducing the occurrence of some types of agitated behaviors in older people with dementia	
Sung et al	2010	Nursing home	52 participants with dementia	A quasi-experimental pre-test and post-test design Intervention: a 30-minute music listening intervention based on their personal preferences delivered by trained nursing staff in mid afternoon, twice a week for six weeks.	Older adults who received a preferred music listening intervention had a significantly lower anxiety score at six weeks compared to those who received the usual standard care with no music	
Suzuki et al	2010	Nursing home	40 residents with dementia	A quasi-experimental design Intervention: tactile massage 5 times a week for 6 weeks for a total of 30 times.	No change was observed in the tactile massage group. Both the ‘‘aggressiveness’’ score and CgA levels decreased significantly after 6 weeks in the tactile massage group.	
Thorgrimsen et al	2003			Systematic review on the efficacy of aroma therapy as an intervention for people with dementia.	Four studies have been included in this review; but none had data in a form that could be used. The additional analyses conducted using individual patient data from Ballard 2002 revealed a statistically significant	

					treatment effect in favor of the aroma therapy intervention on measures of agitation and neuropsychiatric symptoms.	
Tuet & Lam	2006	Residential home and day care center in Hong Kong	16 patients with dementia exhibiting at least one type of agitated behavior	A crossover design Intervention: MT sessions for 3 weeks and the second received usual care (UC, control therapy) over that period. Three weeks after termination of the music sessions, the second group was submitted to MT sessions and the first group received UC. The MT sessions took place in groups inside the respective centers, 3 times weekly. Each session lasted 45 minutes during the late afternoon	There were significant reductions of total CMAI scores at the end-music therapy period. Similar reductions were not found after UC. No lasting effects were observed after withdrawal MT for 3 weeks.	
van Weert et al	2005	Nursing home in the Netherlands	125 residents with moderate to severe dementia and CNAs	Quasi-experimental pre- and posttest design Intervention: Experimental subjects received an individual 24-hour snoezelen program, based on family history taking and stimulus preference screening. Caregivers were trained, and (organizational) adaptations were made to fulfill the conditions for resident-oriented snoezelen care	Residents receiving snoezelen care demonstrated a significant treatment effect with respect to their level of apathetic behavior, loss of decorum, rebellious behavior, aggressive behavior, and depression.	
Vink et al	2003			Systematic review on randomized controlled trials	10 studies were included. The methodological quality of the	

				that reported clinically relevant outcomes associated with music therapy in treatment of behavioral, social, cognitive and emotional problems of older people with dementia.	studies was generally poor	
Ward-Smith et al	2009	Long-term care facility	20 residents with AD	Intervention: MSE-based therapy	Documented disruptive behavior included pacing, exit-seeking activities, hitting, yelling, and aggressive talking. The use of the MSSE resulted in a decrease in the number of incidences of disruptive behavior, but not the behaviors present.	
Woods & Dimond	2002	Special care unit	10 residents with AD	A within-subject, interrupted time-series design Intervention: therapeutic touch	A significant decrease in overall agitated behavior and in 2 specific behaviors, vocalization and pacing or walking, during treatment and posttreatment.	
Woods et al	2005	Nursing home	57 residents with dementia	A randomized, double-blind, three-group experimental design Intervention: experimental (therapeutic touch), placebo (placebo therapeutic touch), and control (usual care).	A significant difference in overall behavioral symptoms of dementia, manual manipulation and vocalization. The experimental (significant) was more effective in decreasing behavioral symptoms of dementia than usual care, while the placebo group indicated a decreasing trend in behavioral symptoms of dementia compared to usual care.	
Woods et al	2009	Nursing home	65 participants with dementia	A double blind experimental interrupted time series ABAB	Restlessness was significantly reduced in the experimental	

				design Intervention: The experimental group received therapeutic touch with contact on the neck and shoulders delivered twice daily for 3 days (administered over 2 separate treatment periods); the placebo group received a mimic treatment identical in appearance, and the control group received routine care.	group compared to the control group. There was a significant difference in morning cortisol variability among groups across time periods.	
Spiritual Stimulation						
Wentrobe	1998	Nursing home	4 residents	Case study	Reflections concerning the chaplain's ministry	
Technological Support						
Labelle & Mihailidis	2006	A long-term-care unit at a university-affiliated hospital in Canada	8 participants	A multiple-treatment, single-subject research design Intervention: An automated prompting system was modified to provide both verbal and audiovisual prompts,	Overall, the participants were able to complete more steps with the assistance of either automated prompt and required fewer caregiver interactions. Audiovisual prompting significantly reduced the number of caregiver interactions required.	
Mihailidis et al	2008	Long-term care facility in Canada	6 elders with moderate-to-severe dementia	A single subject design Intervention: a computerized device (called COACH) assisting people with dementia	Participants with moderate-level dementia were able to complete an average of 11% more handwashing steps independently and required	

				through ADL and reducing caregivers' burden	60% fewer interactions with a human caregiver	
O'Connor et al	2011	Nursing home	1 resident	<p>A single-system ABA withdrawal design</p> <p>Intervention: A family member pre-recorded videos for use during episodes of RTC, in which the family member spoke directly to the participant to encourage participation</p>	<p>Introduction of the video-simulated presence (VSP) significantly reduced resistance to care (RTC) during the basic care tasks of feeding and talking medication. This effect was reversed when the intervention was withdrawn.</p> <p>Participation increased following VSP, demonstrating clear trends toward clinical significance.</p>	
Tsai et al	2010	Nursing homes in Taiwan	57 residents	<p>A quasi-experimental design</p> <p>Intervention: The videoconference program was designed for once a week (the in-person visiting frequency for the majority of families). The software at the facilities was either MSN or Skype via a 2 M/256K wireless modem using a large (15.6 cm) laptop.</p>	<p>Subjects in the experimental group had significantly higher mean emotional and appraisal social support scores at one week and three months after baseline than those in the control group. Subjects in the experimental group also had lower mean loneliness scores at one week and three months after baseline than those in the control group, and lower mean depressive status scores at three months after baseline.</p>	
Yeung et al	2009	Nursing home	9 monolingual Chinese immigrants	Intervention: videoconference follow-up visits,	The subjects, their families, and the nursing staff were highly satisfied with the telepsychiatry service. It is feasible to provide psychiatry consultations to ethnic immigrants in a nursing home	

