National Non-Pharmacological Dementia Care Practices Initiative

# Literature Search: Non-Pharmacological Dementia Practice-Related Research

| Author | Year | Setting | Participants | Study Design | Results | Notes |
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| **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<br><br>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. | |

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| McCurry et al | 2004 | Community | 3 participants with dementia | A pre- and post-test design (3 cases reported)<br><br>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<br>6 single-case designs (SCDs; | Behavioral therapy + Psychosocial therapy |

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| | | | | 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<br><br>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<br><br>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<br><br>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 |

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| Beattie et al | 2004 | Nursing home | 3 residents with probable AD | Multiple case design<br><br>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<br><br>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<br><br>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 |

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| | | | | 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 |
| Brodaty & 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<br><br>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 |

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| | | | | 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 | Experiment1: 4 males, 10 females, early to middle stage of AD, can participate in imitative tasks and follow verbal directions<br><br>Experiment2: 1 male, 11 females, early to middle stage of AD, can participate in imitative tasks and follow verbal directions | A single-group, pre- and post test design<br><br>Intervention:<br>Experiment1: vocal and instrumental music with movement activities led by therapist using two types of verbal cues (one/two-word vs. constant)<br><br>Experiment2: 4 conditions – exercise to vocal music, exercise to instrumental music, exercise with instruments to vocal music, and exercise with instruments to instrumental music | Experiment1: continuous cueing/easy treatment resulted in greater participation than the one cue/difficult treatment<br><br>Experiment2: exercise to instrumental music resulted in significantly higher participation than exercise with instruments to vocal music | 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 in improvement with regard to agitation, and the total scores of both patients and caregivers | Psychosocial therapy + sensory stimulation |

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| | | | | times per week for 5 consecutive weeks | were lower | |
| Christofoletti et al | 2008 | Residential care | 54 participants | A six-month longitudinal design<br><br>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<br><br>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 |

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| | | | | 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<br><br>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 |

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| | | term care home for older people | moderate-to-severe dementia<br><br>6 staff members | test design<br><br>Intervention: Implementing motor and multisensory stimulation strategies on residents' morning care routines by staff after the provision of group training and individualized assistance<br><br>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<br><br>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 |

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| | | | | (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.<br><br>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<br><br>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<br><br>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 |

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| | | | | 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<br><br>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<br><br>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)<br><br>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 |

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| | | | cognitive impairment | institutional cycle design<br><br>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<br><br>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<br><br>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. | |

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| Kovach et al | 2006 | Nursing home | 114 subjects | A double-blinded randomized experiment<br><br>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<br><br>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 acupressure and Montessori-based- | Sensory stimulation + physical exercise |

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| | | | | cross-over design<br><br>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. | 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. | |
| Lin et al | 2011 | Nursing facility | 104 participants | An experimental study using repeated measurements<br><br>Intervention: The experimental group received a total of twelve 30-min group music intervention sessions, conducted twice a week for six consecutive weeks | 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, verbally non-aggressive behavior, and physically aggressive behavior, while a reduction in verbally aggressive behavior was shown only at the 6th session. | Sensory stimulation + psychosocial therapy |
| MacKinlay & Trevitt | 2010 | Aged-care facility | 113 older adults with dementia | Focus group<br><br>Small groups for spiritual reminiscence, to meet weekly over 6 weeks or 6 months | Members of the 6-month groups expressed a desire to continue meeting after the completion of the research project<br><br>The group sessions also | Spiritual stimulation + cognitive stimulation + psychosocial therapy |

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| | | | | | helped individuals to relate to each other in a different way to that experienced in the general milieu of the aged-care facility<br><br>Recommendation:<br>Nurses work with small group of residents | |
| Mahendra & Arkin | 2003 | Community | 24 mild to moderate stage AD patients in Elder Rehab program<br><br>Student Rehab partners | A single-group, pre- and post test design<br><br>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. | Long-term cognitive–linguistic interventions can maintain or improve aspects of language performance in very different individuals with a progressive dementia | Cognitive stimulation + communication & language + physical exercises + psychosocial therapy |
| Mahendra & Arkin | 2004 | Community | 24 mild to moderate stage AD patients in Elder Rehab program<br><br>Student Rehab partners | A single-group, pre- and post test design<br><br>Intervention: Volunteers in Partnership and Elder Rehab programs | Significant improvements of AD patients' physical and psychological conditions. Significant family caregivers' satisfaction with the intervention. | Cognitive stimulation + communication & language + physical exercises + psychosocial therapy |
| Mathews et al | 2001 | Residential care facility | 21 residents with dementia | A reversal experimental design<br><br>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 | Results showed increased levels of participation during the experimental condition observations where rhythmic music accompanied the exercise activities. | Sensory stimulation + physical exercise |

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| | | | | with instrumental music | | |
| McCurry et al | 2011 | Independent community living | 132 people with AD and their in-home caregivers. | A randomized controlled trial<br><br>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<br><br>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<br><br>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<br><br>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 |

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| Paukert et al | 2010 | Clinic/ community | 9 elders with dementia and their family caregivers | Pilot study<br><br>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<br><br>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<br><br>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 |

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| | | | | 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<br><br>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<br><br>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<br><br>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 |

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| | | | | 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<br><br>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<br><br>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<br><br>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 |

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| | | | | 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.<br><br>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<br><br>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.<br>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<br><br>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 |

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| | | | | 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<br><br>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<br><br>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<br><br>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 |

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| | | | | 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 |
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| Aguirre et al | 2012 | Community and nursing home in UK | 272 participants with dementia | A randomized controlled trial<br><br>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, | |

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| | | | Experiment2: 19 patients with AD and 21 non-demented controls | schematic drawings of common objects presented at the rate of 10 s/picture.<br><br>Experiment2: participants were asked for immediate and delayed free picture recall with presentation rates of 10, 5 and 1 s/picture. | primacy effects were significantly impaired in patients with dementia at all delays of recall.<br><br>Experiment2: primacy effects were significantly impaired in demented patients versus controls. | |
| Camberg et al | 1999 | Nursing home | 54 residents with a history of agitated or withdrawn behaviors | Latin-Square, double blinded, 3-factor design with restrictive randomization of three treatments<br><br>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. | 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. | |
| Chao et al | 2008 | A nursing home in northern Taipei | 10 residents | A qualitative research design<br><br>Participant observation was used to explore the process of individual reminiscence therapy and identify nursing roles in the process generated. | Stimuli related to participants' past lives were helpful for initiating reminiscence. | |
| Clare et al | 2002 | Clinic in UK | 12 participants with | A quasi-experimental pretest | Training produced a | |

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| | | | probable AD | posttest design<br><br>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<br><br>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<br><br>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 | |

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| | | | | | 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<br><br>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<br><br>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<br><br>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 | |

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| | | | | 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<br><br>Study 2: 16 elders with early AD and 16 healthy elders | Study 1: prospective remembering (a text-reading task)<br><br>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<br><br>Study 2: The Alzheimer's disease group (63%) demonstrated benefit in prospective remembering in the combined condition as | |

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| | | | | | 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<br><br>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<br><br>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 | |

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| | | facility in Taiwan | dementia | randomized control trial<br><br>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<br><br>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<br><br>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 | |

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| | | | | 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<br><br>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<br><br>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 | |

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| | | | | | 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<br><br>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. | |

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| | | | | 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<br><br>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 | |

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| | | | | | 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 |

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| | | 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 |
| Jelcic et al | 2012 | Clinic | 213 participants with mild memory decline | An observer-blinded randomized controlled trial<br><br>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<br><br>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). | |

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| | | | | 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<br><br>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. | |

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| 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<br><br>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 | |

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| | | | | 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<br><br>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<br><br>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. | |

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| 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<br><br>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<br><br>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<br><br>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 | |

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| | | | | 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<br><br>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<br><br>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 | |

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| | | | | 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<br><br>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. | |

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| | | | | home, and offers more choice, meaningful activity, and privacy than traditional settings | | |
| Schwarz et al | 2004 | A long-term care facility | | A pretest, post-test design with mixed methods<br><br>Intervention: environmental assessment with the Professional Environmental Assessment Protocol (PEAP), behavioral mapping, and focus-group interviews with staff members. | 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 | A quasi-experimental design<br><br>Intervention: a 12-week health promotion course for older adults with early- stage dementia | 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 | 45 clusters, stratified by healthcare setting (nursing home, hospital, mental health service)<br><br>Study population included the professionals included in | A cluster randomized, single-blinded, controlled trial<br><br>Intervention: two occupational therapists, a manager, and a physician working at Dutch healthcare organizations that deliver community | Results were not reported | |

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| | | | 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<br><br>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<br><br>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<br><br>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<br><br>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 | |

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| | | | | 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<br><br>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 | |

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| | | Puget Sound Health Care System clinical research unit. | women) with amnestic mild cognitive impairment ranging in age from 55 to 85 years | clinical trial<br><br>Intervention: a high-intensity aerobic exercise or stretching control group.<br>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<br><br>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<br><br>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 | |

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| | | | | 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<br><br>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<br><br>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 | |

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| | | | | 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<br><br>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<br><br>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 | |

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| | | | | 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<br><br>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<br><br>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. | |
| Jedrziewski 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<br><br>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 | |

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| | | | | 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<br><br>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. | |

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| | | | | patients with dementia | | |
| Nascimento et al | 2012 | Clinic in Brazil | 20 patients with mild to moderate AD | A controlled trial<br><br>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<br><br>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. | |

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| Roach et al | 2011 | Long-term care facility | 82 residents with mild to severe AD | Randomized, controlled, single-blinded clinical trial<br><br>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<br><br>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<br><br>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. | |

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| | | | | paralysis of the facial nerve. | | |
| Williams & Tappen | 2007 | Nursing home | 90 residents with AD | Randomized controlled trial<br><br>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. | 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 | A three-group, repeated-measures design with random assignment to treatment group<br><br>Intervention: a 16-week program of comprehensive exercise, supervised walking or social conversation. | Depression was reduced in all three groups with some evidence of superior benefit from exercise. | |
| Yaguez et al | 2011 | Clinic | 27 patients with AD | A randomized controlled trial<br><br>Intervention: Exercise Group received 6 weeks movement training. Control Group participated in a standard care group, which served as a control intervention | 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. | |

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| 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<br><br>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<br><br>Phase 1: setting analysis<br>Phase 2: functional analysis<br>Phase 3: noncontingent reinforcement | The effectiveness of a functional analysis administered by nursing home staff with no previous training in behavioral assessment was demonstrated. | |

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| | | | 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<br><br>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. | |

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| Boehm et al | 1995 | Nursing home | 2 residents with dementia | An A-B-A-B design<br><br>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<br><br>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<br><br>1. Behavioral management intervention<br>2. Managing resistive behavior<br>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. | |

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| Brenske et al | 2008 | Nursing home | 6 individuals with dementia | A reversal (ABAB) design<br><br>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. | |
| Brodaty et al | 2003 | Nursing home in Australia | 86 subjects with dementia | A randomized controlled trial<br><br>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<br><br>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<br><br>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 | |

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| | | | | 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. | |
| Carpiac-Claver & Levy-Storms | 2007 | Skilled nursing facilities and assisted living facilities | 14 residents and 13 nurse aides | Qualitative study<br><br>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<br><br>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<br><br>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. | |

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| Chenoweth et al | 2009 | Urban residential sites | 15 care sites with 289 residents | A cluster randomized controlled trial<br><br>Intervention: Care sites were randomly assigned to person-centered care, dementia-care mapping, or usual care. | 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. | |
| Chien & Lee | 2011 | Dementia care center in Hong Kong | 92 Chinese families of a relative with dementia | A randomized controlled trial<br><br>Intervention: dementia family care program and routine care only | Participants in the family program reported significantly greater improvements in clients' symptoms and institutionalization rates, and caregivers' quality of life and burden | |
| Chodosh et al | 2006 | Clinic | 232 medical providers | A clinic-level randomized, controlled trial<br><br>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- | 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. | |

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| Chrzescijanski et al | 2007 | Residential aged care in Australia | 43 residents and 75 staff | A simple interrupted time series design<br><br>Intervention: The staff education program was designed to change staff attitudes and perceptions towards their care management of the person with dementia. | A lower frequency of episodes of aggression at least in the short term, following the introduction of the education program. | |
| Deudon et al | 2009 | Nursing home in France | 306 patients with dementia | A randomized controlled trial<br><br>Intervention: An 8-week staff education and training program was conducted in the nursing homes | There was a significant decrease in the global CMAI score between baseline and W8 and between baseline and W20 in the intervention group 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 | |
| Diwan & Phillips | 2001 | Community and nursing home | 73 clients with dementia | 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 | Most CM activity focused on service coordination rather than on direct attempts to manage problem behaviors | |

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| | | | | 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<br><br>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<br><br>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<br><br>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. | |

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| Finnema et al | 2005 | Psychogeriatric wards in nursing homes in the Netherlands | 146 residents with AD, mixed AD and vascular dementia, and dementia syndrome<br><br>99 nursing assistances | A multi-site randomized clinical trial<br><br>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<br><br>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<br><br>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. | |

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| Haupt et al | 2000 | Community | 14 patients and their caregiving relatives | A 3-month, expert-based and conceptualized group intervention<br><br>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. | 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. | |
| Hoeffer et al | 2006 | Nursing home | 37 CNAs and 69 residents | A crossover design with randomization<br><br>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. | Compared with the control group, treatment groups significantly improved in the use of gentleness and verbal support and in the perception of ease. | |
| Huizing et al | 2009 | Psychogeriatric nursing home | 371 nursing home residents | A cluster-randomized trial | No treatment effect on restraint status, restraint | |

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| | | 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<br><br>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 ser vices and programs. Most action steps were assigned and completed by veteran's spouses and the majority were successfully accomplished. On average, fami lies had two contacts per month with care coordina tors. | |

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| 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<br><br>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<br><br>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. | |

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| Lim | 2003 | A special dementia care facility in Korea | 8 residents with mild cognitive impairment | A quasi-experimental time series design<br><br>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. | 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 | 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 | 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 | |
| Magai et al | 2002 | Nursing home | 91 mid- to late-stage dementia patients and their staff caregivers | A randomized controlled trial<br><br>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 | 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. | |

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| 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<br><br>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<br>(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<br><br>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 | |

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| | | 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<br><br>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<br><br>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 | |

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| Robinson et al | 2007 | Nursing home | 388 family members and 384 staff members | A randomized controlled trial<br><br>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. | 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) | A pretest–post-test control group repeated-measures design<br><br>Intervention: a new night monitoring system designed for informal caregivers to use in the home. | 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 | Cluster randomized multi-center study with one-year follow-up<br><br>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. | 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 | A randomized controlled trial<br><br>Intervention: The intervention offered to the eight intervention | No statistically significant, nor clinically relevant effects in favor of the intervention group on the behavioral outcome | |

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| | | | | 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<br><br>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 | |

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| | | | | 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. | 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. | |
| Teel & Leenerts | 2005 | Community | 6 spouse caregivers of persons with dementia | A single-group, pre- and post test design<br><br>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. | 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. | |
| Tesad et al | 2005 | Nursing home in Norway | 4 nursing homes | A randomized single-blind controlled trial<br><br>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. | 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 | |

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| Tesad et al | 2010 | Nursing home in Norway | 4 nursing homes | A randomized controlled trial<br><br>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<br><br>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<br><br>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<br><br>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 | |

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| | | | | Intervention: Staff received education about nutritional needs and individualized nutritional care | decreased.<br>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<br><br>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<br><br>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<br><br>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<br><br>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. | |

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| **Psychosocial Therapy** | | | | | | |
| Bakker et al | 2011b | Psychiatric-skilled nursing home in the Netherlands | 168 patients with dementia and other cognitive disorders | Randomized controlled trial<br><br>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<br><br>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. | |

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| Cheston et al | 2003 | Community in England | 42 participants with dementia | Randomized controlled trail with baseline and follow-up measures<br><br>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 | 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. | |
| Cohen-Mansfield et al | 2006 | Adult day center and nursing home | 93 elderly persons with dementia | A randomized controlled trial<br><br>Intervention: to help participants engage in activities designed to correspond to each participant's most salient self-identity | 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. | |
| Doyle et al | 1997 | Long-term care facility | 12 patients with severe dementia | Case study<br><br>Intervention: psychosocial interventions in reducing the frequency of noisemaking, were contingent reinforcement of quiet behavior and environmental stimulation tailored to individual preferences | 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 | |

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| 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<br><br>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<br><br>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 | |

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| | | | | 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. | three measurements. Closer inspection of individual group performance showed that the live cats had a stronger effect on<br>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. | |
| Ishizaki et al | 2002 | Day care | 34 patients with mild cognitive impairment | A quasi-experiment design<br><br>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. | A significant improvement was found for the global clinical measure, the observation scale, and the projective test in the experimental group after the intervention. | |
| Kasi-Godley & Gatz | 2000 | | | Review of 6 psychosocial interventions for individuals with dementia. | 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. | |

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| | | | | | 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<br><br>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<br><br>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 | Experiment1: preference and engagement assessments | For 3 of 4 participants, the vocal modality was optimal, while the tangible modality | |

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| | | | | 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<br><br>15 preschool children from the facility's on-site child care center | A single group repeated measures design<br><br>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<br><br>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 | |

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| | | | | | 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<br><br>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<br><br>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 | |

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| | | | | | 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<br><br>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<br><br>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<br><br>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. | |

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| Sellers | 2006 | Skilled nursing facility | 4 elders | An A-B-A-B design<br><br>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** | | | | | | |

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| Cohen et al | 2008 | Nursing home | 33 participants with Alzheimer's disease and related dementing disorders | A single group, within participants, design, and 2 control conditions including a family visit as usual.<br><br>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. | 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. | |
| Fitzsimmons & Buettner | 2002 | Community | 29 elders with dementia | A pre-test/post-test experimental design<br><br>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. | A significant decrease in levels of both passivity and agitation | |
| 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. | Observational case study<br><br>Intervention: activities derived from the Need-Driven Dementia-Compromised Behavior Model. | 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 | |

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| | | | | | level only. | |
| Kolanowski et al | 2005 | Nursing home | 30 participants | A crossover experimental design<br><br>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<br><br>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<br><br>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<br><br>Intervention: Subjects were placed on the glider for 20 | The glider intervention significantly improved emotions and relaxation. The most noted changes were | |

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| | | | | 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<br><br>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<br><br>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<br><br>Intervention: a comparison between a Snoezelen room containing prescriptive, expensive equipment and a | No significant difference between Snoezelen and garden conditions | |

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| | | | | 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<br><br>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 4th grade<br><br>26 older adults | A pretest–post-test control group repeated-measures design<br><br>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<br><br>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. | |

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| | | | | combined, and massage alone | | |
| Bruer et al | 2007 | Clinic | 28 elderly cognitively-impaired psychiatric inpatients | A randomized controlled cross-over trial<br><br>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)<br><br>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<br><br>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<br><br>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. | |

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| Cohen-Mansfield et al | 2010 | Nursing home | 111 residents with dementia who exhibited agitation | Repeated-measured design with randomized assignment of conditions<br><br>Intervention: Different types of stimuli (music, social stimuli, simulated social stimuli, and individualized stimuli based on the person's self-identity) were presented | 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. | |
| Cohen-Mansfield et al | 2011 | Nursing home | 193 residents with dementia | 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. | 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 | |

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| | | | | | 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<br><br>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<br><br>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<br><br>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<br><br>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<br><br>Intervention: one hour of bright light exposure 5 days a week for 10 weeks | Significant improvements in subjects with aberrant timing of heir rest-activity rhythm, morning bright light exposure did not induce an overall improvement in measures of sleep or the rest-activity in all | |

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| Dowling et al | 2007 | Long-term care facility | 70 subjects with AD | A randomized controlled trial<br><br>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<br><br>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. | |

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| | | | | 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 (lavendula officinalis); 2) sweet orange (citrus aurantium); 3) tea tree (malaleuca alternifolia); 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<br><br>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 | |

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| | | | | 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<br><br>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<br><br>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. | |

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| Holmes et al | 2002 | A long-stay psychogeriatric ward | 15 patients with severe dementia and agitated behavior | A single-blinded placebo controlled trial<br><br>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<br><br>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.<br>As a result of limitations in past studies, the effect of | |

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| | | | | 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<br><br>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<br><br>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. | |

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| Miller et al | 2001 | Long-term care facility | 13 subjects with significant cognitive impairment | A quasi-experimental pretest/posttest design<br><br>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<br><br>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<br><br>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<br><br>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<br><br>Intervention: Woodlands | Staff facilitation strategies strongly influence patients' responses to WT. Verbal | |

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| | | | | 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<br><br>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<br><br>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 | |

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| 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<br><br>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<br><br>Intervention: tactile massage 5 times a week for<br>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 | |

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| | | | | | 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<br><br>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 severs dementia and CNAs | Quasi-experimental pre- and posttest design<br><br>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 | |

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| | | | | 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<br><br>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<br>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 | |

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| | | | | design<br><br>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** | | | | | | |
| Wentroble | 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<br><br>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<br><br>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 | |

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| | | | | through ADL and reducing caregivers' burden | 60% fewer interactions with a human caregiver | |
| O'Connor et al | 2011 | Nursing home | 1 resident | A single-system ABA withdrawal design<br><br>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 | 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. Participation increased following VSP, demonstrating clear trends toward clinical significance. | |
| Tsai et al | 2010 | Nursing homes in Taiwan | 57 residents | A quasi-experimental design<br><br>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. | 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. | |
| 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 | |