International Psychogeriatrics (2010), 22:2, 189–200 © International Psychogeriatric Association 2009
doi:10.1017/S1041610209990615

REVIEW

A systematic review of communication strategies for people with dementia in residential and nursing homes

Emmelyne Vasse,[1] Myrra Vernooij-Dassen,[2] Anouk Spijker,[1] Marcel Olde Rikkert[3] and Raymond Koopmans[4]

[1] *Scientific Institute for Quality of Healthcare (IQ healthcare) and Nijmegen Alzheimer Centre, Radboud University Nijmegen Medical Centre, Nijmegen, The Netherlands*
[2] *Scientific Institute for Quality of Healthcare (IQ healthcare) and Nijmegen Alzheimer Centre, Radboud University Nijmegen Medical Centre, Nijmegen, Kalorama Foundation, The Netherlands*
[3] *Department of Geriatrics and Nijmegen Alzheimer Centre, Radboud University Nijmegen Medical Centre, Nijmegen, The Netherlands*
[4] *Department of Primary and Community Care, Center for Family Medicine, Geriatric Care and Public Health and Nijmegen Alzheimer Centre, Radboud University Nijmegen Medical Centre, Nijmegen, The Netherlands*

ABSTRACT

Background: The impairment of verbal skills of people with dementia challenges communication. The aim of this review was to study the effects of nonpharmacological interventions in residential and nursing homes on (1) communication between residents with dementia and care staff, and (2) the neuropsychiatric symptoms of residents with dementia.

Method: Pubmed, PsychInfo, Web of Science, the Cochrane Library, and reference lists from relevant publications were systematically searched to find articles about controlled interventions with communication strategies. The data collected were pooled and subjected to a meta-analysis.

Results: Nineteen intervention studies were selected for this review. They included structured and communicative "sessions at set times" for residents (e.g. life review) and communication techniques in activities of "daily care" applied by care staff (e.g. sensitivity to nonverbal communication). A meta-analysis of five set-time interventions (communication) and another meta-analysis of four set-time interventions (neuropsychiatric outcomes) found no significant overall effects. Individual set-time intervention studies report positive effects on communication when interventions are single-task sessions, like life review or one-on-one conversation. Interventions around daily care activities had positive effects on communication outcomes. Effects of both types of interventions on neuropsychiatric symptoms were divergent.

Conclusion: This review indicates that care staff can improve their communication with residents with dementia when strategies are embedded in daily care activities or interventions are single-task sessions at set times. These results offer the possibility of improving the quality of care, but not of directly reducing neuropsychiatric symptoms. More research is needed to study the effect of communication interventions on neuropsychiatric symptoms.

Key words: psychosocial intervention, nonpharmacological intervention, residential facilities

Introduction

Currently, about 2 million Europeans are diagnosed with dementia every year (Wancata *et al.*, 2003). Most of these people continue to live in the community, but various cognitive and neuropsychiatric symptoms become more pronounced as the disease progresses and contribute to placement in institutionalized care (Hope *et al.*,1998; Buhr *et al.*, 2006). Although intensive support programs for people with dementia and their caregivers can delay institutionalization (Spijker *et al.*, 2008), about 70% of these people in the Netherlands are eventually placed in a residential or nursing home (de Klerk, 2001).

While caring for one person with dementia can be a difficult task, caring for a group of patients can be a real challenge. Neuropsychiatric symptoms are very common, and more than 80% of the cognitively impaired nursing-home residents in the Netherlands have at least one clinically significant neuropsychiatric symptom

Correspondence should be addressed to: Emmelyne Vasse, MSc, Scientific Institute for Quality of Healthcare, Radboud University Nijmegen Medical Centre, P.O. Box 9101, 114 IQ healthcare, 6500 HB Nijmegen, The Netherlands. Phone: +31 243 666 265; Fax: +31 243 540 166. Email: E.Vasse@iq.umcn.nl.
Received 12 Jan 2009; revision requested 13 Mar 2009; revised version received 11 Jun 2009; accepted 15 Jun 2009. First published online 29 July 2009.

(Zuidema *et al.*, 2007). The most frequently observed behaviors (prevalences of 30–35%) are aggression/agitation, apathy, and irritability. In other countries, similar incidences of these behaviors occur among people with dementia whether they are institutionalized or not (Lyketsos *et al.*, 2002; Engelborghs *et al.*, 2005). Care staff find it difficult to cope with the aggressive, hostile, stubborn, resistant, and unpredictable behavior of residents (Brodaty *et al.*, 2003a), so that working with cognitively impaired people is associated with much stress (Novak and Chappell, 1996).

Unmet needs can trigger neuropsychiatric symptoms (Hancock *et al.*, 2006), as can language disorders (Potkins *et al.*, 2003), discomfort, or pain. The residents' impaired communication skills make it very difficult for care staff to identify and address the source of the disturbed behavior.

Antipsychotic drugs are frequently used in dementia care to treat neuropsychiatric symptoms (Snowdon *et al.*, 2006), but these medications only relieve the symptoms and do not treat the underlying causes of the behavior. Furthermore, these drugs are known to cause serious side effects (e.g. stroke or increased mortality rates), and are not suitable for routine use (Schneider *et al.*, 2005). Nonpharmacological interventions are preferred to drugs in the treatment of neuropsychiatric symptoms.

Interventions therefore need to be investigated to encourage and ease communication between care staff and residents. Communication is achieved by speech, writing, gesture, posture, gaze, affect, and intonation. These are specific to the place and purpose, or the context, of the communication. Care staff need to be aware of how residents signal the need to communicate and how to react to the signals.

Several reviews about the use of nonpharmacological interventions in dementia care have recently been published (Brodaty *et al.*, 2003b; Livingston *et al.*, 2005; Verkaik *et al.*, 2005), but these do not focus on people with dementia in institutional care or the effects of communication strategies on neuropsychiatric symptoms.

The aims of this systematic review were to appraise (1) the effectiveness of communication-enhancing interventions for the care staff and/or residents with dementia in institutional care settings, and (2) the effects of these interventions on neuropsychiatric symptoms.

Methods

Search strategy

We searched Pubmed, PsychInfo, and Web of Science (1980 – February 2007) for controlled, nonpharmacological, intervention studies that included institutionalized people with dementia and/or care staff. The following search strategy was used:

- (communication OR interaction)
- AND (nursing homes OR nursing home OR residential facilities OR residential facility OR hospitals OR hospital OR institutionalized OR institutionalised OR inpatient OR inpatients OR long-term care OR geriatric nursing OR in-patients OR patients OR residents OR ward OR wards OR "care unit" OR "care units" OR residential OR "assisted living" OR in-patient)
- AND (vascular dementia OR lewy body disease OR alzheimer's OR alzheimer OR "Alzheimer Disease" [MeSH] OR "Lewy Body Disease" [MeSH] OR "Dementia, Vascular"[MeSH] OR "Dementia" [MeSH: noexp])
- AND (controlled OR trial).

We also identified trials in an additional search of the Cochrane Library in February 2007 using the words Dementia [MESH] AND interact* OR communicat*, and we reviewed the references of the studies we included to identify any other relevant studies.

Inclusion criteria

The studies to be included in this review had to meet all of the following criteria:

1. *Type of study:* a randomized or nonrandomized controlled trial with the full text obtainable in English or Dutch. A randomized or nonrandomized controlled trial was defined as a study that compared the results from the intervention group to the results from one or more comparison groups receiving the usual intervention or no intervention at all; or a standardized, comparable intervention without the communication component.
2. *Participants:* people with dementia living in residential care homes or in nursing homes and/or professional caregivers working in long-term care facilities with people with dementia. The inclusion criteria for the trial required a diagnosis of dementia or screening for cognitive impairment of resident participants. If groups of residents were mixed with nonresidents, at least 80% of the participants had to be residents or else their separate results needed to be available.
3. *Intervention:* an intervention aimed at improving the communication of participants. Multi-component interventions had to include a communicative component. Communication was defined as sharing information by speaking, writing, body movements, or other signaling behavior.
4. *Outcomes:* at least one outcome measure was required to address the quantity and/or quality of communication performance or else no productive communication (e.g. apathy or noncompliance) of the participants.

Reviews of trials, pharmacological interventions, and studies in which the participants served as their own control group were excluded.

Screening the studies

Two independent reviewers (EV and MVD) assessed the candidate studies for inclusion in three screening rounds. During the first round, they screened articles by title and type of article to determine whether they met the inclusion criteria. In the second round (abstracts) and the third round (full text), they screened the remaining articles if the abstract or full text was available. Studies that failed to meet the inclusion criteria were excluded. In cases of doubt, the articles were included in the next review round.

Quality of the studies

Two researchers (EV and AS) assessed the methodological quality of the studies independently and discussed the results for consensus. They assessed the following criteria, after Higgins and Green (2008), to check for differences in methodological quality between studies: selection bias (method of randomization, allocation concealment, inclusion/exclusion criteria specified, and similarity of groups at baseline), performance bias (assessors blinded to outcome), attrition bias (characteristics of participants lost to follow-up described, and intention-to-treat analysis), and detection bias (power calculation and valid outcome measures). Blinding of participants was not included as a quality criterion because it is impossible for the types of interventions included in this review.

Data collection and analysis

First, the characteristics of the interventions and outcome measures used for communication and neuropsychiatric symptoms were extracted from the articles. The interventions were then sorted by type so that we could extract their effectiveness on communication and neuropsychiatric symptoms, when data were available.

We performed a meta-analysis using the Cochrane Collaboration Group's Review Manager 5 (The Cochrane Collaboration, Copenhagen, Denmark) when two or more studies were randomized controlled trials and the outcome measures and type of intervention could be compared. Because of the continuous nature of the data and differences in the outcome measures used, we calculated a standardized mean difference (SMD), which is a uniform standardized score, to compare the data from experimental groups with the data from the control groups. We calculated SMDs (for the experimental group and the control group) as the difference between the mean change in communication or neuropsychiatric symptoms, before and after the intervention, divided by the standard deviation of the difference.

If a measurement was repeated, the data from the first measurement after the intervention were used as post-intervention data in the meta-analysis. In case multiple intervention and/or control groups were included in a study, these groups were combined and included as a single group in the meta-analysis (Higgins and Green, 2008).

Statistical significance was set at $p < 0.05$. We set up a fixed-effects model for each meta-analysis. If the statistical heterogeneity, as calculated by the I_2 statistical test, was significant ($p < 0.05$), the analyses were repeated with the random-effects model (Egger *et al.*, 1997; Higgins and Green, 2008). Significant between-group effects for both communication or neuropsychiatric symptoms of intervention studies that could not be included in the meta-analyses were described separately for each type of intervention study.

Results

Search results

The search retrieved 721 articles that met the search criteria. After we excluded reviews and pharmacological trials, 488 articles remained. The first screening round resulted in 85 titles of articles that met the inclusion criteria or raised doubt. We screened the abstracts of these 85 articles, and 35 articles remained for full-text assessment in the final screening round. Thirteen of the 35 articles did not meet the inclusion criteria; thus, 22 articles describing 19 different intervention studies were included in this review.

Description of the studies

We identified two overall "types" of interventions within the 19 studies. The first type (10 studies) is a communicative session or intervention for residents carried out by a trained specialist or staff member at a "set-time session". The aim of the second type (9 studies) was to teach care staff to apply communication techniques in daily care activities, the "daily-care" intervention.

The ten set-time sessions or interventions included a walking program combined with conversation (Friedman and Tappen, 1991; Cott *et al.*, 2002; Tappen *et al.*, 2002), group validation therapy (Toseland *et al.*, 1997; Tondi *et al.*, 2007), life review programs (Tabourne, 1995; Haight *et al.*, 2006), cognitive stimulation therapy (Spector *et al.*, 2003; Orrell *et al.*, 2005), and activity therapy (Politis *et al.*, 2004). Table 1 shows the study characteristics of the set-time intervention studies.

Table 1. Characteristics and findings of set-time studies

AUTHOR/YEAR	INTERVENTION AND COMPARISON	STUDY DESIGN/ LENGTH	N	OUTCOME MEASURES	SIGNIFICANT BETWEEN GROUP EFFECTS*
Friedman and Tappen, 1991	T: Conversation during planned walking; 30 min 3 times/week C: Conversation only; 30 min 3 times/week	RCT 10 weeks	R: 30 S: -	Cm: CAS; COS NPS: -	COS ($p < 0.007$)
Politis *et al.*, 2004	T: Individual, standardized, structured activity; 30 min 3 times/week C: One-on-one unstructured interactions; 30 min 3 times/week.	RCT 4 weeks	R: 36 S: -	Cm: NPI apathy NPS: total NPI	None
Spector *et al.*, 2003	T: CST, 14 group sessions; 45 min/session, twice a week C: Usual activities	RCT 7 weeks	R: 201 S: -	Cm: HCS NPS: CAPE-BRS; RAID	None
Cott *et al.*, 2002	T: Walk-and-talk intervention in resident pairs; 30 min 5 times/week C_1: One-on-one conversation with RA; 30 min 5 times/week C_2: Usual activities	RCT 16 weeks	R: 86 S: -	Cm: FACS NPS: LPRS-SIB	None
Haight *et al.*, 2006	T: Life review delivered by care assistants; approximately 8 h total C: Usual care	RCT 6 weeks	R: 31 S: 15	Cm: COS NPS: MBP	COS ($p < 0.005$)
Toseland *et al.*, 1997	T: Validation therapy group; 30 min 4 times/week C_1: Social contact group, one activity each meeting; 30 min 4 times/week C_2: Usual care	RCT 52 weeks	R: 88 S: -	Cm: MOSES NPS: CMAI-O; CMAI-N; GIPB	CMAI-O verbal aggression ($p < 0.01$; C_1 *vs* $T+C_2$) CMAI-N verbal aggression ($p < 0.01$) physical aggression ($p < 0.001$) physical nonaggression ($p < 0.01$; C_{1+2} *vs* T)
Orrel *et al.*, 2005 (also Spector *et al.*, 2003)	T: Participants in CST groups + maintenance CST sessions C_1: Participants in CST groups + no maintenance CST sessions C_2: No intervention	CT 16 weeks	R: 35 S: -	Cm: HCS NPS: CAPE-BRS	None
Tappen *et al.*, 2002	T: Combined walking and conversation; 30 min 3 times/week C_1: One-on-one conversation; 30 min 3 times/week C_2: Walk-only, self-paced, independent or assisted; 30 min 3 times/week	RCT 16 weeks	R: 55 S: -	Cm: Picture description test	Mean number of information units ($p < 0.043$; C_1 *vs* $T+C_2$) Conciseness score ($p < 0.010$; C_1 *vs* $T+C_2$)
Tabourne, 1995	T: Life review groups; twice a week C: Week 1 and week 12, participation in treatment group. Weeks 2–11, recreation activities similar to those used in Treatment group but without protocol or cueing for reminiscence.	QE-CT 12 weeks	R: 40 S: -	Cm: Observation of behavior during sessions; Sociograms: communication patterns; Changes in attendance and participation during activities NPS: Checklist of general behavior	Decrease of disorientation ($p < 0.001$) Improvement in social interaction ($p < 0.001$)
Tondi *et al.*, 2007	T: Individual and group validation therapy C: Usual care	CT 4 months	R: 60 S: -	Cm: NPI apathy NPS: total NPI	No statistical tests used

*Significant effects in favor of treatment group unless otherwise stated.

C = control group; CAPE-BRS = Clifton Assessment Procedures for the Elderly- Behavior Rating Scale; CAS = Communication Assessment Scale for the Cognitively Impaired; Cm = communication; CMAI-N = Cohen Mansfield Agitation Inventory – Nursing staff-derived; CMAI-O = Cohen Mansfield Agitation Inventory – Observer-derived; COS = Communication Observation Scale for the Cognitively Impaired; CST = Cognitive Stimulation Therapy; CT = controlled trial; FACS = Functional Assessment of Communication Skills for Adults, social communication and communication of basic needs relative to the independence dimension; GIPB = Geriatric Indices of Positive Behavior; HCS = Holden Communication Scale; LPRS-SIB = London Psychogeriatric Rating Scale – Socially Irritating Behavior; MBP = Revised Memory and Behavior Problem Checklist; MOSES = Multidimensional Observation Scale for Elderly Subjects, irritability and withdrawal scales; NPI = Neuropsychiatric Inventory; NPS = neuropsychiatric symptoms; QE-CT = quasi-experimental controlled trial; R = residents; RA = research assistant; RAID = Rating Anxiety in Dementia; RCT = randomized controlled trial; S = care staff; T = treatment group.

The number of participating residents in each study ranged from 30 to 201, and the severity of the dementia ranged from moderate (mean study group Mini-mental State Examination (MMSE) score 18.6) to severe (mean study group MMSE score 6). The intervention period varied from 6 to 52 weeks.

The nine daily-care intervention studies consisted of training programs aimed solely at teaching care staff communication techniques (McCallion *et al.*, 1999; Dijkstra *et al.*, 2002; Magai *et al.*, 2002; Finnema *et al.*, 2005; van Weert *et al.*, 2005; 2006) or multicomponent training or educational programs that also included communication techniques (Edberg and Hallberg, 1996; 2001; Wells *et al.*, 2000; Beck *et al.*, 2002; Burgio *et al.*, 2002). Table 2 shows the study characteristics of the daily-care intervention studies. The numbers of residents varied from 22 to 194, and the numbers of staff members varied from 31 to 124. One study trained specially hired certified nurses to carry out the intervention (Beck *et al.*, 2002). The mean study group MMSE score was less than 10 in four studies, indicating that the participants were in a severe stage of dementia (McCallion *et al.*, 1999; Wells *et al.*, 2000; Burgio *et al.*, 2002; Magai *et al.*, 2002). The other five studies included participants with moderate or mild, as well as severe, dementia. All daily-care intervention studies started with a training period for the care staff. After this period, the intervention was implemented in daily care. Seven studies assessed outcome measures at several times after implementation, varying from 2 weeks to 12 months (Edberg and Hallberg, 1996; 2001; McCallion *et al.*, 1999; Wells *et al.*, 2000; Beck *et al.*, 2002; Burgio *et al.*, 2002; Magai *et al.*, 2002; Finnema *et al.*, 2005). Each of two studies had only one post-intervention assessment of outcomes, which took place at four weeks (Dijkstra *et al.*, 2002) and 18 months (van Weert *et al.*, 2005; 2006).

Methodological quality

There were great differences in the methodological quality of the studies. None of the 19 studies fulfilled all nine quality items. Table 3 shows the results of the quality assessment and the total quality score for each study. The decision whether the criteria were fulfilled or not was based on the information provided in the article, and if this information was inadequate, the decision was labeled "unknown". Overall, the quality of the daily care intervention studies seemed poorer (mean fulfilled criteria 3.7 ± 1.6) than the quality of the set-time studies (mean fulfilled criteria 4.5 ± 2.1).

Effects of the interventions on communication

Five set-time studies, which also had the highest scores for total quality, used quantitative outcome measures for communication that could be compared (Friedman and Tappen, 1991; Cott *et al.*, 2002; Spector *et al.*, 2003; Politis *et al,* 2004; Haight *et al.*, 2006). The data from these studies were pooled in a meta-analysis, and a total of 371 residents with dementia (193 in experimental groups and 178 in control groups) were included. The study by Cott *et al.* (2002) had two control groups, and we combined data from both groups before we entered them in the meta-analysis (Higgins and Green, 2008). Standardized mean differences (SMDs) were calculated, and we chose the random-effects model because of the heterogeneity-of-treatment effects across studies ($\chi^2 = 24.59$, $df = 3$, $p = 0.0001$, $I^2 = 84\%$). The estimated overall effect was not significant for the treatment groups (SMD = 0.53, 95% CI = –0.07–1.14, $p = 0.09$; Figure 1).

Among the set-time studies that were not included in the meta-analysis, a group life review intervention found a significant improvement in social interaction for the experimental group (Tabourne, 1995), and a walk-and-talk intervention showed significant positive effects for the conversation-only group (Tappen *et al.*, 2002). The other three set-time intervention studies did not show any significant effects on communication outcomes.

It was not possible to pool data for communication outcome data for the daily care intervention studies because the only two studies that fulfilled the quality criterion for randomization did not use communication outcomes that were suitable for a meta-analysis (Burgio *et al.*, 2002; Magai *et al.*, 2002).

Four of the daily-care intervention studies included a multicomponent training and education program for care staff that had a communication component (Edberg and Hallberg, 1996; 2001; Wells *et al.*, 2000; Beck *et al.*, 2002; Burgio *et al.*, 2002). Positive effects on communication were found in all of these studies. Effects on interactive behaviors, nurse–patient cooperation style, and nursing assistants maintaining their communication skills were evident for caregivers. Effects on residents were found for positive affect and interactive behavior.

Five studies investigated the effects of communication skill training for care staff. One of these studies did not include a communication measurement (McCallion *et al.*, 1999). The studies that found positive significant effects were an intervention combining a package of

Table 2. Characteristics and findings of daily care studies

AUTHOR/YEAR	INTERVENTION	STUDY DESIGN	N	OUTCOME MEASURES	SIGNIFICANT BETWEEN GROUP EFFECTS*
Magai *et al.*, 2002	T: Training caregivers in nonverbal sensitivity; 2 weeks, 10 times 1h C_1: Behavioral placebo, sessions for caregivers about cognitive and behavioral aspects of dementia; no specific attention to patient affect. C_2: No treatment control group	RCT	R: 99 S: 31	Cm: Facial expressions of emotion during interview for positive and negative affect (R) NPS: CMAI (R)	None
van Weert *et al.*, 2005, 2006	T: NAs were trained in snoezelen by professional trainer; Training: 4 times 4-h in-service sessions and homework. C: Usual care	QE-CT	6 NHs 12 wards	Cm: Eye contact (R + S); Smiling (R + S); Affective touch (S); Positive and negative affective and instrumental verbal communication (R + S)	R: NA-directed gaze ($p < 0.01$) Smiling ($p < 0.05$) Negative affective verbal behavior ($p < 0.05$) S: R-directed gaze, affective touch and smiling ($p < 0.001$) Positive instrumental and affective verbal behavior ($p < 0.001$) Negative instrumental and affective verbal behavior ($p < 0.001$)
Beck *et al.*, 2002	T_1**:** ADL intervention respecting R cognitive and physical abilities carried out by project NA; 45–60 min/day for 12 weeks T_2**:** PSA-intervention involving 25 modules designed to meet psychosocial needs through engagement in meaningful activity; 12 weeks, R eventually participated 30+ min. T_3: Both ADL and PSA interventions; 90+ min/day for 12 weeks C_1: One-to-one interaction with project NA; 30 min/day for 12 weeks C_2: Usual care	CT	R: 179 S: -	Cm: DBS; AARS; Observable displays of affect scale; Positive VAS for affect; Negative VAS for affect	Positive affect ($p < 0.001$) (facial expressions, body posture/movements, contentment, interest)
Burgio *et al.*, 2002	T + C: 4 weeks of behavior management training with knowledge and performance-based assessments of skill acquisition. T: Formal staff management after training phase including additional training and feedback from supervisory care staff C: Usual supervisory system after completing training phase	RCT	R: 88 S: 106	Cm: Occurrences of residents and staff interaction behaviors; BMSC (S) NPS: CMAI (R)	S: maintaining communication skills more effectively 6 months after training ($p < 0.05$)
Finnema *et al.*, 2005	T: Emotion-oriented care applied by trained NAs; 9 months C: Usual care	CT**	14 NH's 16 wards R: 194 S: 124	Cm: Questionnaire social Relationships (R) NPS: CMAI (R) BOS-IP (R)	None

Wells *et al.*, 2000	T: Educational program for caregivers; 5 20–30 min sessions C: Usual care	QE-CT	R: 56 S: 44	Cm: MIBM (R) IBM (S) NPS: PAS (R) LPRS (R)	R: MIBM ($p < 0.046$) (more positive and appropriate interactions) PAS ($p < 0.019$) NA: Interactive behaviors ($p < 0.005$) (verbal relevance, personal-attending, relaxed, and social/flexible behaviors)
McCallion *et al.*, 1999	T: NAs communication skills program; 5 45-min group sessions and 4 individual conferences of 30 min each C: No intervention	CT***	R: 105 S: 88	Cm: MOSES (R) NPS: CMAI (R)	CMAI physical nonaggressive behavior ($p < 0.001$) CMAI verbal aggressive behavior ($p < 0.001$)
Edberg *et al.*, 1996; 2001	T: Implementation of supervised individualized planned care C: Usual care	QE-CT	R: 22 S: 39	Cm: Nurse–patient cooperation style from morning care observation NPS: DBAS (R); MDDAS (R)	Nurse–patient cooperation style ($p < 0.001$)
Dijkstra *et al.*, 2002	T: Package of communication enhancing strategies, including memory books and a communication intervention for NAs C: Not mentioned	CT	R: 66 S: 40	Cm: Discourse characteristics from transcripts of conversations between R and NA	Discourse characteristics R: ($p < 0.05$) (information units, indefinite and unique words, repetitions) S: ($p < 0.02$) (more facilitators,encouragement, cues)

*Significant effects in favor of treatment group unless otherwise stated; **Multi-sited, matched groups; ***Randomized by nursing home unit.
AARS = Apparent affect rating scale; ADL = Activities of daily living; BMSC: Behavior Management Skills Checklist; BOS-IP = Behavior Observational Scale for Intramural Psychogeriatrics; C = Control group; Cm = Communication CMAI = Cohen Mansfield Agitation Index; CT = Controlled trial; DBAS = Demanding Behavior Assessment Scale; DBS = Disruptive behavior scale; IBM = Interaction Behavior Measure; LPRS = London Psychogeriatric Rating Scale; MDDAS = Multi-Dimensional Dementia Assessment Scale two subscales used: behavior and psychiatric symptoms; MIBM = Modified Interaction Behavior Measure; MOSES = Multidimensional Observation Scale for Elderly Subjects; NA: Nursing assistant; NH = Nursing home; NPS = Neuropsychiatric symptoms; PAS = Pittsburgh Agitation Scale; PSA = Psychosocial activity; QE-CT: Quasi-experimental controlled trial; R = Residents; RCT = Randomized controlled trial; S = Care staff; T = Treatment group; VAS = Visual Analogue Scale.

Table 3. Quality assessment and total score of included studies

	A	B	C	D	E	F	G	H	I	TOTAL
Set-time studies										
Friedman and Tappen, 1991	+	+	+	+	u	+	+	+	+	**8**
Politis *et al.*, 2004	+	+	+	−	+	+	+	u	+	**7**
Spector *et al.*, 2003	+	+	+	+	u	−	+	+	u	**6**
Cott *et al.*, 2002	+	+	+	−	−	−	−	+	+	**5**
Haight *et al.*, 2006	+	u	−	u	u	+	+	+	+	**5**
Toseland *et al.*, 1997	+	u	−	u	+	+	u	u	+	**4**
Orrel *et al.*, 2005	−	−	+	−	u	+	+	−	u	**3**
Tappen *et al.*, 2002	+	u	+	u	u	−	u	−	+	**3**
Tabourne, 1995	−	−	+	+	u	−	−	u	−	**2**
Tondi *et al.*, 2007	−	−	−	+	u	−	u	−	+	**2**
Daily care studies										
van Weert *et al.*, 2005; 2006	−	−	+	+	+	+	−	+	+	**6**
Magai *et al.*, 2002	+	u	−	+	+	+	+	u	+	**6**
Beck *et al.*, 2002	−	u	+	−	+	−	−	+	+	**4**
Burgio *et al.*, 2002	+	u	+	+	u	+	u	u	u	**4**
Finnema *et al.*, 2005	−	−	+	+	−	−	−	+	+	**4**
Wells *et al.*, 2000	−	−	+	−	+	−	−	u	+	**3**
McCallion *et al.*, 1999	−	−	−	u	+	−	u	u	+	**2**
Dijkstra *et al.*, 2002	−	u	−	−	u	+	+	u	u	**2**
Edberg *et al.*, 1996; 2001	−	−	−	+	u	−	+	u	u	**2**

Quality criteria: A = randomization, B = allocation concealment, C = inclusion/exclusion criteria specified, D = similarity of groups at baseline, E = assessors blinded to outcome, F = characteristics of participants lost to follow-up described, G = intention-to-treat analysis, H = power calculated, I = outcome measures valid.
+ = criterion fulfilled, − = criterion not fulfilled, u = unknown if criterion is fulfilled.

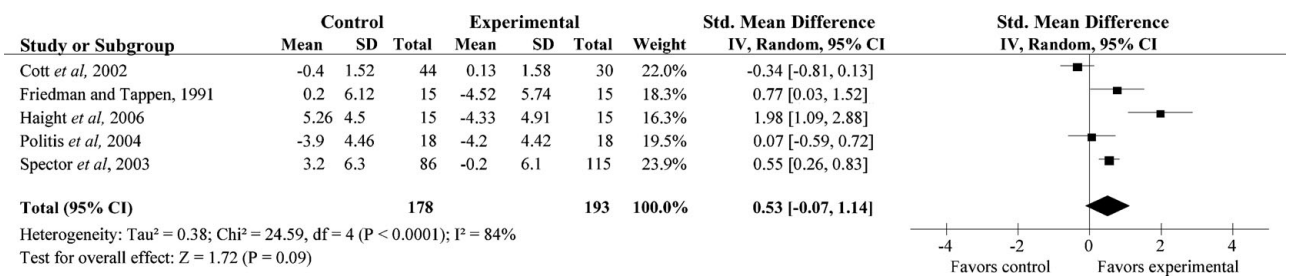

Figure 1. Forest plot, which shows no significant overall effect of set-time studies on communication outcomes.
Each study is represented by a *black square* (■) and a horizontal line, which correspond to the point estimate and the 95% confidence intervals (CIs) of the standardized mean difference (SMD). The *solid vertical line* corresponds to no effect of treatment (SMD 0). The area of the *black squares* reflects the weight of the study in the meta-analysis. The *diamond* (◆) represents the combined SMD, calculated in a random effects model with its 95% CI.
df = degrees of freedom; Mean = the mean change in communication outcome and the corresponding standard deviation (SD) for patients in the control and experimental groups, respectively; Total = number of patients included in analysis.

communication-enhancing strategies and memory books for nursing assistants (Dijkstra *et al.*, 2002) and an intervention integrating snoezelen in 24-hour dementia care (van Weert *et al.*, 2005; 2006). The first study found effects on discourse characteristics for residents and care staff. Snoezelen aims to communicate at a nonverbal level through the stimulation of the primary senses. Teaching care staff applying these techniques during morning care proved to be effective, even for residents with moderate-to-severe dementia.

The study of Magai *et al.* (2002) showed no significant effect on communication outcomes after 12 weeks. However, a sharp increase in positive affect was reported for the intervention group in the first six weeks after the training and the authors suggest that training programs should include refresher sessions in order to remain effective.

Effects of the interventions on neuropsychiatric symptoms

Data for effects on neuropsychiatric symptoms in four set-time studies were pooled (Toseland *et al.*, 1997; Spector *et al.*, 2003; Politis *et al.*, 2004; Haight *et al.*, 2006). Two of these studies

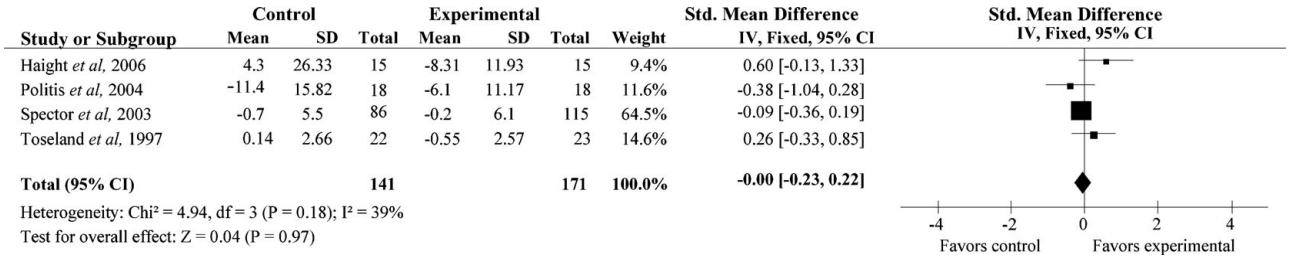

Figure 2. Forest plot, which shows no significant overall effect of set-time studies on neuropsychiatric outcomes.
Each study is represented by a *black square* (■) and a horizontal line, which correspond to the point estimate and the 95% confidence intervals (CIs) of the standardized mean difference (SMD). The *solid vertical line* corresponds to no effect of treatment (SMD 0). The area of the *black squares* reflects the weight of the study in the meta-analysis. The *diamond* (◆) represents the combined SMD, calculated in a fixed effects model with its 95% CI.
df = degrees of freedom; Mean = the mean change in communication outcome and the corresponding standard deviation (SD) for patients in the control and experimental groups, respectively; Total = number of patients included in analysis.

had also been included in the meta-analysis for communication outcomes, and the total score for quality was 4 or more for all four studies.

A total of 312 residents with dementia (171 in experimental groups and 141 in control groups) were included in the meta-analysis. We calculated the SMDs for this meta-analysis, and we used a fixed-effects model because the test for statistical heterogeneity was not significant ($\chi^2 = 4.94$, $df = 3$, $p = 0.18$, $I^2 = 39.2\%$). The result was that the estimated overall effect on neuropsychiatric symptoms was zero (SMD = 0.00, 95% CI = –0.23–0.22, $p =$ 0.97; Figure 2).

Among the studies unsuitable for meta-analysis, a group life review intervention found a significant decrease of disorientation for the experimental group (Tabourne, 1995), and a combined group-and-individual validation therapy intervention found a decrease of the mean neuropsychiatric inventory score in the treatment group and a slight increase in the control group, but no statistical test for significance was used (Tondi *et al.*, 2007). Two studies did not include a measurement for neuropsychiatric symptoms (Friedman and Tappen, 1991; Tappen *et al.*, 2002).

It was impossible to pool data for neuropsychiatric symptom outcomes within the subset of daily care intervention studies. The two studies that fulfilled the quality criterion for randomization used the Cohen-Mansfield Agitation Inventory as an outcome measure, but neither reported separate results for this questionnaire (Burgio *et al.*, 2002; Magai *et al.*, 2002).

The only two studies that found significant positive effects on neuropsychiatric symptoms were an abilities-focused program (Wells *et al.*, 2000), and a program of communication skills for nursing assistants (McCallion *et al.*, 1999).

The training of care staff led to positive effects on residents' calm-functional behavior, agitation behavior, and physically nonaggressive behavior assessed after three months, and verbally aggressive behavior assessed after three and six months. Other daily care intervention studies did not find significant effects (Edberg and Hallberg, 1996; 2001; Beck *et al.*, 2002; Burgio *et al.*, 2002; Magai *et al.*, 2002) or did not include a scale for measuring effects on the neuropsychiatric symptoms of the residents (Dijkstra *et al.*, 2002; van Weert 2005; 2006).

Discussion

A total of 19 intervention studies fulfilled the inclusion criteria for this review and two overall types of interventions were identified: structured and communicative sessions at set-times, and communication techniques in activities of "daily care". The latter include training programs for care staff. A meta-analysis of five set-time interventions (communication) and another meta-analysis of four set-time interventions (neuropsychiatric outcomes) found no significant overall effects. Positive effects for communication outcomes are shown in individual studies when set-time interventions are single-task sessions, such as life review or one-on-one conversation, and when care staff apply communication techniques in daily care activities. The effect of both types of communication interventions on the neuropsychiatric symptoms of people with dementia is divergent.

The difference in effectiveness between single- and multi-task interventions might be explained by people with dementia having difficulty performing dual tasks (Petterson *et al.*, 2007). Furthermore, exercise may not benefit the cognitive functioning of people with dementia when cardiovascular risk factors are present (Eggermont *et al.*, 2006). Tappen and colleagues' study (2002) reported that participants were afraid of falling and needed considerable assistance with ambulation, or stopped walking when they were asked a question.

The positive results for the life review interventions are consistent with findings of a review on the effectiveness of reminiscence therapy on dementia patients, which suggested some potential benefits such as improvements in cognition (Woods *et al.*, 2005). People with dementia are still able to recall memories from past life events, with the more important life events often being remembered quite clearly, even in the severe stages of the disease (Fromholt and Larsen, 1991). Reminiscence, or life reflection, is therefore a sensible and simple strategy for improving communication between residents and staff.

Training programs for care staff to be used in daily care have positive effects on verbal and nonverbal communication outcomes among care staff as well as residents with dementia. It is known that factors increasing the effectiveness of an educational or training program for healthcare professionals are longer training periods, active participation during the training, and individual attention (Grol and Wensing, 2006). We indeed found that effective programs used interactive courses (Edberg and Hallberg, 1996; 2001; Wells *et al.*, 2000), a little self-study (Edberg and Hallberg, 1996; 2001; Wells *et al.*, 2000) and individual attention via a supervisory system (Burgio *et al.*, 2002). The results of the study of Magai *et al.* (2002) add to this knowledge in showing that training programs should include refresher sessions to remain effective.

In spite of the effects on communication, the effects of both types of communicative interventions on neuropsychiatric symptoms were marginal. This is remarkable since communication difficulties are associated with neuropsychiatric symptoms (Potkins *et al.*, 2003). If so, one would expect positive effects on neuropsychiatric symptoms in the studies included in this review. In most studies either no effects on behavior were found or no outcome measure for neuropsychiatric symptoms were included. Only four out of the 19 studies found positive effects for specific problematic behaviors in residents. Only one study found positive effects on both communication and neuropsychiatric symptoms. This particular study used a quasi-experimental design and only fulfilled three of the nine methodological quality criteria, so it was difficult to draw a conclusion (Wells *et al.*, 2000).

The two daily care interventions that had the best methodological quality both studied the effects of nonverbal communication techniques on communication between residents and care staff (van Weert *et al.*, 2005; 2006; Magai *et al.*, 2002). The snoezelen study showed positive effects for communication outcomes.

Methodological weaknesses were common in most of the research projects and the methodological quality of the studies was generally poor. The quality of the set-time studies was better than the quality of the daily care interventions, but the variability was too great to draw overall conclusions. As for the results of the meta-analyses and conclusions of this review, the following should be kept in mind. First, given the kinds of intervention studies we reviewed, it was not possible to blind the residents, care staff, or therapists in the treatment groups. To get reliable and objective data, it is important to at least blind the outcome assessors (Egger *et al.*, 1997). Unfortunately, for seven set-time studies, it remains unclear whether this was done properly (Friedman and Tappen, 1991; Tabourne, 1995; Tappen *et al.*, 2002; Spector *et al.*, 2003; Orrell *et al.*, 2005; Haight *et al.*, 2006; Tondi *et al.*, 2007).

Second, both the quality criteria for random assignment and allocation concealment were fulfilled for only four set-time studies (Friedman and Tappen, 1991; Cott *et al.*, 2002; Spector *et al.*, 2003; Politis *et al.*, 2004) and none of the daily care intervention studies. Using the Cochrane criteria, only two of the daily care intervention studies used a truly random method to assign participants to study groups (Higgins and Green, 2008). Therefore, it was impossible to pool data for daily care intervention studies.

Third, the reliability and validity of the outcome measures that were used for communication were questionable. The validation of outcome measures in some studies included in this review was not justified, or instruments were specially developed and evaluated for the study (Tabourne, 1995; Edberg and Hallberg, 1996; 2001; Burgio *et al.*, 2002; Dijkstra *et al.*, 2002; Spector *et al.*, 2003; Orrell *et al.*, 2005).

However, these reservations apart, we conclude that there are promising effective psychosocial interventions to be used in residential settings. Moreover, the lack of effect on the neuropsychiatric symptoms of residents with dementia is no reason to preclude improving communication in high-level residential care facilities. Instead of measuring effects on neuropsychiatric problems, researchers might think about improvements that retain the positive behaviors of the people in care. Some papers in this review describe improvements in positive behaviors of affect and mood (Beck *et al.*, 2002; Haight *et al.*, 2006), but our results for neuropsychiatric symptoms might not be significant because they included negative behaviors (e.g. agitation) that did not, and perhaps cannot, improve (Magai *et al.*, 2002; Burgio *et al.*, 2002; Finnema *et al.*, 2005).

This review indicates that care staff can improve their communication with residents with dementia when strategies are embedded in daily care activities or interventions are single-task sessions at set times. Staff training should include time for personal feedback, interactive learning and refresher sessions. These results offer the possibility of improving the quality of care, but not directly of reducing neuropsychiatric symptoms. More research is needed to study the effect of communication interventions on neuropsychiatric symptoms.

Conflict of interest

None.

Description of authors' roles

E. Vasse formulated the research question, carried out the search strategy, assessed the methodological quality of the studies, analyzed the data, and wrote the paper. M. Vernooij-Dassen assisted with formulating the research question, analyzing the data, and writing the paper. A. Spijker assessed the methodological quality of the studies. M. Olde Rikkert and R. Koopmans assisted with writing the paper.

Acknowledgments

We are grateful to Dr Irena Draskovic, Senior Researcher, who used her technical and statistical skills to help us use Review Manager 5.

References

Beck, C. K. *et al.* (2002). Effects of behavioral interventions on disruptive behavior and affect in demented nursing home residents. *Nursing Research*, 51, 219–228.

Brodaty, H., Draper, B. and Low, L. F. (2003a). Nursing home staff attitudes towards residents with dementia: strain and satisfaction with work. *Journal of Advanced Nursing*, 44, 583–590.

Brodaty, H., Green, A. and Koschera, A. (2003b). Meta-analysis of psychosocial interventions for caregivers of people with dementia. *Journal of the American Geriatrics Society*, 51, 657–664.

Buhr, G. T., Kuchibhatla, M. and Clipp, E. C. (2006). Caregivers' reasons for nursing home placement: clues for improving discussions with families prior to the transition. *Gerontologist*, 46, 52–61.

Burgio, L. D., Stevens, A., Burgio, K. L., Roth, D. L., Paul, P. and Gerstle, J. (2002). Teaching and maintaining behavior management skills in the nursing home. *Gerontologist*, 42, 487–496.

Cott, C. A., Dawson, P., Sidani, S. and Wells, D. (2002). The effects of a walking/talking program on communication, ambulation, and functional status in residents with Alzheimer disease. *Alzheimer Disease and Associated Disorders*, 16, 81–87.

de Klerk, M. M. Y. (2001). *Report on the Elderly 2001*. The Hague: The Netherlands Institute for Social Research.

Dijkstra, K., Bourgeois, M., Burgio, L. and Allen, R. (2002). Effects of a communication intervention on the discourse of nursing home residents with dementia and their nursing assistants. *Journal of Medical Speech-Language Pathology*, 10, 143–157.

Edberg, A. K. and Hallberg, I. R. (1996). Effects of clinical supervision on nurse-patient cooperation quality: a controlled study in dementia care. *Clinical Nursing Research*, 5, 1271–46.

Edberg, A. K. and Hallberg, I. R. (2001). Actions seen as demanding in patients with severe dementia during one year of intervention: comparison with controls. *International Journal of Nursing Studies*, 38, 271–285.

Egger, M., Smith, G. D. and Phillips, A. N. (1997). Meta-analysis: principles and procedures. *BMJ*, 315, 1533–1537.

Eggermont, L., Swaab, D., Luiten, P. and Scherder, E. (2006). Exercise, cognition and Alzheimer's disease: more is not necessarily better. *Neuroscience and Biobehavioral Reviews*, 30, 562–575.

Engelborghs, S. *et al.* (2005). Neuropsychiatric symptoms of dementia: cross-sectional analysis from a prospective, longitudinal Belgian study. *International Journal of Geriatric Psychiatry*, 20, 1028–1037.

Finnema, E. *et al.* (2005). The effect of integrated emotion-oriented care versus usual care on elderly persons with dementia in the nursing home and on nursing assistants: a randomized clinical trial. *International Journal of Geriatric Psychiatry*, 20, 330–343.

Friedman, R. and Tappen, R. M. (1991). The effect of planned walking on communication in Alzheimer's disease. *Journal of the American Geriatrics Society*, 39, 650–654.

Fromholt, P. and Larsen, S. F. (1991). Autobiographical memory in normal aging and primary degenerative dementia (dementia of Alzheimer type). *Journal of Gerontology*, 46, 85–91.

Grol, R. and Wensing, M. (2006). *Implementatie. Effectieve verbetering van de patiëntenzorg* [*Implementation. Effective Improvement of Patient Care*]. Maarssen: Elsevier Gezondheidszorg.

Haight, B. K., Gibson, F. and Michel, Y. (2006). The Northern Ireland life review/life storybook project for people with dementia. *Alzheimer's and Dementia*, 2, 56–58.

Hancock, G. A., Woods, B., Challis, D. and Orrell, M. (2006). The needs of older people with dementia in residential care. *International Journal of Geriatric Psychiatry*, 21, 43–49.

Higgins, J. P. T., and Green, S. (eds.). (2008). *Cochrane Handbook for Systematic Reviews of Interventions*, Version 5.0.1 (updated September 2008). The Cochrane Collaboration. Available at www.cochrane-handbook.org.

Hope, T., Keene, J., Gedling, K., Fairburn, C. G. and Jacoby, R. (1998). Predictors of institutionalization for

people with dementia living at home with a carer. *International Journal of Geriatric Psychiatry*, 13, 682–690.

Livingston, G., Johnston, K., Katona, C., Paton, J. and Lyketsos, C. G. (2005). Systematic review of psychological approaches to the management of neuropsychiatric symptoms of dementia. *American Journal of Psychiatry*, 162, 1996–2021.

Lyketsos, C. G., Lopez, O., Jones, B., Fitzpatrick, A. L., Breitner, J. and DeKosky, S. (2002). Prevalence of neuropsychiatric symptoms in dementia and mild cognitive impairment: results from the cardiovascular health study. *JAMA*, 288, 1475–1483.

Magai, C., Cohen, C. I. and Gomberg, D. (2002). Impact of training dementia caregivers in sensitivity to nonverbal emotion signals. *International Psychogeriatrics*, 14, 25–38.

McCallion, P., Toseland, R. W., Lacey, D. and Banks, S. (1999). Educating nursing assistants to communicate more effectively with nursing home residents with dementia. *Gerontologist*, 39, 546–558.

Novak, M. and Chappell, N. L. (1996). The impact of cognitively impaired patients and shift on nursing assistant stress. *International Journal of Aging and Human Development*, 43, 235–248.

Orrell, M., Spector, A., Thorgrimsen, L. and Woods, B. (2005). A pilot study examining the effectiveness of maintenance Cognitive Stimulation Therapy (MCST) for people with dementia. *International Journal of Geriatric Psychiatry*, 20, 446–451.

Petterson, A. F., Olsson, E. and Wahlund, L. O. (2007). Effect of divided attention on gait in subjects with and without cognitive impairment. *Journal of Geriatric Psychiatry and Neurology*, 20, 58–62.

Politis, A. M., Vozzella, S., Mayer, L. S., Onyike, C. U., Baker, A. S. and Lyketsos, C. G. (2004). A randomized, controlled, clinical trial of activity therapy for apathy in patients with dementia residing in long-term care. *International Journal of Geriatric Psychiatry*, 19, 1087–1094.

Potkins, D. *et al.* (2003). Language impairment in dementia: impact on symptoms and care needs in residential homes. *International Journal of Geriatric Psychiatry*, 18, 1002–1006.

Schneider, L. S., Dagerman, K. S. and Insel, P. (2005). Risk of death with atypical antipsychotic drug treatment for dementia: meta-analysis of randomized placebo-controlled trials. *JAMA*, 294, 1934–1943.

Snowdon, J., Day, S. and Baker, W. (2006). Current use of psychotropic medication in nursing homes. *International Psychogeriatrics*, 18, 241–250.

Spector, A. *et al.* (2003). Efficacy of an evidence-based cognitive stimulation therapy programme for people with dementia: randomised controlled trial. *British Journal of Psychiatry*, 183, 248–254.

Spijker, A. *et al.* (2008). Effectiveness of nonpharmacological interventions in delaying the institutionalization of patients with dementia: a meta-analysis. *Journal of the American Geriatrics Society*, 56, 1116–1128.

Tabourne, C. E. (1995). The effects of a life review program on disorientation, social interaction and self-esteem of nursing home residents. *International Journal of Aging and Human Development*, 41, 251–266.

Tappen, R. M., Williams, C. L., Barry, C. and DiSesa, D. (2002). Conversation intervention with Alzheimer's patients: Increasing the relevance of communication. *Clinical Gerontologist*, 24, 63–75.

Tondi, L., Ribani, L., Bottazzi, M., Viscomi, G. and Vulcano, V. (2007). Validation therapy (VT) in nursing home: a case-control study. *Archives of Gerontology and Geriatrics*, 44, S407–S411.

Toseland, R. W., Diehl, M., Freeman, K., Manzanares, T., Naleppa, M. and McCallion, P. (1997). The impact of validation group therapy on nursing home residents with dementia. *Journal of Applied Gerontology*, 16, 31–50.

van Weert, J. C., van Dulmen, A. M., Spreeuwenberg, P. M., Ribbe, M. W. and Bensing, J. M. (2005). Effects of snoezelen, integrated in 24 h dementia care, on nurse-patient communication during morning care. *Patient Education and Counseling*, 58, 312–326.

van Weert, J. C., Janssen, B. M., van Dulmen, A. M., Spreeuwenberg, P. M., Bensing, J. M. and Ribbe, M. W. (2006). Nursing assistants' behaviour during morning care: effects of the implementation of snoezelen, integrated in 24-hour dementia care. *Journal of Advanced Nursing*, 53, 656–668.

Verkaik, R., van Weert, J. C. M. and Francke, A. L. (2005). The effects of psychosocial methods on depressed, aggressive and apathetic behaviors of people with dementia: a systematic review. *International Journal of Geriatric Psychiatry*, 20, 301–314.

Wancata, J., Musalek, M., Alexandrowicz, R. and Krautgartner, M. (2003). Number of dementia sufferers in Europe between the years 2000 and 2050. *European Psychiatry*, 18, 306–313.

Wells, D. L., Dawson, P., Sidani, S., Craig, D. and Pringle, D. (2000). Effects of an abilities-focused program of morning care on residents who have dementia and on caregivers. *Journal of the American Geriatrics Society*, 48, 442–449.

Woods, B., Spector, A., Jones, C., Orrell, M. and Davies, S. (2005). Reminiscence therapy for dementia. *Cochrane Database of Systematic Reviews*, 2, CD001120.

Zuidema, S. U., Derksen, E., Verhey, F. R. J. and Koopmans, R. T. (2007). Prevalence of neuropsychiatric symptoms in a large sample of Dutch nursing home patients with dementia. *International Journal of Geriatric Psychiatry*, 22, 632–638.