

Review Article

Speech-Language Pathologist Interventions for Communication in Moderate–Severe Dementia: A Systematic Review

Katina Swan,^a Marie Hopper,^a Rachel Wenke,^{a,b,c} Claire Jackson,^a Tracy Till,^a and Erin Conway^d

Purpose: The purpose of this study is to evaluate the evidence for direct and indirect interventions for communication in people with moderate–severe dementia.

Method: A systematic search of the literature was conducted, as per the Preferred Reporting Items for Systematic Reviews and Meta-Analysed guidelines, across 8 electronic databases. Studies were included if they included direct or indirect interventions, which could be administered by a speech-language pathologist to people with moderate–severe dementia (defined as having Mini-Mental State Examination of ≤ 15 ; Folstein, Folstein, & McHugh, 1975). Studies also were required to include outcome measures, which reported on communication function or participation and/or well-being related to communication. Included studies were evaluated for methodological quality using the McMaster critical appraisal tool (Law et al., 1998).

Results: Eleven studies met the inclusion criteria. Ten of these studies related to direct interventions and included cognitive stimulation approaches using group ($n = 5$) or

individual therapy ($n = 1$); cognitive training, including naming therapy ($n = 1$) and spaced retrieval training ($n = 1$); and cognitive rehabilitation approaches using augmentative and alternative communication ($n = 2$). One study reported an indirect intervention: conversation partner training. Due to the heterogeneity of studies, a meta-analysis was unable to be conducted. A descriptive synthesis of results indicated that interventions generally resulted in positive changes to communication and related quality-of-life outcomes compared with baseline or control groups.

Conclusions: Preliminary evidence was found to support communication interventions for people with moderate–severe dementia. The use of cognitive stimulation approaches, which use a group treatment model and conversation, as a therapy medium show promise as direct intervention options. Implications for clinical practice for speech-language pathologists and future research are discussed.

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Dementia is an umbrella term for a group of conditions that affect various aspects of cognition, such as memory, language, or learning, due to the death of neurons in the brain (Alzheimer's Association,

2014). There is an estimated 35.6 million people affected by dementia globally, with prevalence expected to almost double every 20 years (Prince et al., 2013). All types of dementia present with some form of communication impairment, including progressive degeneration of expressive and receptive language, pragmatics and/or speech fluency, which can ultimately progress to a loss of functional communication (Ash et al., 2012; Henry, Phillips, & Von Hippel, 2014; Woodward, 2013). This can negatively impact a person's quality of life (QoL), lead to "responsive behaviors" and result in increased caregiver burden (Savundranayagam, Hummert, & Montgomery, 2005). Responsive behaviors, including aggression, frustration, repeated questioning, and cursing, that may arise from reduced communication function can be extremely distressing for the caregiver and affect relationship quality and well-being of both the caregiver and the person with dementia (PWD; Savundranayagam et al., 2005). These behaviors are typically more pronounced as the disease progresses.

^aGold Coast Health, Speech Pathology Service, Southport, Queensland, Australia

^bGold Coast Health, Clinical Governance, Education and Research (Allied Health), Southport, Queensland, Australia

^cSchool of Allied Health Sciences, Griffith University (Adjunct Appointment), Gold Coast, Queensland, Australia

^dSchool of Allied Health, Australian Catholic University, Banyo, Queensland

Katina Swan is now at the School of Occupational Therapy, Social Work, and Speech Pathology at Curtin University, Bentley, Western Australia

Correspondence to Rachel Wenke: Rachel.Wenke@health.qld.gov.au

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Speech-language pathologist (SLP) intervention may actively enhance communication function and resultant well-being of PWD and their carers, with professional bodies advocating that SLPs play a central role in the treatment of communication in PWD throughout disease progression (American Speech-Language-Hearing Association [ASHA], 2017a; Royal College of Speech and Language Therapists [RCSLT], 2014). Despite this recognition within the profession, SLPs report that other professions often do not value the impact SLP interventions may have on communication function in dementia, resulting in underutilization of SLPs in dementia care to enhance communication function (Paul & Mehrhoff, 2015), particularly in the more advanced stages. To increase the perceived value of SLP services in enhancing communication in dementia, SLPs must be supported to provide evidence-based treatment for PWD who seek out or are referred to SLP services for rehabilitation across the continuum of the disease.

Consideration of the effectiveness of the intervention and severity of the patient disease together with a person's strengths, desires, and rights are also important components of patient-centered care (Kim & Park, 2017, p. 1). Consequently, treatment approaches, which may be effective for persons with mild-moderate dementia, cannot be assumed to be appropriate for a person with a more severe dementia. Consideration should therefore be given to the appropriateness and effectiveness of the type of direct and indirect interventions across different stages and resultant severities of the disease. Recently, intervention approaches targeting cognitive communication in dementia have been classified as cognitive training, cognitive rehabilitation, or cognitive stimulation approaches (Bahar-Fuchs, Clare, & Woods, 2013). *Cognitive training* refers to impairment-based structured tasks, which predominately use a restorative approach to improve or maintain specific cognitive domains, whereas cognitive rehabilitation uses a combination of restorative and compensatory approaches to enhance performance and functioning in relation to collaboratively set personalized goals (Bahar-Fuchs et al., 2013). Thirdly, *cognitive stimulation* refers to interventions that provide enjoyable activities to promote socialization and general stimulation of cognitive domains usually in a small group setting (Woods, Aguirre, Spector, & Orrell, 2012).

Recent systematic reviews report positive communication outcomes for both direct and indirect cognitive communication interventions, including cognitive training approaches, such as spaced retrieval training (Hopper et al., 2013; Oren, Willerton, & Small, 2014); cognitive stimulation approaches, including reminiscence therapy (Aguirre, Woods, Spector, & Orrell, 2013); and other caregiver communication skills training programs (Eggenberger, Heimerl, & Bennett, 2013), caregiver communication techniques, and communication activities (Vasse, Vernooij-Dassen, Spijker, Rikkert, & Koopmans, 2010). However, a limitation of systematic reviews to date (Eggenberger et al., 2013; Hopper et al., 2013; Olazarán et al., 2010) is that participants and/or outcomes of interventions have not always been clearly differentiated by dementia severity

or disease progression, or, in cases where correlation between disease severity and performance measures has been clearly presented, studies included only mild to mild-moderate dementia, resulting in limited clinical applicability of the evidence to people with more advanced dementias (i.e., moderate-severe dementia; Oren et al., 2014). Therefore, it currently remains difficult to identify which intervention options may be effective for people in the moderate-severe stage of dementia. This is problematic, considering that SLPs already report reduced confidence in selecting treatment options for people with more advanced dementia (Paul & Mehrhoff, 2015).

Currently, PWD represent the third largest caseload for SLPs working in health care in the United States (ASHA, 2017b), with prevalence rates expected to increase. In order to provide patient-centered and evidence-based care to individuals with dementia, clinicians must be aware of which intervention options are most appropriate for individuals across varying disease severity, including the more advanced stages. Current reviews do not provide a clear understanding of the evidence for communication interventions specifically for people with moderate-severe dementia. A synthesis of the current evidence regarding communication interventions for people with moderate-severe dementia is therefore needed to guide SLP practice and future research directions in this area.

Purpose of the Review

Clinical Questions

The current systematic review aims to answer the following questions:

1. What is the evidence for direct communication interventions targeting communication function and/or communication-related participation and well-being, which can be administered by SLPs for people with moderate-severe dementia?
2. What is the evidence for indirect communication interventions targeting communication function and/or communication-related participation and well-being, which can be administered by SLPs for people with moderate-severe dementia?

In the current review, direct interventions are considered those conducted face-to-face with the PWD. They may use techniques or methods that facilitate learning and retention of information and skills or that facilitate and support conversation or verbal output. Indirect interventions are not delivered directly to the PWD. They aim to address activity and participation limitations related to communication, typically by involving caregivers and/or making environmental modifications (Hopper, 2001; Zientz et al., 2007).

Method

A review protocol was registered on PROSPERO (protocol number PROSPERO 2015: CRD42015030224) and

with the study conducted as per Preferred Reporting Items for Systematic Reviews and Meta-Analysed guidelines.

Data Sources and Search Strategies

A systematic search was conducted in July 2015 and updated in June 2017 using the following nine electronic databases: Medline, Embase, CINAHL, Cochrane Library, Web of Science, Proquest dissertations, Speech bite, PEDro, and OTseeker. The search strategy was built around keywords related to dementia, Alzheimer's disease, fronto-temporal lobar degeneration, speech/language rehabilitation, cognitive-linguistics, and SLP treatment. The specific strategy used to search Medline is found in the Supplemental Material S1. This strategy was adapted to search other databases. The search was restricted to English language and to literature published between 1990 and June 19, 2017. The search strategy from our original protocol was changed to include studies prior to 2000, as checking reference lists of included articles identified additional studies published prior to 2000 that met our review criteria.

Study Selection

To be included in the review, studies had to meet the following inclusion criteria: (a) report on direct or indirect communication intervention/s, which could be planned, delivered, or administered by an SLP; (b) report on outcome measures pertaining to language, engagement in communicative acts, participation in communication, and/or communication-related well-being; and (c) include participants with a diagnosis of moderate-severe dementia. Participants were classified as having moderate-severe dementia if the study reported a mean total participant group score of 15 or less on the Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975), or where individual data could be extracted, individual MMSE was 15 or less. As the MMSE is a scale that uses whole numbers, when studies provided decimal scores, they were rounded down from the nearest decimal (e.g., 15.5 rounded down to 15) and considered to be part of the whole number preceding the decimal point. The criterion for moderate-severe impairment was based on the median score from the moderate range impairment described by Pernecky et al. (2006). Where an MMSE score was not reported in the study, severity was ascertained by any standardized assessment reported (e.g., Dementia Rating Scale-Second Edition; Mattis, Jurica, & Leitten, 2001) and/or if the participants met the criteria for a moderate or severe major neurocognitive impairment within the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (American Psychiatric Association, 1994). All empirical study designs were included in the review.

Studies were excluded if they (a) did not include participants with moderate-severe dementia or included a range of severities from which outcomes for people with moderate-severe dementia could not be isolated; (b) included participants with other disorders (e.g., stroke) in addition to dementia and/or if outcomes of the PWD were

unable to be isolated; (c) did not include data from outcome measures related to communication or well-being; (d) full text was unavailable; and (e) interventions were unable to be administered by an SLP.

The titles and/or abstracts of all articles were screened by two independent reviewers. Abstracts accepted by both reviewers were retrieved in full text, which were also independently screened by two reviewers. Where there was disagreement between the reviewers, ratings were discussed until consensus was reached. When consensus was not possible, a third author was consulted.

Data Extraction

Included studies were independently reviewed by two authors who extracted information on participants (e.g., age and dementia severity), interventions (e.g., type of intervention, dosage, and setting), outcome measure characteristics, and main findings.

Risk of Bias

Each study was classified according to the National Health and Medical Research Council (NHMRC) levels of evidence (NHMRC, 2009) and independently evaluated for methodological rigor by two authors using the standardized McMaster Critical Review Form for Quantitative Studies (Law et al., 1998). The McMaster Critical Review Form contains 15 yes/no questions in relation to the study purpose, justification of need of the study, appropriateness of design, sampling, sample size, reliability and validity of outcome measures, intervention bias, reporting of results, clinical importance, drop outs, and conclusions. Total critical review scores were calculated to allow for comparison between studies. Any disagreements between reviewers were resolved via consensus between two authors. Final data extraction and quality appraisals were vetted by three authors and synthesized in evidence tables. There were an insufficient number of randomized controlled trials (RCTs) and too much variability in treatment types included in the review to permit a meta-analysis of studies.

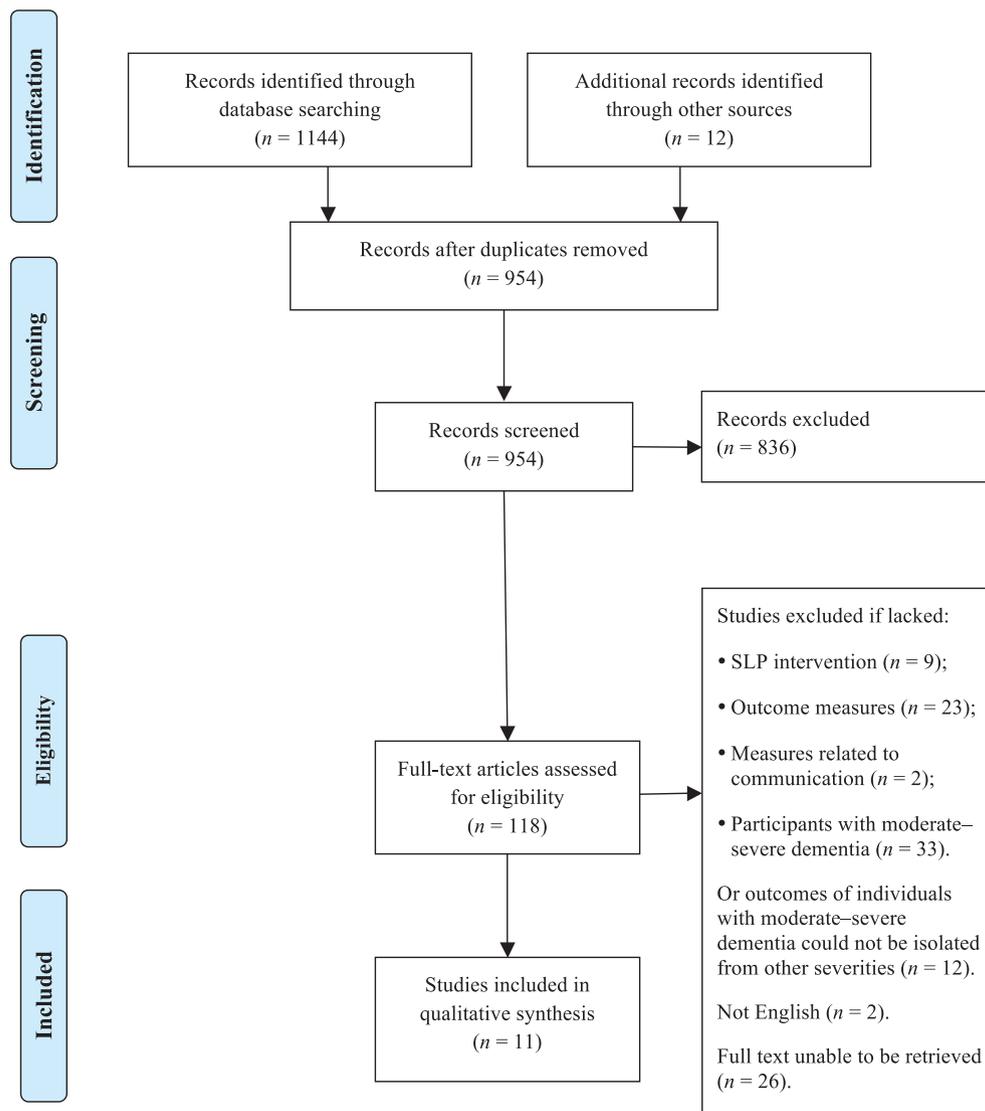
Results

Study Selection and Characteristics

The literature search yielded 1,144 citations, of which 202 were duplicates. Twelve additional citations were found from supplemental sources (found via hand searching of reference lists of included articles). Following abstract screening of all 954 studies, 836 were rejected in accordance with the inclusion/exclusion criteria, and 1,189 full-text articles were examined for inclusion. Following full-text screening, a total of 11 studies were included in the review. Reasons for exclusion following full-text screening are presented in Figure 1.

A summary of the included studies is presented in Table 1. The majority of studies were conducted in the United States (72%, $n = 8$), two were completed in Britain,

Figure 1. Systematic review flow diagram. SLP = speech-language pathologist.



and one in Japan. Included studies employed a range of designs, including RCTs ($n = 2$), non-RCTs ($n = 3$), single group pre-post studies ($n = 3$), case study ($n = 1$), and two substudies of larger RCTs: one, an in-depth analysis of outcome measure data (Spector, Orrell, & Woods, 2010) and, one, an investigation of the relative efficacy of various behavior management strategies implemented by caregivers (Bourgeois, Burgio, Schulz, Beach, & Palmer, 1997).

Study Quality

A summary of the methodological appraisal for the 11 included studies is presented in Table 2. Appraisal of methodological quality revealed that a mean total McMaster score was 10.3 out of 15 ($SD = 2.1$, range = 7–13), indicating overall average to above average quality. Two studies were rated as having a total McMaster score of 7 (Bourgeois, 1992;

Okumura, Tanimukai, & Asada, 2008). One study scored eight (Bourgeois et al., 1997), two studies scored 10 (Acton, Yauk, Hopkins, & Mayhew, 2007; Hopper, Bayles, & Tomoeda, 1998), two studies scored 11 (Frattali, 2004; Santo Pietro & Boczko, 1998; Tappen, Williams, Barry, & Disesa, 2002), and three studies scored 12 (Acton et al., 2007; Brush & Camp, 1998; Spector et al., 2010). The highest rating was 13, which was achieved by one study (Spector et al., 2003).

Participant Characteristics

A total of 352 participants were included across the 11 studies (see Table 1). More than half of the participants included were identified as “dementia type unspecified” (61%, $n = 214$), whereas the majority of the remaining participants were diagnosed with Alzheimer’s dementia or probable Alzheimer’s dementia (38%, $n = 136$).

Table 1. Study design and participant details.

Study	Design	Setting	Mean participant age (years)	No. of participants	Participant diagnoses	Diagnostic criteria/ mean MMSE
Spector et al., 2003	Randomized controlled trial	5 day centers and 18 residential homes in the Greater London area, UK	Treatment: 85.7 Control: 84.7 Both groups: 85.3	<i>N</i> = 201 Treatment: <i>n</i> = 115 Control: <i>n</i> = 86	Unspecified	DSM-IV criteria for dementia Treatment MMSE: 14.2
Spector et al., 2010	Randomized controlled trial	As per Spector et al., 2003				
Tappen et al., 2002	Randomized controlled trial	2 nursing homes in USA	Across groups: 87.0	Total: <i>N</i> = 55	AD	ADRD-NINCDS criteria for probable AD MMSE = 11.0
Bourgeois et al., 1997	Multiple baseline across subjects design with matched comparison group	Homes of the participants in Pittsburgh, PA, USA	Treatment: 76.3 Control: 75.8	<i>N</i> = 14 Treatment: <i>n</i> = 7 Control: <i>n</i> = 7	AD	ADRD-NINCDS criteria for probable AD MMSE treatment: 13.3 MMSE control: 13.0
Okumura et al., 2008	Nonrandomized controlled study	Hospitals, group homes, and day service centers in Japan	Reminiscence: 84.0 Conversation group: 84.0	<i>N</i> = 16 Treatment: <i>n</i> = 8 Control: <i>n</i> = 8	AD	Not stated MMSE: 15.0
Santo Pietro & Boczek, 1998	Nonrandomized controlled trial	Nursing homes in New York, NY, USA	Treatment: 84.6 Control: 86.2	<i>N</i> = 40 Treatment: <i>n</i> = 20 Control: <i>n</i> = 20	AD	Not stated MMSE treatment: 15.6 MMSE control: 13.8
Bourgeois, 1992	Multiple baseline; comparison without control	Participants' homes and adult day care centers in Pittsburgh, PA, USA	80.0	<i>N</i> = 9	7 AD, 1 multi-infarct, 1 dementia not otherwise specified	ADRD-NINCDS criteria for probable AD MMSE at baseline: 15.7
Acton et al., 2007	Single group pre–post	Nursing homes in southern USA	81.0	<i>N</i> = 10	Unspecified	Not stated MMSE: 15.2
Frattali, 2004	Single case design	USA, exact location not specified	66.0	<i>N</i> = 1	FTD-SV	“Medically diagnosed”; MRI and PET scans
Hopper et al., 1998	Single case design (multiple subjects)	Adult care facility in Tucson, AZ, USA	78.5	<i>N</i> = 4	AD	DRS-2 score of < 1 percentile (severe) ADRD-NINCDS criteria for probable AD MMSE: 9.6
Brush & Camp, 1998 ^a	Single case design (multiple subjects)	Menorah Park Centre for the Aging, Beachwood, OH, USA	94.0	<i>N</i> = 2	Dementia type not specified	Physician's diagnosis (criteria not stated) MMSE: 11.0 and 14.0

Note. MMSE = Mini-Mental State Examination; AD = Alzheimer's dementia; DSM-IV = *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*; ADRD-NINCDS = Alzheimer's Disease and Related Disorders Association and National Institute of Neurological and Communicative Disorders and Stroke; FTD = frontotemporal dementia; SV = semantic variant; MRI = magnetic resonance imaging; PET = positron emission tomography; DRS-2 = Dementia Rating Scale.

^aNote that these data are taken only from participants who were classified as having a moderate–severe dementia.

Table 2. Summary of methodological appraisal—McMaster Quality Scores.

NHMRC level of evidence	Study	Purpose stated clearly	Literature reviewed	Design appropriate	Detailed sample description	Sample size justified	Reliable outcome measures	Valid outcome measures	Intervention described in detail	Contamination avoided	Reported statistical significance	Reported statistical significance	Appropriate analyses methods	Appropriate analyses methods	Reported drop outs	Appropriate analyses methods	Total score
II	Spector et al., 2003	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	X	✓	13
	Spector et al., 2010	✓	✓	✓	X	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	12
	Tappen et al., 2002	✓	✓	✓	✓	X	X	X	✓	✓	✓	✓	✓	✓	✓	✓	11
III-2	Bourgeois et al., 1997	✓	✓	✓	X	X	X	X	✓	✓	✓	X	X	✓	X	✓	8
	Okumura et al., 2008	✓	✓	X	X	X	X	X	✓	X	X	✓	✓	✓	✓	X	7
	Santo Pietro & Boczeko, 1998	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	11
III-3	Bourgeois, 1992	✓	✓	✓	X	X	X	X	X	✓	✓	X	X	✓	X	✓	7
	Acton et al., 2007	✓	✓	✓	✓	X	X	X	✓	N/A	N/A	✓	✓	✓	✓	✓	12
IV	Frattali, 2004	✓	✓	✓	✓	✓	✓	✓	✓	N/A	N/A	✓	✓	X	N/A	✓	11
	Hopper et al., 1998	✓	✓	✓	✓	✓	✓	✓	✓	N/A	N/A	N/A	✓	X	N/A	✓	10
	Brush & Camp, 1998	✓	✓	✓	✓	✓	✓	✓	✓	N/A	X	N/A	✓	✓	✓	✓	12

Note. ✓ = yes; X = no; NHMRC = National Health and Medical Research Council; N/A = not applicable.

One participant had a diagnosis of semantic variant frontotemporal dementia (FTD), and one was diagnosed with multi-infarct dementia. Diagnostic criteria, where stated, were derived from multiple sources. Diagnoses were based on the American Psychiatric Association (1994) criteria for dementia (Spector et al., 2010, 2003) or the National Institute of Neurological and the Communicative Disorders and Stroke–Alzheimer’s Disease and Related Disorders Association criteria (Bourgeois, 1992; Bourgeois et al., 1997; McKhann et al., 1984; Tappen et al., 2002) or medical review supported by magnetic resonance imaging and positron emission tomography scans (Frattali, 2004). Four of the included studies did not specify the diagnostic criteria used (Acton et al., 2007; Brush & Camp, 1998; Okumura et al., 2008; Santo Pietro & Boczko, 1998). All 11 included studies reported dementia severity. Ten studies reported MMSE scores ranging from 9.75 to 15.7 (moderate to moderate–severe; Acton et al., 2007; Bourgeois, 1992; Bourgeois et al., 1997; Brush & Camp, 1998; Hopper et al., 1998; Okumura et al., 2008; Santo Pietro & Boczko, 1998; Spector et al., 2010, 2003; Tappen et al., 2002). The Dementia Rating Scale–Second Edition (Mattis, Jurica, & Leitten, 2001) was used to assess one participant with FTD (Frattali, 2004). This participant scored within the percentile rank of < 1%, which indicates a severe impairment. Gender was reported for most participants. The majority were women (71%, $n = 250$), with 17% of participants reported as male ($n = 71$). Eleven percent ($n = 40$) of the participants did not have their gender reported. The age range for participants was 66 to 96 years.

Outcome Measures

Outcome measures used to assess communication varied between included studies (see Table 3). Measures included scales that rated function in conversation, such as the Holden Communication Scale (Holden & Woods, 1982) and the Todai-shiki Observational Rating Scale (Matsuda, Kurokawa, Saito, Maruyama, & Miyamoto, 2001); identifying and counting the frequency of certain communicative acts in conversation (e.g., frequency of certain verbalizations, such as requesting to go out; Bourgeois, 1992; Bourgeois et al., 1997; Brush & Camp, 1998; Santo Pietro & Boczko, 1998); or evaluating language performance on formal communication assessment batteries (e.g., Arizona Battery of Communication Disorders in Dementia; Bayles & Tomoeda, 1991).

Five studies utilized formal language assessments (Frattali, 2004; Okumura et al., 2008; Spector et al., 2010, 2003; Tappen et al., 2002), five used quantitative measures of words/topics and certain specific communicative behaviors in communication samples (Acton et al., 2007; Bourgeois, 1992; Brush & Camp, 1998; Hopper et al., 1998) or tallied across the day (Bourgeois et al., 1997), and one used both formal language assessment and quantitative measures (Santo Pietro & Boczko, 1998). No studies used qualitative outcome measures. Three studies reported on QoL outcomes (Frattali, 2004; Okumura et al., 2008; Spector et al., 2003), and one reported anecdotal evidence of well-being changes (Santo Pietro & Boczko, 1998).

Intervention Characteristics

Intervention occurred in a range of settings, with some studies using multiple sites. Settings included the home (Bourgeois, 1992; Bourgeois et al., 1997; Spector et al., 2010, 2003), respite centers (Bourgeois, 1992; Okumura et al., 2008; Spector et al., 2010, 2003), nursing homes (Acton et al., 2007; Brush & Camp, 1998; Hopper et al., 1998; Okumura et al., 2008; Santo Pietro & Boczko, 1998; Tappen et al., 2002), inpatient hospital wards, and outpatient clinics (Frattali, 2004; Okumura et al., 2008). The dosage of therapy for direct treatments varied significantly and was not consistently reported. Of the studies reporting this information, total dosage ranged from 1 hr to 45 hr, (median = 12 hr), delivered across 1 to 16 weeks (median = 12 weeks).

In six of the studies, therapy was delivered by SLPs (Bourgeois, 1992; Bourgeois et al., 1997; Brush & Camp, 1998; Frattali, 2004; Hopper et al., 1998; Santo Pietro & Boczko, 1998). The researchers administered therapy in the remaining studies (Acton et al., 2007; Okumura et al., 2008; Spector et al., 2010, 2003; Tappen et al., 2002). In these studies, professions were not always reported. Most interventions appear to have been delivered by psychologists, except for Acton et al. (2007) where intervention was delivered by an advanced practice nurse who was a member of the research team.

Studies varied in terms of intervention types, delivery methods, and settings (see Table 4). Ten studies reported on results of direct interventions (Bourgeois, 1992; Bourgeois et al., 1997; Brush & Camp, 1998; Frattali, 2004; Hopper et al., 1998; Okumura et al., 2008; Santo Pietro & Boczko, 1998; Spector et al., 2010, 2003; Tappen et al., 2002). One study reported on an indirect intervention (Acton et al., 2007). The majority of direct intervention studies included cognitive stimulation approaches, which were administered in groups ($n = 5$) or individually ($n = 1$), with fewer studies of direct intervention using cognitive rehabilitation ($n = 2$) or cognitive training approaches ($n = 2$). Group-based cognitive stimulation approaches included conversation therapy (Santo Pietro & Boczko, 1998; Tappen et al., 2002), reminiscence therapy (Okumura et al., 2008), cognitive stimulation therapy (CST; Spector et al., 2010, 2003), and a socialization/activity of daily living group (Santo Pietro & Boczko, 1998), whereas Hopper et al. (1998) used an individual cognitive stimulation approach to treatment using toy-based stimuli to assist in eliciting conversation in a structured conversation task.

More specifically, Tappen et al. (2002) compared a conversation group with a walking group and a combination group (walking plus conversation). The conversation group and combination group involved natural conversation about personally relevant topics. Okumura et al. (2008) compared a group engaged in reminiscence therapy with a general conversation control group. The reminiscence therapy involved the use of four themed conversation topics, such as childhood play and helping with housework, intended to elicit discussion/conversation. Santo Pietro and Boczko

Table 3. Outcomes measures and main findings of studies.

Study	Outcome measures	Main findings	Maintenance effects
Spector et al., 2003	Communication: • Holden Communication Scale • The Alzheimer's Disease Assessment Scale Cognitive (ADAS-Cog) subscale QoL: • Cornell Scale for Depression in Dementia and the Anxiety in Dementia • Quality of Life-Alzheimer's Disease (QoL-AD)	CST resulted in significantly improved performance on the ADAS-Cog ($p = .014$), a measure of language and cognition, and QoL ($p = .028$) compared with the "usual care" group. Nil statistically significant difference between groups on the Holden Communication Scale.	N/A
Spector et al., 2010	Communication: • ADAS-Cog QoL: N/A	Authors further analyzed ADAS-Cog results from Spector et al., 2003. Significant difference between treatment and control groups in total ADAS-Cog score ($p = .01$) and Language subscale ($p = .001$), with CST group scoring higher. No other significant differences.	N/A
Tappen et al., 2002	Communication: • The Picture Description Test QoL: N/A	All groups resulted in a decreased number of words used compared with participants' baseline function. The Conversation group resulted in increased conciseness and verbal information expressed compared with the walking group. Active engagement in structured conversation may improve communication.	N/A
Bourgeois et al., 1997	Communication: • Frequency of "problem" repetitive verbalizations (e.g., where is my handbag) QoL: N/A	Repetitive verbalizations (e.g., accusations and repeated questions) decreased when caregivers prompted PWD to look at memory aids and cards. Statistical significance not calculated.	Caregivers continued strategies 6 months post active treatment. Frequency of repetitive verbalizations remained lower than at baseline.
Okumura et al., 2008	Communication: • 4-item verbal fluency test • Todai-shiki Observational Rating Scale • Saint Marianna Hospital's Elderly Dementia Patients' Daycare Evaluation Table for care giving staff (day care evaluation table) QoL: • 5-point subjective Mood and Happiness scales (created by authors for this study)	Reminiscence group recalled significantly more words ($p = .000$) in the verbal fluency test compared with their baseline performance. Reminiscence group also had significantly ($p = .002$) increased incidences of nonverbal communication compared with conversation therapy group. Patients in the reminiscence group had higher "happiness" scores postintervention than the control ($p = .012$).	N/A
Santo Pietro & Boczko, 1998	Communication: • ABCD • COMFI • Incidents of "cross conversation" between group members (any utterance from one patient to another patient) QoL: N/A	Breakfast club participants significantly improved in functional independence on COMFI scale ($p \leq .01$) and interactions with other group members ($p \leq .025$) compared with baseline. There was a statistically significant difference between breakfast club and conversation group in language as measured by the ABCD ($p \leq .025$), with results favoring the breakfast club. There was anecdotal evidence of participants reporting enjoying the breakfast club, with family members commenting on participants being more "themselves" and nursing staff commenting on improved compliance.	N/A

(table continues)

Table 3. (Continued).

Study	Outcome measures	Main findings	Maintenance effects
Bourgeois, 1992	Communication: <ul style="list-style-type: none"> • Number of on-topic statements and elaborated answers • Frequency of nonproductive/ambiguous statements QoL: N/A	PWD using memory wallets with minimal training made similar gains to PWD trained to use memory wallets by caregivers. Gains included a decrease in frequency of ambiguous and nonproductive statements and an increase in production of novel sentences. Statistical significance not calculated. One participant's wife reported increased cooperation with scheduled daily activities as result of using the memory wallet, and nurses of a trained and untrained participant noted that both could be redirected easily to use the wallets to engage in conversations with other residents.	3 of the 9 participants demonstrated some maintenance of treatment effects without any additional training.
Acton et al., 2007	Communication: <ul style="list-style-type: none"> • Quantitative analysis of number of words used by PWD, words per topic, and number of topics required to sustain conversation QoL: N/A	Compared with an untrained communication partner, a skilled communicator used individualized communication strategies during an interview, which resulted in a statistically significant increase in mean words per topic, but did not increase total mean number of words used. Total number of topics needed to sustain a 15-min interview decreased ($p \leq .05$) with the trained partner. Gains were most dramatic among PWD with lowest MMSEs (2 and 5). The participant with MMSE of 2 was totally nonverbal in the first interview (nonskilled communication partner) and used 197 words in the with skilled partner + communication strategies.	N/A
Frattali, 2004	Communication: <ul style="list-style-type: none"> • Western Aphasia Battery--Aphasia Quotient • Boston Naming Test • Communication Activities of Daily Living • Peabody Picture Vocabulary Test QoL: N/A	Positive results found for errorless learning paired with effortful learning, with transitory improvement in confrontation naming ability for trained verbs and nouns. No generalization to untrained stimuli.	No maintenance of gains in language or QoL measures at 3 or 18 months' follow-up.
Hopper et al., 1998	QoL: <ul style="list-style-type: none"> • American Speech-Language-Hearing Association Quality of Communication Life scale Communication: <ul style="list-style-type: none"> • Number of information units • Number of words • Conversation initiation QoL: N/A	More information units were produced when the toy stimulus was present; however, the total number of words was not influenced by the toy stimulus, nor did the presence of the toy stimulus increase the participants' initiation of conversation. The realism of the stimuli did not affect the number of information units or words.	N/A
Brush & Camp, 1998 ^a	Communication: Ability to recall and retain: <ul style="list-style-type: none"> • Therapist's name • Personally relevant, meaningful piece of information (e.g., room number) • A compensatory strategy or technique (e.g., use of a schedule) QoL: N/A	The two participants with moderate-severe dementia both improved in their recall of the tested information. One participant could correctly recall the meaningful information and the compensatory technique and inconsistently recall the therapist name. The other participant inconsistently recalled the therapist name and meaningful information; however, the compensatory technique was not included as the participant did not complete the study.	No long-term follow-up. Posttesting for one participant for one target was only 2 weeks, not 4.

Note. CST = cognitive stimulation therapy; N/A = not applicable in study (i.e., no QoL measures used); PWD = person with dementia; ABCD = Battery of Communication Disorders in Dementia; COMFI = Communication Outcome Measure of Functional Independence (Santo Pietro & Boczeko, 1997); MMSE = Mini-Mental State Examination.

^aFindings are reported for the two participants with moderate-severe dementia only.

Table 4. Description of treatment and dosage.

Study	Type of treatment	Treatment(s)	Length of sessions (min)	Sessions/ week	Weeks	Total no. of sessions	Total dose (hr)
Spector et al., 2003	<ul style="list-style-type: none"> • Direct treatment • Cognitive stimulation • Group therapy, approximately 5 members 	Intervention group: cognitive stimulation therapy Control group: usual care (day care center program, e.g., arts and bingo)	45 min, 2 × week for 7 weeks	2	7	14	10.50
Spector et al., 2010	As per Spector et al., 2003	As per Spector et al., 2003	As per Spector et al., 2003				
Tappen et al., 2002	<ul style="list-style-type: none"> • Direct treatment • Cognitive stimulation • Conversation therapy and combination of walking and conversation therapy • Group therapy 	1) Conversation therapy group: set strategies provided in natural conversations 2) Walking therapy group: self-paced or assisted walking without conversation 3) Combination therapy group: combined walking and conversation simultaneously	30 min, 3 × week for 16 weeks	3	16	48	24.00
Bourgeois et al., 1997	<ul style="list-style-type: none"> • Direct treatment • Cognitive rehabilitation • Alternative and augmentative communication/memory aid ± caregiver training • Caregiver training 	PWD prompted by caregiver to look at cue cards when repetitive verbalizations occur	60 min at PWD's home for 12 weeks +180-min carer workshop	1	12	11	14.00
Okumura et al., 2008	<ul style="list-style-type: none"> • Direct treatment • Cognitive stimulation • Reminiscence therapy or conversation therapy • Group therapy 	Reminiscence therapy group with four themes Conversation therapy group. No set themes. Discussed a range of everyday topics.	60	1	5	5	5.00
Santo Pietro & Boczko, 1998	<ul style="list-style-type: none"> • Direct treatment • Cognitive stimulation • Breakfast club and conversation therapy • Group therapy, 5 participants 	"Breakfast club": Conversation facilitated relevant to tasks of preparing and eating breakfast, plus predetermined topics postmeal Control group: conversational therapy	45	5	12	60	45.00

(table continues)

Table 4. (Continued).

Study	Type of treatment	Treatment(s)	Length of sessions (min)	Sessions/ week	Weeks	Total no. of sessions	Total dose (hr)
Bourgeois, 1992	Direct treatment • Cognitive rehabilitation • Alternative and augmentative communication/memory aid ± caregiver training • Caregiver training	1) Caregivers trained to provide daily training for participants to use memory aids when answering questions	Group 1) Caregivers: 2 × 30-min training sessions				1.00
		2) PWD given memory aids with minimal training	PWD: daily training, provided by carers—length of sessions not specified				Unclear
			Group 2) Unclear if caregivers provided with training, no formal training for PWD				Unclear
Frattali, 2004	Direct treatment • Cognitive training • Naming therapy • Individual, face-to-face with patient	Phase A: noun training, generalization to untrained verbs Phase B: verb training—generalization to untrained nouns, maintenance of performance for trained nouns	120	1	12	12	12.00
Acton et al., 2007	Indirect treatment • Cognitive rehabilitation • Altering communication partner's communication style • Caregiver training	Communication partner compensating for PWD's weaknesses using individualized communication strategies	One 15-min interview, communication partner utilizing individualized communication strategies				0.25
Hopper et al., 1998	Direct treatment • Cognitive stimulation • Use of toy stimuli in conversation	Conversation: related questions from the investigator to the participant in the presence of a toy stimulus	2 intervention sessions, duration not specified			2	Unknown
Brush & Camp, 1998	Direct treatment • Cognitive training • Spaced retrieval training	Spaced retrieval training used to treat learning tasks, including learning a name, a personally relevant piece of information, and a compensatory strategy, such as use of a daily schedule	30–60 min	3	Approximately 3	20–21	Approximately 10–21

Note. PWD = person with dementia.

(1998) evaluated the effects of a multimodality treatment called the *breakfast club*, whereby people with dementia were engaged in relevant conversation during breakfast mealtime activities, in comparison to a regular conversation group. Communication relevant to the activities was elicited throughout, and predetermined topics of conversation were introduced postmeal for further discussion.

Spector et al. (2003) and Spector et al. (2010) integrated theoretical principles of reality orientation and cognitive stimulation to implement CST in groups. Conversations (including current affairs topics and reminiscence) only constituted part of the approach. Participants also engaged in reality orientation activities, noncognitive tasks, multisensory stimulation activities, and linguistic tasks, such as word association and object categorization.

Two studies investigating direct interventions used cognitive training approaches (Brush & Camp, 1998; Frattali, 2004). Frattali (2004) applied principles of errorless and effortful learning to naming therapy for an individual with severe, progressive dysnomia in the setting of FTD. Therapeutic discourse focused on semantic feature analysis to elicit correct retrieval of target nouns (in the first phase) and verbs (in the second phase). Brush and Camp (1998) used spaced retrieval training to teach three learning tasks: learning a therapist's name, learning one piece of personally relevant information, and learning a compensatory technique.

Two remaining studies used a cognitive rehabilitation approach to train caregivers in the use of augmentative and alternative communication (AAC; i.e., memory wallets or cue cards) to facilitate improved conversation with the PWD (Bourgeois, 1992; Bourgeois et al., 1997). Bourgeois et al. (1997) developed a therapy approach designed to equip caregivers of people with Alzheimer's disease with a behavior management procedure to address repetitive verbalizations by the PWD. Caregivers were trained to use AAC in the form of external memory aids, specifically, cue cards containing written information. In an earlier, similar experiment, Bourgeois (1992) implemented caregiver training with the use of memory wallets to support conversation between PWD and familiar partners. The content included in the wallet was individualized and aimed at prompting recall of personally relevant, factual information, such as names, places, and events.

The only study in the review, which investigated an indirect intervention, took the form of communication partner training (Acton et al., 2007). Acton et al. (2007) drew upon principles of social communication theory and examined conversations facilitated by untrained communication partners compared with skilled communication partners using individualized communication strategy prescriptions.

Effects of Treatment

Although heterogeneous in design and implementation, all of the included studies in this review reported improvements in the participant's conversation or discourse abilities.

Direct Treatment

Overall, the included studies suggest positive evidence for direct treatment of communication in moderate-severe dementia but with different patterns of results for different approaches. Details of results for each study are presented in Table 3. Language impairment was seen to improve through cognitive stimulation group interventions, including CST (Spector et al., 2010, 2003), reminiscence group (Okumura et al., 2008), and breakfast club (Santo Pietro & Boczeko, 1998), as well as through the cognitive training approach of individual naming therapy (Frattali, 2004), as measured by assessment of communication skills or the language/communication subtests of cognitive assessments. Measures of conversation participation, such as number of words used, incidence of nonverbal communication acts, increased conciseness, or increase in production of novel sentences, improved through group interventions, such as the conversation group (Tappen et al., 2002) and reminiscence group (Okumura et al., 2008), as well as in the presence of the toy stimuli (Hopper et al., 1998). Although not consistent, some improved ability to recall meaningful personal information and therapist's name were found in two participants following spaced retrieval training (Brush & Camp, 1998). Similarly, interventions prompting the use of cue cards (Bourgeois et al., 1997) and memory wallets (Bourgeois, 1992) showed positive outcomes, with measures recording a decrease of responsive verbal behaviors (including numbers of repetitive verbalizations or use of ambiguous or nonproductive statements).

Maintenance

Long-term follow-up post therapy was reported in only three studies (Bourgeois, 1992; Bourgeois et al., 1997; Frattali, 2004). Gains were not maintained following naming therapy, but both studies utilizing AAC and caregiver training reported some maintenance effects on reduction in frequency of repetitive verbalizations (Bourgeois et al., 1997). For two participants in the study using memory wallets (Bourgeois, 1992), followed up at 30 and 24 months, respectively, there was a reduction in the frequency of ambiguous and nonproductive statements approximating results achieved in training and maintenance phases (see Table 3).

Indirect Treatment

The study by Acton et al. (2007) found that communication partner training was successful in increasing PWD's engagement in conversation. Specifically, Acton et al. (2007) reported no mean increase in overall number of words used by PWD; however, researchers did see an increase in the mean words per topic and a reduction in the number of topics required to sustain a 15-min conversation under the skilled partner, prescribed strategies condition.

Discussion

This review aimed to examine the current evidence base for communication interventions for people with

moderate–severe dementia. Ten studies investigating direct interventions were included, along with one study that examined the outcomes of an indirect intervention. Overall, the review found a modest level of evidence in support of direct communication interventions for people with moderate–severe dementia to improve communicative function and participation and associated QoL, compared with baseline or control groups. No two studies used the same approach or examined the same outcome, resulting in a lack of strong evidence for any one approach. However, the use of a cognitive stimulation within a group setting was the most commonly used intervention approach. Employing conversation as a therapy medium was also a recurring theme across the interventions examined in the current review.

Robey and Schultz (1998) proposed a five-phase model for defining and distinguishing the phases of clinical outcomes research and may be useful in describing the current evidence base for any given area of investigation. According to this model (Robey & Schultz, 1998), the majority of the research included in the review was considered Phase 1 or 2 research. These early phases of research test whether the treatment has a therapeutic effect, seeking to define the target population and optimal dosage, and generally involve small groups without control participants (Robey & Schultz, 1998). Eight of the included papers could be considered to be Phase 1 or 2 studies, and therefore, their findings may be seen as providing the opportunity for detailed investigation and valuable building blocks for subsequent, higher level phase studies in these areas.

Only two studies (one of which generated two papers; Spector et al., 2010, 2003; Tappen et al., 2002) appeared to be Phase 3 research, employing a randomized controlled study design with larger participant numbers to evaluate the efficacy of the intervention. Spector et al. (2010, 2003) found the multimodal stimulation program of CST resulted in improvements, which were specific to language only, demonstrating the potential impact of this program on communication function. A moderate level of evidence was found to support the benefits of therapeutic conversation groups (Tappen et al., 2002), also considered to be Phase 3 research. Despite two Phase 3 research studies, the predominance of earlier phases of research suggests that there is a diversity of potential treatment options for moderate–severe dementia requiring additional research to further establish its efficacy (i.e., Phase 4 and 5).

Despite the overall heterogeneity of the included studies, some commonalities were identified. Firstly, all 11 studies (examining both direct and indirect interventions) focused on conversation or discourse as the modality of treatment. In most studies, the treatment was presented in a group context that facilitated conversation (e.g., cognitive stimulation treatment, reminiscence group, conversation group, and breakfast club). In others, conversation was used to conduct interventions that were delivered individually, such as training caregivers in AAC or individualized communication strategies, or conducting naming therapy to support conversation with the PWD. Given the variability of the included

studies, it is not possible to conclude which type of conversation practice is most effective; however, it appears that appropriately supported conversation may be an important element to consider for treatments that aim to improve communication for people with moderate–severe dementia.

Another common theme among studies reporting positive outcomes was the use of group treatment. Indeed, CST (Spector et al., 2010, 2003), conversation therapy (Tappen et al., 2002), reminiscence therapy (Okumura et al., 2008), and a treatment that combines social interaction with procedural tasks (i.e., “breakfast club”; Santo Pietro & Boczko, 1998) were all delivered in a group format. One potential benefit of group treatment is the inherent opportunities it provides participants with to communicate in more natural interactions. Group treatment has also been suggested to be particularly cost effective, as reported in other communication disorders, such as aphasia (Elman, 2007). The findings of the current review therefore suggest that group treatment for communication impairments in moderate–severe dementia may be of potential benefit to communication function.

Group treatment and discourse are also core components of the cognitive stimulation approach to therapy, which engages PWD in a range of activities and discussions to enhance cognitive and social functioning (Aguirre et al., 2013). A recent systematic review of cognitive stimulation interventions in dementia similarly found improvements in communication using group-based approaches in PWD; however, this review generally included participants with mild–moderate dementia (Woods et al., 2012). The present findings therefore highlight the potential benefit of cognitive stimulation approaches in individuals with moderate–severe dementia. Although less prevalent, certain studies also used cognitive training (Brush & Camp, 1998; Frattali, 2004) or cognitive rehabilitation approaches with people with moderate–severe dementia (Acton et al., 2007; Bourgeois, 1992; Bourgeois et al., 1997). The current review revealed that there is preliminary evidence that using AAC as part of a cognitive rehabilitative approach may be a potential intervention option for people with moderate–severe dementia. PWD demonstrated the ability to use AAC to improve conversation with minimal training (Bourgeois, 1992; Bourgeois et al., 1997), with one study showing that this may reduce repetitive, nonproductive (i.e., inappropriate or irrelevant) verbalizations (Bourgeois et al., 1997). While there were promising findings in participants who received cognitive training approaches, including spaced retrieval training (Brush & Camp, 1998) and naming therapy (Frattali, 2004), findings in the present review were based on results of three participants; therefore, results included may not be generalizable to the wider population.

Despite the range of differing intervention methods utilized across the studies, all reported some positive outcomes. This commonality may potentially be underpinned by some of the principles of experience-dependent neural plasticity, including the principles of “use it or lose it,” saliency, and specificity of treatments. Specifically, *experience-dependent neural plasticity* refers to the ability of neurons to

alter their structure in response to internal and/or external stimuli, such as behavioral interventions (Kleim & Jones, 2008). There is growing evidence suggesting application of these principles in neurodegenerative conditions, including dementia (Boggio et al., 2011; Fox, Ebersbach, Ramig, & Sapir, 2012; Fox et al., 2006; Herholz, Herholz, & Herholz, 2013; Jokel et al., 2011).

The idea of neuroprotection via the application of the “use it and improve it” principle was supported by Frattali (2004), who hypothesized that this principle may have explained findings of improved naming during active therapy, which was lost when therapy was ceased. Although the combination therapies (walking + plus conversation) in Tappen et al.’s study (2002) may have been expected to make gains under the “use it and improve it” principle, the dual tasking may have placed an overload on participants’ cognitive capacity.

Saliency may also be a key factor in treatment effectiveness. Indeed, Tappen et al. (2002)’s conversation therapy involved personally relevant topics, which may have increased the salience of the task. Okumura et al. (2008) found that reminiscence therapy involved discussion of topics that were familiar to participants and, hence, featured language about personal opinions and recollections, with subsequent higher saliency than their facilitator-led control conversation group. Santo Pietro and Boczko (1998)’s breakfast club may have also incorporated the neuroplasticity principles of “saliency” and “specificity” through the use of language relevant to the task at hand (i.e., talking about making breakfast, social language in a social context) and the inclusion of conversation about personal memories. As the language was specific to the context, Santo Pietro and Boczko may have avoided the negative impact of cognitive load as found in Tappen et al. (2002)’s combination therapy.

An interesting finding was that many of the studies ($n = 5$) were likely conducted by professions other than SLPs. This raises a question for the outcomes of communication treatment by SLPs in moderate–severe dementia. If conversation-based therapies undertaken with other professions with an understanding of language and communication (e.g., psychologists) are successful, might there be potential for these treatments to be equally if not even more successful if undertaken by SLPs who specialize in communication treatment? Indeed, all studies included in this review article were considered appropriate to be administered by SLPs by the authors.

Limitations and Directions for Further Research

Although this review aimed to synthesize evidence for both direct and indirect treatments, only one study of indirect treatment met our inclusion criteria. A number of studies of indirect interventions commonly used by SLPs in dementia, such as communication partner training (Egan, Bérubé, Racine, Leonard, & Rochon, 2010; Eggenberger et al., 2013; Smith et al., 2011), had to be excluded as they did not specify dementia severity. It would therefore be useful for researchers to include in future research a clear

description of participants’ severity of dementia using a standardized measure and provide differentiation of results where possible so that clinicians can more readily translate findings to people with moderate–severe dementia, particularly for indirect interventions.

Surprisingly, the review revealed a paucity of recent literature examining communication intervention in moderate–severe dementia, with no studies meeting the review criteria that were published after 2010. While 40 articles published since 2010 were identified in the full-text screening stage, the majority of these articles were either conducted with people with mild–moderate primary progressive aphasia, investigated other interventions of mild–moderate dementia, or were review articles. This may reflect that, currently, the rehabilitative literature in dementia continues to focus on impairment level or “cognitive training” types of treatment approaches, with research being conducted in earlier stages of dementia in order to establish an evidence base for these treatments. The promising evidence synthesized in the present review, particularly for cognitive stimulation and cognitive rehabilitation techniques, however, warrants further research into these approaches for individuals with moderate–severe dementia.

In addition to the lack of recent studies, there are other gaps in the current literature examining communication intervention in moderate–severe dementia. Namely, only three studies reported QoL outcome measures (Frattali 2004; Okumura et al., 2008; Spector et al., 2003). While improvement on language or cognition test scores is important, if this does not translate to improvement in communicative participation or well-being for the PWD and/or their caregiver/s, the benefit may be questionable. Further research should therefore seek to include such measures. Researchers should also ensure that outcome measures they are using are sensitive to changes in treatment. For example, use of diagnostic assessment batteries, such as the Arizona Battery for Communication in Dementia (Bayles & Tomoeda, 1991), as an outcome measure for activity or participation-orientated treatments may be problematic.

Secondly, the majority of studies were single group design or controlled case studies. These studies provide valuable information and are essential to establishing treatment efficacy (Robey & Schultz, 1998); however, these reflect that the evidence base in the area is within the relatively early phases of development. Although some of these single case studies may have been well designed, it should be acknowledged that, due to the nature of the McMaster appraisal tool scoring system, they may have been given lower scores than poorer quality group-based studies.

Lastly, due to the significant impact dementia and associated communication impairments may have on other functional outcomes, including caregiver burden and ongoing care and services, it is also suggested that future research investigates the impact of intervention on both communication function together with measures including overall functional status (e.g., the impact of behavioral and

psychological symptoms of dementia—behavioral and psychological symptoms of dementia on function). A long-term follow-up period would also be useful in future investigations. Consideration of these aforementioned areas in further research will help continue to build the clinically applicable evidence base for communication interventions in moderate–severe dementia.

Clinical Implications

There is evidence that direct communication interventions for people with moderate–severe dementia may improve or protect communication function and potentially improve QoL. This review provides preliminary evidence that clinicians working with people with more advanced dementia can make meaningful changes to communication, and this should be recognized by health service managers when planning services for dementia whether in the hospital, community, or residential facilities.

Specifically, cognitive stimulation approaches to group models and conversation should be considered when providing treatment to this population, with consideration given to principles of experience-dependent neural plasticity when planning treatment—saliency, specificity, and “use it or lose it.” Due to the language-specific benefits, SLP services may also consider using formalized cognitive stimulation therapies within their settings and seek appropriate training protocols to undertake this. While caregiver training and certain types of AAC (i.e., cue cards and wallets), as well as certain cognitive training approaches (e.g., spaced retrieval and naming therapy), may also have some potential benefit for this population, more rigorous research is needed to determine their effectiveness for people with moderate–severe dementia.

Conclusion

The review provides preliminary evidence for a variety of direct communication interventions that could be delivered by an SLP in the treatment of a person with moderate–severe dementia. Due to high variability in the evidence, the most appropriate type and dosage of intervention remain unclear. However, group-based cognitive stimulation approaches using conversation show promise. Further, well-designed research is needed to guide management of communication difficulties for this population.

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