Supporting people with dementia to eat


Abstract

The aim of this systematic review was to identify the best ways of supporting people with dementia to eat. Five electronic databases were searched, with a date range from January 2004 to July 2015. Following screening of the 233 studies identified, 22 were included in the final analysis. The study interventions focused on educational programmes, environmental or routine changes, and assistance with eating, with the strongest evidence shown in the more complex educational programmes for people with dementia. The evidence suggests that staff who support people with dementia to eat should undertake face-to-face education programmes and aim to give people enough time when helping them to eat. However, cultural change may be needed to ensure individual assessments are carried out to identify those having difficulty eating, and to ensure they are afforded enough time to eat their meals.

Keywords
dementia, hydration, nutrition, older people, systematic review

MOST PEOPLE LIVING with dementia manage well with eating and drinking for many years, however, others experience significant difficulties. The effects of eating difficulties on people with dementia are well documented and include unintentional weight loss (Aselage et al 2011), malnutrition, decline in physical function, poor quality of life and reduced ability to prevent illness, for example, infection and pressure ulcers. These adverse effects can result in the person being placed in a care home (Lin et al 2010a). In one study, 60% of caregivers reported problems with eating (Aselage et al 2011).

Aim

The aim of this systematic review was to identify the best ways of supporting people with dementia to eat.

Method

The review was carried out using guidance from the Centre for Reviews and Dissemination (2008) and is reported in line with the PRISMA statement (Preferred Reporting Items for Systematic reviews and Meta-Analyses) (Moher et al 2010).

Search strategy

Five electronic databases were searched: PubMed, MEDLINE, Cumulative Index to Nursing and Allied Health Literature, PsycINFO, and British Nursing Index. Search dates were from January 2004 to July 2015 and reference lists from included articles were also searched. The search terms were: dementia, Alzheimer’s, feeding, eating, mealtime(s), oral intake, nutrition, environment, culture, family caregiver, informal carer, intervention, experiment and quasi-experiment. All articles included in the review were written in English.

To ensure all relevant studies were included, the Population, Intervention, Comparison, Outcomes, Timing and Setting framework (Guyatt et al 2008) was used to address the search question and establish inclusion and exclusion criteria.

Quality appraisal

Studies were selected by two reviewers based on inclusion criteria, following three steps:

» Screening by title and abstract.
» Assessing full text eligibility for inclusion.
» Reviewing full text for quantitative content.

Where eligibility for inclusion in the review was unclear from the study abstract, the full text was retrieved and read fully before a decision was made.

Neither reviewer was blinded to the authors of the studies, the institutions or
publications. Each reviewer assessed the studies independently and disagreements were discussed and resolved.

The quality of the individual studies was assessed independently by the same two reviewers using a checklist based on guidelines from the Quality Assessment Tool for Quantitative Studies (National Collaborating Centre for Methods and Tools 2008).

Where there were two or more studies using the same intervention, the final strength of the evidence presented by the combined studies was evaluated using the Grading of Recommendations, Assessment, Development and Evaluations Working Group criteria (BMJ Clinical Evidence 2012).

**Results**

The literature search revealed 227 articles and a further six were identified from the reference lists of articles found, giving a total of 233. In total, 26 duplicates were removed, leaving 207 articles to be screened by reading the title and abstract. After screening, 28 articles were selected for a full-text read, and a further six were excluded. This left 22 articles for the final quantitative analysis (Figure 1).

**Study characteristics and quality**

The characteristics and quality of each of the 22 articles are set out in Tables 1-4.

Studies were grouped according to the type of intervention used: educational, environmental or routine changes, assistance with eating, and mixed interventions. They were reviewed individually for quality of evidence.

**Educational**

Ten educational studies were identified, with a total of 1,283 people with dementia enrolled. The numbers for each study ranged from 946 (Salvà et al 2011) to just three (Beattie et al 2004) (Table 1).

The programmes varied from three hours of classroom teaching (Chang and Lin 2005) to one week of classroom teaching and three months of clinical practice supervision (Mamhidir et al 2007). All involved face-to-face sessions, except Batchelor-Murphy et al (2015), which was a feasibility study of a web-based programme.

Three studies (Chang and Lin 2005, Suominen et al 2007, Batchelor-Murphy et al 2015) provided details of the number of staff involved in the programme, drop-out rates and demographics, while two showed their sample size and power calculations (Chang and Lin 2005, Suominen et al 2007).

All except Salvà et al (2011) reported some positive outcomes, such as increases in the time people with dementia spent sitting (Chang and Lin 2005) and increased food/calorie consumption (Suominen et al 2007, Batchelor-Murphy et al 2015). Encouragingly, there was a positive response from caregivers in terms of reported improvement in knowledge among professional carers (Chang and Lin 2005) and attitudes towards people with dementia (Batchelor-Murphy et al 2015).

Studies aimed at training people with dementia (Beattie et al 2004, Lin et al 2010b, 2011, Wu et al 2014a, 2014b) and people with dementia and their family carers (Salvà et al 2011) were of strong to moderate quality, except one (Beattie et al 2004). In these studies participant demographics and drop-out rates were discussed as appropriate, however, inclusion criteria and selection of participants could have been reported more clearly.

**Environmental or routine changes**

Studies that reported on interventions to the mealtime environment or to the pre-mealtime routine of the person with dementia mostly took place in long-term care facilities; one took place in a rehabilitation unit (Richeson and Neil 2004) (Table 2). A total of 445 people...
TABLE 1: Educational interventions

<table>
<thead>
<tr>
<th>Author, year, location</th>
<th>Study design</th>
<th>Sample and setting</th>
<th>Intervention</th>
<th>Comparator</th>
<th>Duration</th>
<th>Outcomes</th>
<th>Study quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beattie et al 2004, US</td>
<td>CCT</td>
<td>People with dementia – 1 male and 2 female – in 2 long-term dementia specialist units</td>
<td>Systematic reinforcement of sitting-at-table behaviour</td>
<td>Self-control</td>
<td>6 weeks</td>
<td>Sitting at table longer, Increased food consumption, Stable body weight</td>
<td>Weak</td>
</tr>
<tr>
<td>Chang and Lin 2005, Taiwan</td>
<td>CCT</td>
<td>67 nursing assistants in 2 long-term dementia specialist units for &gt;6 months (I=31 all-female, C=36, 94% female)</td>
<td>Eating skills training programme which included 3 hours of classroom teaching and 1 hour of hands-on training</td>
<td>Not available</td>
<td>8 weeks</td>
<td>Intervention group increased knowledge, Positive attitude and behaviour, People with dementia – increased sitting time, Increased eating difficulties, No increase in food intake</td>
<td>Moderate</td>
</tr>
<tr>
<td>Chappell et al 2007, Taiwan</td>
<td>CCT</td>
<td>Staff from a long-term dementia specialist unit People with dementia (I=18, C=15)</td>
<td>Staff education – 1 week classroom based and 3 months intensive support programme in clinical practice</td>
<td>Control group</td>
<td>3 months</td>
<td>Increase in weight correlated to increase in intellectual function, Relationships between weight gain, increased motor function and increased appetite non-significant</td>
<td>Weak</td>
</tr>
<tr>
<td>Suominen et al 2007, Finland</td>
<td>Cohort</td>
<td>23 nurses and 5 food service personnel in 5 nursing homes 21 people with dementia in 1 ward</td>
<td>Nutritional education programme for staff including six 2-3 hour teaching sessions with lectures, group discussions, homework and personal feedback</td>
<td>Self-control</td>
<td>6 months</td>
<td>Increase in energy intake, No increase in body mass index (BMI), No increase in mini nutrition assessment (MNA) score</td>
<td>Moderate</td>
</tr>
<tr>
<td>Lin et al 2011b, Taiwan</td>
<td>RCT</td>
<td>85 people with dementia from 3 long-term dementia specialist units</td>
<td>Spaced retrieval (SR) Montessori-based activities (MBA) 35-40 minute sessions three times per week</td>
<td>Routine activity</td>
<td>8 weeks</td>
<td>Reduced eating difficulty scores in SR and MBA groups, Increased need for physical and verbal assistance in MBA group, Improved MNA in SR group, Reduced MNA in MBA group, No increase in BMI</td>
<td>Strong</td>
</tr>
<tr>
<td>Lin et al 2011, Taiwan</td>
<td>RCT</td>
<td>29 people with dementia in 2 long-term dementia specialist units</td>
<td>MBA sessions for 30 minutes 3 days per week, with a 2-week washout period before crossover</td>
<td>Routine activity</td>
<td>8 weeks</td>
<td>Reduction in eating difficulties in MBA group, Self-feeding time and self-feeding frequency higher in control group, No increase in BMI</td>
<td>Strong</td>
</tr>
<tr>
<td>Salva et al 2011, Spain</td>
<td>RCT</td>
<td>946 ambulant people with mild/moderate Alzheimer's disease living at home with a family caregiver selected from medical centres (I=448, C=498)</td>
<td>Personalised information about Alzheimer’s and nutrition Caregivers received 4 teaching sessions about nutrition (NutiAlz)</td>
<td>Routine care</td>
<td>12 months</td>
<td>No effect on functional decline, No effect on BMI, MNA and activities of daily living</td>
<td>Strong</td>
</tr>
<tr>
<td>Wu et al 2014a, Taiwan</td>
<td>RCT</td>
<td>People with dementia in one of 4 long-term dementia specialist units (I=32, C=29)</td>
<td>SR and errorless learning 24 training sessions of 35-40 minutes spaced over 8 weeks</td>
<td>SR-only training</td>
<td>8 weeks</td>
<td>Increase in food intake, No difference in cognitive status</td>
<td>Strong</td>
</tr>
<tr>
<td>Wu et al 2014b, Taiwan</td>
<td>RCT</td>
<td>People with dementia in long-term care, 3 groups: Group 1 C=27 Group 2 I=25 Group 3 I=38</td>
<td>Group 2 SR and MBA Group 3 individualised SR and MBA</td>
<td>Routine activities</td>
<td>8 weeks</td>
<td>Reduced eating difficulties in groups 2 and 3, Increased eating amount in groups 2 and 3, Increase in weight in groups 2 and 3</td>
<td>Strong</td>
</tr>
<tr>
<td>Batchelor-Murphy et al 2015, US</td>
<td>CCT</td>
<td>Nursing home staff (I=17, C=18) who worked 7am-3pm People with dementia 5 in I and C groups</td>
<td>Web-based training module providing evidence-based information on mealtime difficulties</td>
<td>Standard training</td>
<td>8 weeks</td>
<td>Increased staff knowledge, Increased self-efficacy, No improvement in eating skills, Increase in eating assistance and food consumed, Increase in eating difficulties in both groups</td>
<td>Weak</td>
</tr>
</tbody>
</table>

CCT=controlled clinical trial; RCT=randomised controlled trial; I=intervention; C=control
with dementia were enrolled in these studies, with participant numbers ranging from 12 (Thomas and Smith 2009) to 120 (Rodríguez-Mansilla et al 2013). Three studies investigated the effects of music on food/calorie intake – one used live music before the lunchtime meal, engaging participants in a singalong session (McHugh et al 2012), while the other two involved recorded music being played during mealtimes (Richeson and Neil 2004, Thomas and Smith 2009).

McHugh et al's (2012) study involving participants taking an active part in the music sessions was subject to large amounts of missing data and, like a number of the studies about environmental or routine changes, the sample size was small (n=15). Only those studies that involved playing music during mealtimes demonstrated a positive effect on food intake.

One study was identified for each of the following interventions: use of contrasting colour tableware (Dunne et al 2004); exercise programme (Rolland et al 2007); homelike mealtimes (Desai et al 2007); acupuncture and massage (Rodríguez-Mansilla et al 2013); and placing an aquarium in the dining area (Edwards and Beck 2013).

The exercise programme was a strong quality study (Rolland et al 2007), however, there was no improvement in the amount of food eaten. The other studies were of moderate or weak strength due to small numbers, non-validated outcome measures (Rodríguez-Mansilla et al 2013), poor reporting of

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**TABLE 2: Environmental or routine changes**

<table>
<thead>
<tr>
<th>Author, year, location</th>
<th>Study design</th>
<th>Sample and setting</th>
<th>Intervention</th>
<th>Comparator</th>
<th>Duration (length/total)</th>
<th>Outcomes</th>
<th>Study quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dunne et al 2004, US</td>
<td>Interrupted time series</td>
<td>9 males with dementia in a long-term unit Different 9 males from same unit in follow-up study one year later</td>
<td>» Initial intervention: high-contrast red tableware High-contrast blue tableware » Low-contrast red tableware » Low-contrast blue tableware</td>
<td>White tableware</td>
<td>30 days (10 days per condition/ 30 days)</td>
<td>» Increase in food and fluid intake » Decline post-intervention » Increase in food and fluid intake using high-contrast blue » No increase using low-contrast red or blue</td>
<td>Moderate</td>
</tr>
<tr>
<td>Richeson and Neil 2004, Canada</td>
<td>Interrupted time series</td>
<td>27 people with dementia in specialist dementia and rehabilitation unit</td>
<td>Therapeutic music played during mealtimes</td>
<td>No music</td>
<td>2 weeks/ 4 weeks</td>
<td>» Increase in food intake » Reduction in agitation and aggression</td>
<td>Weak</td>
</tr>
<tr>
<td>Rolland et al 2002, France</td>
<td>RCT</td>
<td>134 people with dementia from 5 nursing homes (I=62, C=67)</td>
<td>1 hour collective exercise programme twice a week, comprising walk, strength, balance and flexibility training</td>
<td>Routine medical care</td>
<td>12 months</td>
<td>» Reduction in functional decline » Increase in 6-metre walking speed » No difference in weight or mini nutrition assessment scores</td>
<td>Strong</td>
</tr>
<tr>
<td>Desai et al 2007, Canada</td>
<td>CCT</td>
<td>49 people with dementia in nursing home (I=26, C=23)</td>
<td>Food delivery as bulk in a more homelike environment</td>
<td>Tray delivery in traditional institutional environment</td>
<td>9-12 months</td>
<td>» Increase in energy intake » No increase in fat intake</td>
<td>Moderate</td>
</tr>
<tr>
<td>Thomas and Smith 2009, US</td>
<td>Interrupted time series Crossover</td>
<td>12 people with dementia in nursing home</td>
<td>Background music played during mealtimes</td>
<td>No music</td>
<td>4 weeks/ 8 weeks</td>
<td>» Increase of 20% in calorie intake » Average weekly calorie intake increased each week</td>
<td>Moderate</td>
</tr>
<tr>
<td>McHugh et al 2012, US</td>
<td>CCT</td>
<td>15 people with dementia in long-term care facility (I=8, C=7)</td>
<td>Vocal re-creative music therapy singing pre-composed music with live music accompaniment under direction 4 days a week for 30 minutes before lunch</td>
<td>Self-control</td>
<td>No data</td>
<td>» No significant difference in nutritional intake</td>
<td>Weak</td>
</tr>
<tr>
<td>Rodríguez-Mansilla et al 2013, Spain</td>
<td>RCT</td>
<td>120 people with dementia living in residential home Massage group=40 Ear acupuncture=40</td>
<td>Massage by physiotherapist to back and lower limbs Monday to Friday for 20 minutes or ear acupuncture</td>
<td>No therapy</td>
<td>5 months</td>
<td>» Improvements in behaviour, sleeping, eating and participation in activities of daily living</td>
<td>Weak</td>
</tr>
<tr>
<td>Edwards and Beck 2013, US</td>
<td>CCT</td>
<td>70 people with dementia in long-term care facilities</td>
<td>Aquarium in dining area</td>
<td>Self-control</td>
<td>10 weeks</td>
<td>» Increase in daily food consumption</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

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participant demographics (Desai et al 2007) and lack of randomisation.

** Assistance with eating**

Simmons and Schnelle (2004) and Simmons et al (2008) each conducted a study on assistance with eating for people with dementia by research staff in long-term care units (Table 3). Both studies showed positive outcomes in terms of increased calories and amount of food consumed. In the 2008 study, the research staff spent an average of 42 minutes per mealtime with each patient, compared with 13 minutes spent by care unit staff. Both studies were randomised, reported demographics and drop-out rates, and validated and discussed the outcome measures. However, there was no sample size or power calculation.

**Mixed interventions**

In a moderate quality study, Wong et al (2008) used an interrupted time series design to investigate the effects on calorie intake and weight gain of observation, encouragement of dietary ‘grazing’, volunteers and the use of soothing music in the dining room, each of which was used for one phase of the study. Body mass index fell in the observation phase, but increased in the three intervention phases, as did calorie intake.

In a strong quality study, Charras and Frémontier (2010) conducted an experiment of shared mealtimes between residents and staff, with positive outcomes. However, the practice of staff taking their meals with residents was not received well by all staff and would be difficult to introduce on a full-time basis (Table 4).

**Discussion**

Generally the quality of the evidence for interventions involving environmental or routine changes was of moderate strength, mostly limited by a lack of randomisation or control, small sample size, lack of blinding during data collection and the possibility of bias. Watson and Green (2006) point out that research in this area is challenging, because of the difficulties faced by investigators when deciding which outcome measures are best suited to answering specific questions, but also because of difficulties in ensuring that participants are blinded to the intervention. It seems likely that simply spending more time with participants, either people with dementia or staff, regardless of the intervention, would have a confounding effect on the outcome, making the aim of delivering a rigorous piece of research in this area rather demanding.

The strongest evidence was from investigations of the effect of spaced retrieval, errorless learning and Montessori-based activities (Lin et al 2010b, 2011, Wu et al 2014a, 2014b). All three interventions are based on the understanding that procedural memory is relatively well maintained in people

<table>
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<th>TABLE 3: Assistance with eating</th>
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<tbody>
<tr>
<td><strong>Author, year, location</strong></td>
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<tr>
<td>Simmons and Schnelle 2004, US</td>
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<tr>
<td>Simmons et al 2008, US</td>
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</table>
with dementia, compared with semantic memory (general knowledge). In simple terms the instructor breaks down the task into small steps and demonstrates one step at a time, explaining in simple language what they would like the person to do and providing verbal prompts and visual clues. The person is not put in a position to make a mistake, as they would then remember and repeat the mistake.

These interventions have a biomedical theory base, focusing on the areas of the brain that are the least damaged by dementia. There is also a strong element of maintenance of personhood. The learning that takes place focuses on unmet needs – the need to be independent, to have self-esteem, to achieve positive outcomes – while taking into account the individual’s strengths and difficulties, and avoiding a focus on things they can no longer do or cannot relearn.

These interventions may fit well in clinical practice as the combination of medical knowledge and person-centred care aligns with nursing. Further research will need to be conducted in different settings with larger numbers of participants before these interventions can be recommended, since they require a high level of resources and commitment in terms of time and training. What does seem clear and relevant to current practice is that people with dementia benefit when staff have received face-to-face training supplemented by clinical supervision (Mamhidir et al 2007), and when people are given sufficient time to finish their meals (Simmons and Schnelle 2004, Simmons et al 2008). However, both interventions require more staff time than may be available in some institutions. Simmons et al (2008) also demonstrated that snacks between meals resulted in weight gain, with the advantage of being less resource intensive, at 13 minutes per snack. This may appeal to people with dementia, staff and managers.

A limitation of the studies reviewed here results from the interventions being applied to people with dementia who have had no assessment of their specific needs and difficulties. Without assessment, an intervention becomes a one-size-fits-all approach and is unlikely to meet needs fully and compensate for individual difficulties.

The relationship between dementia and eating difficulties is complex, derived from the biological and psychosocial consequences of the syndrome. According to Kitwood (1993), if we truly want to understand how people are reacting to their experience of dementia – for example, why they are not eating – we need to understand their personality and biography, as well as their physical health problems. Only then can we begin to understand the person and address their difficulties with specific interventions.

Limitations
The main limitation was the diversity of the interventions and outcome measures used in the studies, which made interpretation difficult. The difficulties with interpretation arose because the educational studies focused the intervention on different populations, while the environmental changes were varied too, ranging from pre-meal music to back massage.

### TABLE 4: Mixed interventions

<table>
<thead>
<tr>
<th>Author, year, location</th>
<th>Study design</th>
<th>Sample and setting</th>
<th>Intervention</th>
<th>Comparator</th>
<th>Duration (length/total)</th>
<th>Outcomes</th>
<th>Study quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wong et al 2008, New Zealand</td>
<td>Interrupted time series</td>
<td>98 people with dementia in short stay unit enrolled in one of 4 phased intervention arms: P1=23, P2=40, P3=7, P4=28</td>
<td>P1 observation P2 encourage dietary ‘grazing’ P3 volunteers to help with eating P4 soothing music played in dining room during mealtimes</td>
<td>Self-control</td>
<td>36 weeks</td>
<td>» P1 body mass index (BMI) fell » P2-4 increase in BMI and calorie intake » No increase in mid-arm circumference or mini nutrition assessment score</td>
<td>Moderate</td>
</tr>
<tr>
<td>Charras and Frémonier 2010, France</td>
<td>CCT</td>
<td>Staff from 1 long-term dementia specialist unit 18 people with dementia (I=8, C=10)</td>
<td>Staff sharing mealtimes with residents developed from an idea during nutritional training programme which included supervised practice, environmental design and changes to table linen</td>
<td>Self-control</td>
<td>6 months</td>
<td>» Increase in weight in I group</td>
<td>Strong</td>
</tr>
</tbody>
</table>

CCT=controlled clinical trial; RCT=randomised controlled trial; I=intervention; C=control
Conclusion
People living with dementia experience a range of difficulties with eating, because of the different areas of the brain that can be affected, as well as the individual’s personality and life history. We can try to make changes to address these difficulties based on our understanding of damage to the brain and how the person sees and experiences the world.

The eating difficulties experienced by people with dementia are unique to each person; successful interventions will therefore need to be based on assessments of each individual’s difficulties and what would be practical in their care environment.

Implications for practice
- Face-to-face education programmes can benefit staff
- People who require assistance to eat should be given sufficient time to finish their meals
- Individual assessment of eating difficulties is crucial

References


Simmons S, Schneider J (2004) Individualized feeding assistance care for nursing home residents: staffing requirements to implement two interventions. The Journals of Gerontology. Series A, Biological Sciences and Medical Sciences. 59, 8, M966-M973.


