Evidence *in* Context

Issue: Agitation and Aggression in LTC Residents with Dementia
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Health research — synthesized and contextualized for use in Newfoundland & Labrador

2018 Evidence Update:

Managing Agitation and Aggression in Long-Term Care Residents with Dementia

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Celebrating the 10th Anniversary *of the* Contextualized Health Research Synthesis Program

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Evidence Update 2018

Managing Agitation and Aggression in Long-Term Care Residents with Dementia

Background

In 2014, the Contextualized Health Research Synthesis Program (CHRSP) published a contextualized health evidence synthesis report on interventions, strategies, and/or practices that have proven effective in preventing and managing agitation and aggression among LTC residents with dementia and that did not involve the use of physical restraints or psychotropic drugs. The Project Team was led by Dr. Neena Chappell, Canada Research Chair in Social Gerontology and Professor of Sociology at the University of Victoria. The original study is available on the CHRSP website.[1]

This synthesis update adds the findings of systematic reviews published since 2014. The CHRSP team did not have the resources to fully assess the original and updated evidence with our new evidence rating system. Instead, we attempted to align the more lenient evidence rating system that had been used for the original report with our current more comprehensive and conservative methodology. The evidence synthesis in this update is more conservative and rigorous than in the original, but not as conservative or rigorous as our more recent and ongoing CHRSP projects. A comparison between the evidence rating systems of the original report and of this update is available in the Appendix, which starts on Page 19.

The evidence rating system for this update assesses the strength of the combined body of evidence for a particular intervention to achieve a given outcome for a defined population. The strength of the body of evidence increases with the quality of the systematic review, the number of unique primary research studies included in the evidence synthesis, and the consistency of the findings. We use the AMSTAR instrument to appraise the quality of systematic reviews (range: 0, low—11, high)(1) and categories of methodological quality based on the original report: 0-3 = Low, 4-7 moderate, 8-11 high. Inconsistent findings are interpreted as a "Very Weak" body of evidence by default (see Table 1).

Body of Evidence	# of Systematic Reviews	# of Primary Studies
Strong	2+ High Quality	10+
Moderate	1+ High Quality	10+
Weak	1+ High Quality	5+
Very Weak	1 Moderate Inconsistent Findings	1-4

Table 1: Evidence thresholds for Strength of Body of Evidence categories if findings are consistent.

The evidence rating system also considers whether or not the evidence favours the intervention group (i.e., the intervention is works), or indicates no benefit compared to the control group (i.e., the

[1] http://www.nlcahr.mun.ca/CHRSP/DementiainLTC2014.php

intervention is not effective), or is unable to indicate if the intervention group achieved better outcomes than the control group (i.e., unable to draw a conclusion).

Research Question for this Synthesis

"Other than use of physical restraints or prescription of psychotropic medications, what interventions, strategies, and/or practices have proven effective in preventing and managing agitation and aggression in long term care residents with dementia?"

Results

We included 25 systematic reviews in this update. Eleven were high quality and 14 were of moderate quality. Nine reviews were appraised as low quality and excluded from the synthesis. The inter-rater reliability for appraising methodological quality was 0.81, which is considered high (2). See Table 2 for a summary of the critical appraisal results.

Methodological Quality	Reference	AMSTAR Score	Cochrane Review
High (12)	**Abraha, 2017** (3)	**11/11**	**Yes**
	Fleiner, 2017 (4)	9/11	No
	Forbes, 2014 (5)	**10/11**	**Yes**
	Forbes, 2015 (6)	**10/11**	**Yes**
	Forrester, 2014 (7)	**9/11**	**Yes**
	Fossey, 2014 (8)	8/11	No
	Karkou, 2017 (9)	**8/11**	**Yes**
	Matsunaga, 2016 (10)	9/11	No
	Travers, 2016 (11)	8/11	No
	Van der Steen, 2017 (12)	**11/11**	**Yes**
	Whear, 2014a (13)	8/11	No
Moderate (14)	Anderson, 2017 (14)	6/11	No
	Barreto, 2015 (15)	7/11	No
	Blackburn, 2017 (16)	4/11	No
	Brasure, 2016 (17)	6/11	No
	Chang, 2015 (18)	6/11	No
	Disalvo, 2016 (19)	7/11	No
	Jutkowitz, 2016 (20)	7/11	No
	Kim, 2016 (21)	7/11	No
	Konno, 2014 (22)	6/11	No
	Livingston, 2014a (23)	7/11	No
	McDermott, 2018 (24)	5/11	No
	Pan, 2014 (25)	6/11	No
	Soril, 2014 (26)	7/11	No
	Tsoi, 2017 (27)	6/11	No

Low (9)	de Oliveira, 2015 (28)	2/11	No
	Gomez-Romero, 2017 (29)	3/11	No
	Livingston, 2014b (30)	3/11	No
	Marquardt, 2014 (31)	3/11	No
	Millan-Calenti, 2016 (32)	2/11	No
	Preuss, 2016 (33)	2/11	No
	Staedtler, 2015 (34)	2/11	No
	Strøm, 2016 (35)	3/11	No
	Testad, 2014 (36)	2/11	No

Table 2: Eligible systematic review critical appraisal results.

Overview

A surprisingly large number of systematic reviews have been published between 2014 and 2018 that address non-pharmacological interventions to reduce aggression/agitation among LTC residents with dementia. This increase in the number of systematic reviews is indicative of the increased interest in the topic, as well as a diversification in the study of potential interventions.

However, this increase in research product since the original report was not matched by an increase in clarity. Systematic reviews frequently cited an insufficient quantity or quality of evidence from which to draw conclusions. Interventions with more than one systematic review often had findings that were not consistent or were contradictory. We observed that systematic reviews with better methodological quality and more rigorous standards tended to find smaller or no effect sizes compared to reviews with lower quality or less rigorous standards.

The limitations of systematic reviews to indicate effective and not effective interventions are directly related to the quality of the underlying primary research evidence. Systematic reviews in this update routinely cautioned that the included studies had significant limitations. These included: imprecision in measurement, using different measures across studies, issues in terminology describing interventions, a critical lack of detail in describing intervention components, significant concerns regarding the fidelity of implementation of the intervention, small sample sizes and risk of bias. As a result, while many interventions were studied, relatively few clear conclusions can be drawn from the evidence thus far.

The remainder of this report is divided into three sections. The first is an update to the original report, consisting of summaries of the evidence synthesis on interventions discussed in the original report, organized by intervention as they were in the original report. The second section consists of summaries of the evidence for 'new' interventions that were not included in the original report, presented alphabetically. The last section is an appendix that details our methodology and data extraction.

Findings: Interventions Studied in Original Report

The original project reported on 13 different interventions. These are updated below in the same order as they were in the original, from the strongest to the weakest body of evidence.

Music Therapy

We identified eight additional systematic reviews studying Music Therapy (MT) of moderate (16–18,22,23,27) or high methodological (11,12) quality. The updated evidence is not as consistent as it was in the original report. Three reviews demonstrated statistically significant decreases in agitation and/or aggression in LTC residents with dementia (18,23,27). However, a Cochrane Review and an extensive AHRQ Review found statistically insignificant benefits and concluded that the evidence indicates MT is not more effective than usual care (12,17). And one review concluded there was insufficient evidence to draw any conclusions (22).

This confusion appears to originate from the methodological limitations in the original primary studies, mainly poor experimental design and heterogeneity of the design and implementation of the interventions. Several reviews highlighted the low quality of the evidence, citing potential risk of bias, poor safeguards for intervention fidelity, small sample sizes and lack of follow-up (12,17,27). Further, MT as a single intervention category incorporates a range of different approaches and implementations. Differences in variables, such as the design of the MT intervention, and the frequency and the duration of intervention exposure, may be expected to produce different estimates of effect size.

In particular, Tsoi et al. point to evidence indicating that "receptive" MT may be more effective than "active" MT (27). Receptive MT consists of individuals listening to personalized music selections as an activity in itself or while engaging in unrelated activities, e.g., listening to music while eating. Individuals or groups engaged in active MT do not just listen but are also engaged in related music activities, e.g., playing instruments or singing in a group. The Cochrane review by Van der Steen (12) included two receptive MT studies that scored higher than two active MT studies, one for agitation and one for anxiety. This new finding is consistent with the finding of a high-quality review by Whear et al. (37) reported in our original report ; but Konno et al. (22) do not agree. An additional potential confounding variable to note is the implementation of MT with or without a protocol. Livingston et al. (23) found that MT delivered with specific protocols was effective for reducing emergent agitation and decreasing symptomatic agitation (but not "additional" agitation or agitation among residents with severe dementia). Neither of the recent reviews identified in this update that concluded that MT was not effective (12,17) carried out sub-group analyses for these different types of MT interventions.

The differing conclusions of the review literature make it difficult to assess the strength of the body of evidence, which is most accurately labelled as inconsistent and "Very Weak." The conclusion of the most recent, high-quality Cochrane Review is that MT is not more effective than usual care represents a significant caution (12). Despite these negative findings, the reader should note that there remains a substantive and varied review literature that endorses MT to reduce aggression/agitation among LTC residents with moderately severe dementia (16,18,23,27,37,38). No reviews have found MT to reduce aggression/agitation for residents with severe dementia.

As described above, the most likely explanation for the inconsistency is that the diversity of MT interventions and implementations, combined with the relatively low volume and substandard quality of research trials, has produced conflicting findings in the review literature. Given the relatively low cost and few barriers to implementation, decision makers may still want to consider trying versions of MT for

which the evidence is strongest, i.e., receptive MT based on an established protocol for residents with moderately severe dementia.

Staff Training

Evidence within the intervention category of "Staff Training" shares some of the same complexities and difficulties as it does for MT, namely wide variation in approaches and implementations. The original report included reviews that considered various staff training interventions grouped together. Those reviews found, overall, a positive effect for managing aggression/agitation among LTC residents with dementia through staff training initiatives.

This update identified seven systematic reviews that studied different types and aspects of staff training (8,11,17,20–23). The original project considered Staff Training generally and Person-Centered Bathing (PCB) as two separate categories. This update combines the two under an umbrella category of Staff Training, which is further sub-divided into four types: Dementia Care Mapping (DCM), Emotion-Centered Care (ECC), PCB and Person Centered Care (PCC).

Person Centered Care

The most rigorously studied sub-category of Staff Training was PCC, with six systematic reviews reporting on this approach (8,11,17,20,21,23). Two moderate quality reviews concluded that the evidence was insufficient to draw any conclusions (17,20). However, the remaining reviews were unequivocal that sufficient evidence is available to endorse PCC to reduce aggression/agitation for LTC residents with dementia (8,11,21,23).

The most extensive review by Kim and Park (21) included seven primary research studies that measured aggression/agitation outcomes. They conclude that the evidence "confirmed the beneficial effect of PCC on reducing agitation in dementia", and note that "the effects were mostly for a short term and lasted 6 weeks on average". Two other reviews concur with varying levels of certainty, ranging from "convincing evidence" (23) to "limited evidence" (11).

One systematic review considered training packages for staff and how their implementation affected measures of aggression/agitation (8). Four different products are included in a meta-analysis. The authors conclude that the evidence: "clearly shows that person-centred intervention and training packages have a significant positive impact on both agitation and on reducing the use of antipsychotic medications, strongly reinforcing the value of this approach" (8).

Despite the dissenting opinions, the balance of the evidence indicates that Staff Training in PCC is effective at reducing aggression/agitation among LTC residents with moderate dementia in the short term. This is consistent with the findings from the original report and increases the strength of the body of evidence to "moderate".

Person-Centered Bathing

This update found one systematic review that addressed PCB directly (22). It appears to be an update of a previous review that was included in the original report (39). The more recent review is in agreement with the previous, finding that a "person-centred care approach to bathing care" resulted in significant

decreases in "care resistance", which included measures of aggression/agitation. It should be noted that the four underlying primary studies did not study PCB in isolation of other person-centred care training measures, and so it is not possible to attribute the improvements solely to PCB. The strength of the body of evidence for PCB remains "Very Weak."

Dementia-Care Mapping

The original report included evidence for DCM within a broader discussion of Staff Training. This update found two moderate quality systematic reviews that studied DCM (17,20). They found that training staff in DCM did not produce any consistent or clinically significant improvements in reducing aggression/agitation. In both reviews, the evidence was drawn from a small number of low quality primary research studies. One concluded that there was evidence of no improvement (17), while the other found the evidence was insufficient to draw any conclusions (20). The strength of the body of evidence remains "Very Weak".

Emotion-Oriented Care

The original report did not include evidence for EOC. This update found one moderate quality systematic review that studied EOC and it found insufficient evidence to draw any conclusions (17).

Reducing the Use of Anti-Psychotic Medications

The original report referenced a Cochrane Review that found older people with dementia exhibiting neuropsychiatric symptoms "can be withdrawn [from anti-psychotic medications]without detrimental effects on behaviour" (40). However, the authors noted significant caveats including the potential for relapse and the probable benefits from continuing use of anti-psychotic medications. This update does not do much to resolve the lack of clarity on the issue. Four relevant systematic reviews were identified (17,19,20,25). Each studied different aspects of reducing anti-psychotic drug use.

Most relevant to the original report's findings, Pan et al. studied all related findings to evaluate the risks and benefits of antipsychotic drug discontinuation in dementia (25). This moderate quality systematic review included five studies that "investigated the effects of discontinuation of first-generation antipsychotics or risperidone." Their results indicated that average BPSD scores (which include aggression/agitation) increased but was not statistically significant (i.e., between group difference). However, the proportion of participants in the discontinuation group that worsened, compared to the continuation group, was statistically significant (i.e., within group difference). The same was found with the proportion of participants in the discontinuation group who left the study early. The authors note a lack of high quality studies from which to draw conclusions and highlight the need to closely monitor patients who discontinue anti-psychotic medications.

Jutkowitz et al. studied the efficacy of clinical practice guidelines to reduce anti-psychotic prescriptions and their impact on aggression/agitation. They found there was insufficient evidence to draw conclusions, though the one study they included indicated no average improvement and large variability (20).

Brasure et al. looked at staff training and clinical protocols to reduce the use of antipsychotic medications. They concluded there was insufficient evidence to draw any firm conclusions, but what

evidence was available indicated that such interventions were not effective at reducing aggression/agitation (17).

Disalvo et al. considered systems to identify inappropriate prescribing of any medications among persons with advanced dementia (19). They did not report on anti-psychotics specifically. There was insufficient evidence on any of the systems' effectiveness at reducing aggression/agitation.

The evidence in this update highlights the caveats of the original report. Discontinuation of anti-psychotic medications is not without difficulties and close monitoring is recommended. The synthesis findings indicate that the evidence for interventions to assist in reducing anti-psychotic prescriptions is inconclusive. The strength of the body of evidence for each of these areas of inquiry is "Very Weak."

Animal-Assisted Therapy

One new systematic review was identified that studied the effectiveness of animal assisted therapy (i.e., "pet therapy") to reduce aggression/agitation among LTC residents with dementia (23). The moderate quality review concluded that there "is too little evidence, of too low a standard, to make recommendations about the use of pet therapy for agitation." These findings are consistent with the original report. The strength of the body of evidence is "Very Weak".

Aromatherapy

Four new systematic reviews studied aromatherapy as an intervention to reduce aggression/agitation among LTC residents with dementia. A Cochrane Review concluded that the evidence was inconclusive because of low quality primary research studies, and no conclusions could be drawn (7). The three other reviews, all of moderate quality, concluded that the findings demonstrated no benefit to reducing aggression/agitation compared to usual care. These findings are consistent with the original report. The strength of the body of evidence is "Weak" that aromatherapy is not more effective than usual care.

Dance Therapy

This update identified a Cochrane Review studying the effectiveness of dance therapies to reduce aggression/agitation among LTC residents with dementia (9). None of the available studies met the inclusion criteria, as none were delivered by a "qualified dance movement therapy practitioner". Two trials were reportedly still ongoing, but no publications of their results were found in a search of Pubmed and Google Scholar. These findings do not add any new information to the original report. The strength of the body of evidence remains "Very Weak."

Pain Treatment

No new systematic reviews found. The strength of the body of evidence remains "Very Weak."

Personalized Activities

Three new moderate quality systematic reviews studied a category of intervention labeled Personalized or Individualized Activities (11,17,23). This category is heterogeneous and poorly defined. Two of the reviews included the same primary research studies as those referenced in the original report. Travers et al. synthesized two primary research studies that showed individualized recreational activities may

significantly improve aggression/agitation, but only when social interaction was included in the intervention (also consistent with the original report) (11). However, these studies had small sample sizes and significant risk of bias. The strength of the body of evidence remains "Very Weak."

Simulated Family Presence

One Cochrane review (3) and one review of moderate quality (17) synthesized the evidence for Simulated Family Presence to reduce aggression/agitation among LTC residents with dementia. Both agreed that there was little available evidence, what was available was of very low quality and that no conclusions could be drawn. The strength of the body of evidence is "Very Weak."

Special Care Units

This update identified one high quality systematic review that studied the impact of dementia special care units on aggression/agitation among LTC residents (26). It consisted of one study comprising 32 participants (16 in both intervention and control groups). The results indicate that residents in the specialized care units exhibited less agitation at twelve months after the beginning of the intervention. The quality of all the studies is described as low to moderate and the sample sizes as small. No details were provided on the features of the specialized care units.

While this new evidence is consistent with the findings from the original report, the strength of evidence is "Very Weak." This and the lack of detail concerning the features of the specialized care unit make it impossible to draw any firm conclusions.

Staff Case Conferences

No new systematic reviews found. The strength of the body of evidence remains "Very Weak."

Findings: Interventions Not Reviewed in the Original Report

Systematic review evidence for eleven additional interventions was identified in this evidence update. They are presented below in alphabetical order.

Electro Stimulation

One moderate quality systematic review studied Electro Stimulation as an intervention to reduce aggression/agitation among LTC residents with dementia (17). It found one trial with significant methodological issues. The authors concluded that there was insufficient primary research evidence to reach any conclusion. The strength of the body of evidence is "Very Weak."

Enhancing Family Visits

One moderate quality systematic review studied Enhancing Family Visits as an intervention to reduce aggression/agitation among LTC residents with dementia (17). It found one trial with significant methodological issues. The authors concluded that there was insufficient primary research evidence to reach any conclusion. The strength of the body of evidence is "Very Weak."

Exercise

This update identified two high quality systematic reviews (4,6) and three of moderate quality (15,17,23) that investigated exercise as an intervention to reduce aggression/agitation among LTC residents with dementia. One Cochrane Review and one other moderate-quality review concluded that exercise did not reduce aggression/agitation relative to control groups (6,15). Eight primary research studies in total were included. It should be noted that while no benefit was found with regard to aggression/agitation, both sets of authors found that exercise may confer other benefits to participants (e.g., reducing depression symptoms) and did not result in any adverse events.

The other high quality review (4) looked specifically at short-term exercise interventions (defined as up to three months in duration). Fleiner et al. concluded from five primary research studies that exercise improves behavioral and psychological symptoms of dementia (BPSD) generally, but without finding evidence for improved aggression/agitation specifically. The authors suggest that the mechanism is not that exercise reduces agitation *per se*, but rather that inactivity increases the likelihood of agitation. As a source of inactivity reduction, exercise may have the potential to decrease agitation among some types of participants.

The two moderate quality reviews concluded that significant limitations in the primary research precluded drawing any conclusions from the available evidence (17,23)

These findings suggest that exercise, in and of itself, is unlikely to reduce rates of aggression/agitation among LTC residents with dementia. Separately, the conflicting findings, in combination with the overall limitations in the evidence, indicate that the strength of the body of evidence is “Very Weak.”

Horticultural Therapy

One high quality systematic review investigated Horticultural Therapy as an intervention to reduce aggression/agitation among LTC residents with dementia (13). It characterized the quality of evidence as poor: “at risk of bias from the low number of RCTs, inconsistencies in study design and data analysis, lack of blinding (of outcomes), small sample sizes, unclear baseline details, and sometimes invalidated data collection tools, all of which limit the power and decrease the reliability and generalizability of the results.” (13) Nonetheless, the authors conclude that the included six quantitative studies and additional qualitative and mixed methods evidence indicate that outdoor gardening has “promise” to improve aggression/agitation. The strength of the body of evidence is “Weak.”

Humour Therapy

One moderate quality systematic review studied Humour Therapy as an intervention to reduce aggression/agitation among LTC residents with dementia (17). It found one trial with 398 participants but significant methodological issues. The authors concluded that there was insufficient primary research evidence to reach any conclusion. The strength of the body of evidence is “Very Weak.”

Massage / Therapeutic Touch / Acupuncture / Acupressure

Two moderate quality systematic reviews investigated a range of touch-related therapies to reduce aggression/agitation among LTC residents with dementia (17,23). These included massage therapy,

therapeutic touch, acupuncture and acupressure. In all cases, the primary research evidence came from a very limited number of poor quality studies. One review considered the evidence insufficient to draw conclusions (17). The other considered the evidence in aggregate and concluded that they provided "no significant improvements". The strength of the body of evidence is "Very Weak."

Multisensory Stimulation Room

One moderate quality systematic review studied Multisensory Stimulation Rooms as an intervention to reduce aggression/agitation among LTC residents with dementia (17). It found one small trial with significant methodological issues. The authors concluded that there was insufficient primary research evidence to reach any conclusion. The strength of the body of evidence is "Very Weak."

Pleasant Experiences

One moderate quality systematic review studied Pleasant Experiences as an intervention to reduce aggression/agitation among LTC residents with dementia (17). It found one trial with study limitations and imprecise estimates. The authors concluded that there was insufficient primary research evidence to reach any conclusion. The strength of the body of evidence is "Very Weak."

Reminiscence

One moderate quality systematic review studied Reminiscence as an intervention to reduce aggression/agitation among LTC residents with dementia (17). It found one trial with study limitations and imprecise estimates. The authors concluded that there was insufficient primary research evidence to reach any conclusion. The strength of the body of evidence is "Very Weak."

Structured Activities

One moderate quality systematic review included a comparator group consisting of interventions based on "Structured Activities". No details were provided to describe the intervention. In a summary of their findings, the authors found that there was insufficient evidence to assess its effectiveness to reduce aggression/agitation among LTC residents with dementia (17). The strength of the body of evidence is "Very Weak."

Yokukansan

One moderate quality systematic review studied a treatment intervention labeled 'yokukansan', which is a *kampo* or traditional Japanese herbal medicine (10). Drawing on five RCTs comprising 381 patients, it found statistically significant reductions in aggression/agitation. Further, it found that the effectiveness of yokusansan was better in groups of residents with mixed causes of dementia than in groups of persons with Alzheimer's disease only. The strength of the body of evidence is "Very Weak."

Conclusion

The original report attempted to find guidance for decision makers on interventions, strategies, and/or practices that have proven effective in preventing and managing agitation and aggression that did not involve the use of physical restraints or psychotropic drugs. This topic was and remains an important one for LTC settings in Canada. The original report found that systematic reviews studying the issue

were compromised by a lack of quality primary research evidence. This update indicates that the problem has in fact become worse, as a wide range of new interventions have come under the research spotlight, but the quality of the primary research has not improved sufficiently.

With regard to interventions that were studied in the original report and updated here, Staff Training in Person-Centred Care has the strongest body of evidence for effectiveness in reducing aggression/agitation in LTC residents with dementia. The evidence for Music Therapy remains contradictory, but a substantive body of research and expertise continue to endorse it. These are two classes of interventions that decision makers may want to consider adding to LTC facilities.

Intervention	Intervention Compared to Control	Body of Evidence
Interventions that are statistically more effective when compared to control		
Staff Training—Person Centered Care	Statistically More Effective	Moderate
Horticultural Therapy	Statistically More Effective	Weak
Pain Treatment	Statistically More Effective	Very Weak
Personalized Activities		
Staff Training—Person Centered Bathing		
Yokukansan		
Interventions that are NOT statistically more effective when compared to control		
Aromatherapy	Not Statistically More Effective	Weak
Massage / Therapeutic Touch / Acupuncture / Acupressure	Not Statistically More Effective	Very Weak
Staff Training—Dementia Care Mapping		
Interventions for which evidence for effectiveness in inconclusive		
Animal Assisted Therapy	Inconclusive	Very Weak
Dance Therapy		
Electro Stimulation		
Emotion-Oriented Care		
Enhancing Family Visits		
Humour Therapy		
Multisensory Stimulation Room		
Pleasant Experiences		
Reducing the Use of Anti-Psychotics		
Reminiscence		
Simulated Family Presence		
Special Care Units		
Staff Case Conferences		
Structured Activities		
Interventions for which evidence is inconsistent		
Exercise	Inconsistent Evidence	Very Weak
Music Therapy		

Table 3: Summary of Update Findings.

The remaining interventions examined in the original report still do not have sufficient evidence to draw any firm conclusions regarding effectiveness. Additional primary research evidence is needed to strengthen the body of evidence for Reducing the Use of Anti-Psychotics, Animal Assisted Therapy,

Aromatherapy, Dance Therapy, Pain Treatment, Personalized Activities, Simulated Family Presence, Special Care Units and Staff Conferences.

In the group of "new" interventions, this update only found "Very Weak" bodies of evidence for all intervention types. The evidence for Exercise as an intervention to reduce aggression/agitation in LTC residents with dementia had conflicting evidence that appears to lean toward its not being effective. The remainder of the interventions had only one or two systematic reviews covering less than ten primary research studies in each. As a result, the strength of the body of evidence was very low. However, intervention types that did appear promising, based on the high quality of the systematic reviews and conclusions of the review authors were Horticultural Therapy (13) and Yokukansan Therapy (10).

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Appendix:
A comparison between the evidence rating systems of the original 2014 report and of this 2018 update

Search Methodology

Search Strategy

Update search: Pubmed; 2014-2018 publication year, systematic reviews only (includes meta-analyses and health technology assessments).

(((intervention*[Title] OR therap*[Title]OR manag*[Title] or treat*[Title] OR strateg*[Title]) AND ("dementia"[Title] OR ((restraint*[Title] OR antipsychotic*[Title]) AND ("long-term care"[Title] OR "long term care"[Title] OR "long-term geriatric"[Title] OR "long term geriatric"[Title] OR "care home"[Title] OR "care homes"[Title] OR "nursing home"[Title] OR "nursing homes"[Title])))) OR (("Restraint, Physical"[Majr] OR "Antipsychotic Agents"[Majr]) AND ("Homes for the Aged"[Majr] OR "Nursing Homes"[Majr] OR "Long-Term Care"[Majr])) OR ("Dementia"[Majr] AND ("Therapeutics"[Majr] OR "Psychotherapy"[Majr])) OR ("Dementia/diet therapy"[Majr] OR "Dementia/nursing"[Majr] OR "Dementia/psychology"[Majr] OR "Dementia/rehabilitation"[Majr] OR "Dementia/therapy"[Majr])) AND (systematic[sb] AND 2014:2018[dp])

Eligibility Criteria

- **Only Systematic Reviews**
  - **No integrative, realist or other reviews for now**
  - **BUT: please note overviews**
- Population: Old people with dementia
  - 2/3 or separate analyses
- Intervention: Everything other than specific drugs
  - But, does include the modification or review of drug regimens
- Comparator: Usual care
- Outcome: Agitation and aggression
  - Look for: behavioural and psychological symptoms of dementia (BPSD), psychological problems, behavioural problems, executive function, frontal lobe function
  - Doesn't cut it: cognitive function, ADL/IADL, quality of life, anything to do with caregivers, anything to do with "satisfaction"
- Setting: Long term care
  - 2/3 or separate analyses

Search Results

- February 14, 2018: 705 hits
- Screened as potential (title abstract review): 103 articles
- Filtered as eligible (full text review): 35 articles

Evidence Categories from Original Report

Based on original study with additional criteria. SR = Systematic Review. PR = Primary Research studies/trials.

Original Report		This Update		
Category	**Description**	**Effectiveness**	**Body of Evidence**	**Criteria**
n/a	**Not in original report**	Effective	**Moderate**	1+ High Quality SR 10+ PR
Promising	Evidence for the intervention is supported by one or more high-quality reviews encompassing more than 5 different relevant primary studies	Effective	**Weak**	1+ High Quality SR 5+ PR
Suggestive	There is partial or qualified evidence to support the intervention, derived from one or more moderate-to-high quality reviews encompassing more than 1 relevant primary study	Effective	**Very Weak**	1+ Moderate or High Quality SR 1-4 PR
Insufficient	No moderate-to-high quality review evidence to support the intervention	n/a	n/a	0 Moderate or High Quality SR
	The combined reviews include less than or only one relevant primary study	Effective	**Very Weak**	1+ Moderate or High Quality SR 1 PR
n/a	**Not in original**: evidence that intervention group is not better than control group	Not Effective	Moderate	1+ High Quality SR 10+ PR
			Weak	1+ High Quality SR 5+ PR
			Very Weak	1+ Moderate or High Quality SR 1-4 PR
n/a	**Not in original**: inconsistent findings	Undetermined	Very Weak	

Evidence Category	Interventions in this category
PROMISING- *decision makers can be reasonably confident in the effectiveness of these interventions:*	• Music • Staff training • Reducing inappropriate use of anti-psychotics
SUGGESTIVE- *these interventions may be worth trying in LTC, though administrators would be well-advised to carefully evaluate their effects on the observed incidence of agitation and aggression:*	• Animal-Assisted Intervention • Aromatherapy • Dance Therapy • Pain Treatment • Personalized Activities • Person-Centred Bathing • Simulated Family Presence
INSUFFICIENT AT PRESENT- *decision makers are cautioned against expecting that these interventions will, by themselves, yield significant reductions in agitation or aggression:*	• Light Therapy • Special Care Units • Staff Case Conferences

Data Extraction

- Alphabetically ordered by intervention label
- Summary options, if evidence is available:
    - Demonstrated to be effective (meta-analysis, quantitative)
    - Interpreted as being effective (narrative analysis, qualitative)
    - Demonstrated or interpreted that evidence shows no effectiveness
    - Determined that there was insufficient primary research evidence to reach conclusion

Animal Assisted

Summary

- Determined that there was insufficient primary research evidence to reach conclusion: Livingston, 2014a

Livingston, 2014a (23)

- AMSTAR: 63.64
- Intervention type: Sensory, psychological and behavioural interventions (activities, music therapy, sensory interventions, training caregivers, light therapy, home-like care, training carers, exercise, changing environment, dementia-specific therapies, pet therapy.
- Settings: care homes/hospitals, community and domestic interventions.

- Main Findings: Pet Therapy: "Insufficient evidence"; "Overall, there is too little evidence, of too low a standard, to make recommendations about the use of pet therapy for agitation."

Aromatherapy

Summary

- Demonstrated or interpreted that evidence shows no effectiveness: Anderson, 2017; Brasure, 2016; Forrester, 2014 (Cochrane); Livingston, 2014a;

Anderson, 2017 (14)

- AMSTAR: 54.55
- Setting: All LTC
- Main Findings:
    - Quantitative
    - No difference
    - "In contrast with previous studies, often with less rigorous designs, findings demonstrated no improvement with aromatherapy in any of the studies. However, there is a trend where touch, interaction, and the presence of another human being improved BPSD, that other studies reflect as well."

Brasure, 2016 (17)

- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: "Low strength, no improvement"
    - "Aromatherapy intervention s involve inhalation or topical application of scented essential oils, such as lavender. Efficacy trials often used placebo aromas or sprays , such as sunflower oil. We identified six trials with acceptable risk of bias that assessed the efficacy of aromatherapy in nursing home residents with aggression/agitation. 35 - 40 The trials enrolled a total of 215 nursing home residents and were conducted in nursing homes in Australia, Japan, Hong Kong, and the United Kingdom. Four trials studied lavender 36 - 39 and two studied Melissa oil. 35 , 40 Treatments ranged in frequency and method of delivery. Aromatherapy was delivered via drops on clothing, diffused in the air, or applied as lotion. Frequency of aromatherapy ranged from two to three times a day for durations of 3 to 6 weeks."
    - Only in one trial (n = 72) did aromatherapy improve aggression/agitation compared with placebo . 35 This trial used a different scent (Melissa) than most other trials (lavender). The Melissa scent as lotion was also applied to the patient by a staff member, whereas the other trials delivered aromatherapy without touch, except for one trial arm that combined hand massage with aromatherapy. Low - strength evidence shows that aromatherapy with lavender is similar to placebo in managing aggression/agitation in dementia. Evidence regarding the effectiveness of Melissa in managing aggression/agitation in dementia is insufficient to draw conclusions. Evidence f or all other outcomes and harms was insufficient."

Forrester, 2014 (7)

- Setting: LTC or inpatient settings.

- Main findings: Qualitative, inconclusive
    - Five trials measured agitation on three scales. Participants were less agitated in the aromatherapy group in two studies, Ballard 2002 and Lin 2007; the latter was a cross-over study only reporting overall data. Three other studies (Burns 2011; Cameron 2011; Fu 2013) found no difference in participants' levels of agitation, although Cameron 2011 did not report any actual data and Fu 2013 did not report data separately for each treatment group. The results from two studies that measured behavioural symptoms were highly heterogeneous, with Ballard 2002 showing an effect in favour of aromatherapy and Burns 2011 finding no treatment effect. O'Connor 2013 also found no difference in observed behaviour between aromatherapy and placebo. Two studies (Burns 2011; Fu 2013) showed no difference in adverse effects, and a single study (Burns 2011) showed no difference in quality of life and activities of daily living of participants treated with aromatherapy compared to those treated with placebo.
- Notes: Cochrane

Livingston, 2014a (23)

- AMSTAR: 63.64
- Intervention type: Sensory, psychological and behavioural interventions (activities, music therapy, sensory interventions, training caregivers, light therapy, home-like care, training carers, exercise, changing environment, dementia-specific therapies, pet therapy.
- Settings: care homes/hospitals, community and domestic interventions.
- Main Findings: Aromatherapy: "No evidence of efficacy";
    - "All six aromatherapy studies took place in care homes. One excellent, large, blinded study found no immediate or long-term improvement for participants with severe agitation.97 This result is similar to a small, less rigorous blinded study.102 The results of the non-blinded studies were mixed.98–101"

Dance Therapy

Summary

- Determined that there was insufficient primary research evidence to reach conclusion: Karkou, 2017

Karkou, 2017 (9)

- AMSTAR: 72.73
- Settings: any settings were permitted to be included.
- Main findings: No studies were included in this **Cochrane review**.
    - "None of the studies reviewed met the inclusion criteria. Three studies (Hokkanen 2008, Hwang 2010 and Hamill 2011) were considered for inclusion. Closer inspection of these three studies, however, highlighted a failure to meet our criteria with regards to the intervention. Two ongoing studies were identified, a small trial undertaken in the UK by Lyons 2015 and a larger study taking place in Hong Kong by Ho Rainbow 2015. Both of these two studies are expected to be completed within a couple of years after this review was completed."

Electro Stimulation

Summary

- Determined that there was insufficient primary research evidence to reach conclusion: Brasure, 2016

Brasure, 2016

- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: Electro Stimulation: Insufficient
    - "One trial with study limitations and imprecise estimates provides insufficient evidence regarding the effectiveness of this intervention."

Enhancing Family Visits

Summary

- Determined that there was insufficient primary research evidence to reach conclusion: Brasure, 2016

Brasure, 2016

- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: Enhancing Family Visits: Insufficient
    - "One trial with study limitations and imprecise estimates provided insufficient evidence regarding the effectiveness of this intervention"

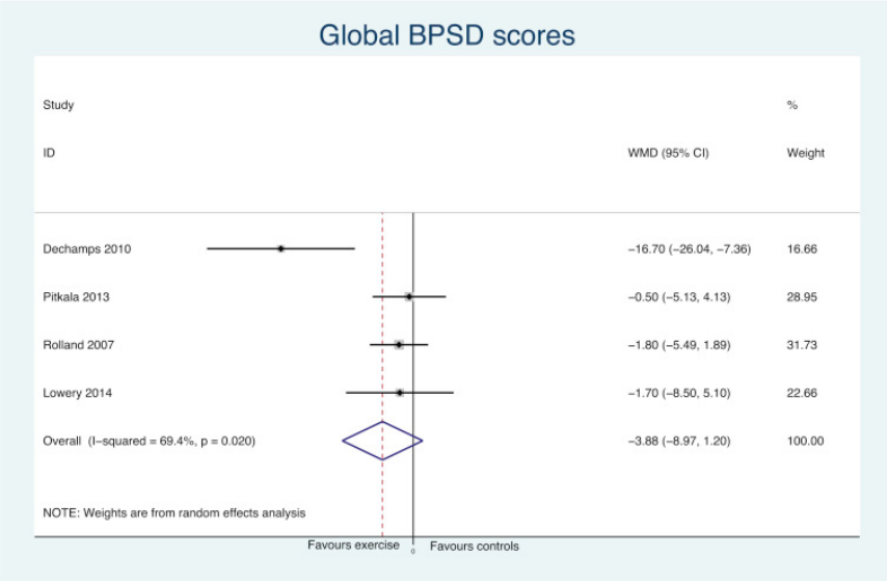
Exercise

Summary

- Interpreted as being effective (narrative analysis, qualitative): Fleiner, 2017,
- Demonstrated or interpreted that evidence shows no effectiveness: Barreto,2015; Forbes, 2015;
- Determined that there was insufficient primary research evidence to reach conclusion: Brasure, 2016; Livingston, 2014a;

Barreto,2015

- AMSTAR: 63.64
- Setting: institutionalized settings analyzed separately
- Main Findings:
    - Quantitative
    - No difference
    - "Exercise did not reduce global levels of BPSD (n = 4. Weighted mean difference −3.884; 95% CI −8.969–1.201; I2 = 69.4%)."



Download full-size image

Fig. 2. Main analysis of the effects of exercise on global BPSD scores in people with dementia.

-

Brasure, 2016 (17)

- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: Exercise: Insufficient
    - "Two trials with study limitations and imprecise estimates provided insufficient evidence regarding the effectiveness of this intervention."

Fleiner, 2017 (4)

- Intervention type: structured short term exercise programs.
- Setting: Special dementia care units (hospital and nursing home)
- Main findings:
    - "Within the process of reviewing, we only found five trials meeting the inclusion criteria. This indicates that only few short-term exercise trials have been conducted in acute dementia care settings."
    - "In general, the analysis of the included trials indicates positive effects of exercise programs on BPSD."

Forbes, 2015 (6)

- COCHRANE
- AMSTAR: 90.91
- Intervention: exercise programs
- Setting: mostly nursing homes, as well as graduated residential care, psychiatric facilities, three different types of institutions and their own home.
- Main findings:

- "The studies showed no evidence of benefit from exercise on cognition, psychological symptoms [including aggression/agitation], and depression. There was little or no evidence regarding the other outcomes listed above. There was no evidence that exercise was harmful for the participants. We judged the overall quality of evidence behind most of the results to be very low."
- "…we found no significant effect of exercise on challenging behaviours (one study, 110 participants; MD -0.60, 95% CI -4.22 to 3.02),"
- "Neuropsychiatric symptoms (one trial; 110 participants) Holliman 2001, Rolland 2007, Steinberg 2009, Stevens 2006, and Van de Winckel 2004 examined the effect of exercise on neuropsychiatric symptoms [including aggression/agitation]. Holliman 2001 did not provide the SDs when using the PGDRS behaviour scale, but did report that participants showed improved behaviour only during group sessions, and not outside the group. Steinberg 2009 and Stevens 2006 did not provide useable data. Stevens 2006 reported that the participants in the exercise program showed improvement in behaviour, while Steinberg 2009 reported increased neuropsychiatric symptoms. Van de Winckel 2004 also did not provide useable data and reported no significant behavioural effects. At 12 months, the Rolland 2007 study revealed no clear effect of exercise on neuropsychiatric symptoms (MD -0.60, 95% CI -4.22 to 3.02, P value 0.75; 1 trial, 110 participants).We considered this to be very low quality evidence (an imprecise result from a single study, publication bias; see Summary of findings for the main comparison)."

Livingston, 2014a (23)

- AMSAR: 63.64
- Intervention type: Sensory, psychological and behavioural interventions (activities, music therapy, sensory interventions, training caregivers, light therapy, home-like care, training carers, exercise, changing environment, dementia-specific therapies, pet therapy.
- Settings: care homes/hospitals, community and domestic interventions.
- Main Findings: Exercise: "Insufficient evidence";
  - "There is no convincing evidence that exercise as an intervention is therapeutic for agitation in care homes. The evidence is of generally low standard, precluding confident conclusions."

Horticultural Therapy

Summary

- Determined that there was insufficient primary research evidence to reach conclusion: Whear, 2014

Whear, 2014

- AMSTAR: 72.73
- Intervention: gardens and horticultural therapy. The description of interventions was generally poor in all studies.
- Settings: LTC
- Main Findings:
  - "Three garden studies measured agitation before and after exposure to a garden environment and all used the Cohen-Mansfield Agitation Inventory (CMAI). All studies

reported a positive trend with CMAI scores, indicating reduced agitation associated with visiting the garden (P < .01); for example, Detweiler and colleagues indicate an effect size of d = 0.64. Three studies measured dementia-related behaviors before and after horticultural therapy. Two studies used an RCT design and report mixed results on the effectiveness of horticultural therapy in reducing physical and nonphysical aggression (also using CMAI). A positive trend was seen in the verbal agitation scores in both studies. Vuolo also found a positive trend in the effect of horticultural therapy on physical and verbal aggression and a reduction in physically nonaggressive behaviors in a pre-post study of 50 residents with dementia, but the positive changes were not statistically significant"

- "the data and studies included in the review did not allow meta-analyses to be conducted and the picture remains relatively vague regarding the true benefits of the use of gardens for residents with dementia. In particular, the results of this review may be at risk of bias from the low number of RCTs, inconsistencies in study design and data analysis, lack of blinding (of outcomes), small sample sizes, unclear baseline details, and sometimes invalidated data collection tools, all of which limit the power and decrease the reliability and generalizability of the results."
- "There are promising impacts on levels of agitation in care home residents with dementia to spend time in a garden, although the topic is currently understudied and undervalued."

Humour Therapy

Summary

- Determined that there was insufficient primary research evidence to reach conclusion: Brassure, 2016

Brasure, 2016 (17)

- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: "Humour Therapy: Insufficient"
  - "One trial with study limitations and imprecise estimates provided insufficient evidence regarding the effectiveness of this intervention."

Light Therapy

Summary

- Interpreted as being effective (narrative analysis, qualitative): Whear, 2014
- Demonstrated or interpreted that evidence shows no effectiveness: Brasure, 2016; Forbes, 2014 (Cochrane); Livingston, 2014a;

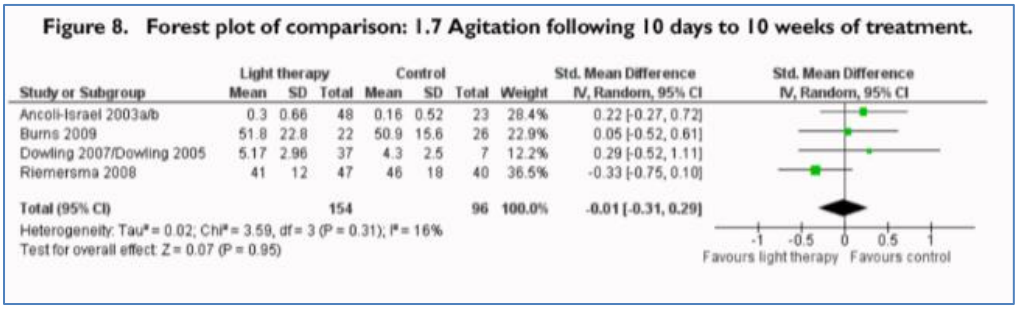
Brasure, 2016 (17)

- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: "Low strength, no improvement"

- "Bright Light Therapy. Light therapy interventions included some variant of bright light therapy. Four trials that studied the efficacy of light therapy had acceptable risk of bias. 41 - 44 Interventions involved exposure to bright light, defined variably as 2,500 lux, greater than 2,500 lux, and 10,000 lux. Comparison groups received exposure to standard light (100 to 250 lux), dim red light, or no treatment. Bright light therapy sessions were typically 1 to 2 hours per day at varying times of day. Treatment durations ranged from 10 days to 10 weeks.
- Bright light efficacy trials enrolled a total of 225 nursing home residents. Two trials provided data on aggression/agitation , measured with the CMAI , sufficient for pooling. The pooled standardized mean difference in aggression/agitation for these two tri als was 0.09 (95% CI , - 0.32 to 0.50). Low - strength evidence shows that bright light therapy is similar to standard light in managing aggression/agitation in dementia. Evidence was insufficient for other outcomes and harms."

Forbes, 2014 (5)

- AMSTAR: 90.01
- Settings: nursing homes primarily
- Main findings: Quantitative, no effect.
  - "Six studies measured agitation: using the agitated behaviour rating scale, and the cohen-mansfield agitation inventory."
  - "No significant evidence was found that light therapy… decreased challenging behaviours, or improved psychiatric symptoms including depression. Indeed, the four included trials that examined challenging behaviours (that is agitation) revealed that light therapy was not effective when administered in the morning, afternoon, evening, or all day at from 10 days to 10 weeks and with treatment lasting up to two years."
  - **Figure 8. Forest plot of comparison: 1.7 Agitation following 10 days to 10 weeks of treatment.**



- Notes: this is a Cochrane.

Livingston, 2014a (23)

- AMSTAR: 63.64
- Intervention type: Sensory, psychological and behavioural interventions (activities, music therapy, sensory interventions, training caregivers, light therapy, home-like care, training carers, exercise, changing environment, dementia-specific therapies, pet therapy.
- Settings: care homes/hospitals, community and domestic interventions.
- Main Findings: "No evidence of efficacy";
  - "Light therapy does not show efficacy for emergent agitation, symptomatic agitation, or severe agitation in care homes. There is preliminary evidence that light therapy worsens agitation."

- "Efficacy: –1.3 to –0.6"; "Sensory interventions target perceived understimulation of the person with dementia, and ranged from those focused purely on touch, such as massage, to multisensory interventions involving tactile, light and auditory stimulation, such as 'snoezelen'. All 13 studies took place in care homes. Some used 'therapeutic touch,' which was defined as a healing-based touch intervention designed to focus on the person as a whole. Trials of therapeutic touch found no significant improvements relative to other touch interventions.65,67,68 There was one large trial that did not specify presence of agitation as an entry criterion, which showed significant improvement.74 The studies with participants with symptomatic and clinically significant agitation also showed an improvement compared with usual care.44,63,66,69–73 The SES ranged from –0.6 to –1.3. There were three studies which looked at outcomes between 1 and 3 weeks later: two found no improvement and one found a significant reduction."

Massage / Therapeutic Touch / Acupuncture / Acupressure

Summary

- Demonstrated or interpreted that evidence shows no effectiveness: Livingston, 2014a;
- Determined that there was insufficient primary research evidence to reach conclusion: Brasure, 2016 (studied all separately)

Brasure, 2016 (17)

- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: "All interventions in this category: Insufficient"
  - Acupressure: "One trial with study limitations and imprecise estimates provides insufficient evidence for the effectiveness of this intervention."
  - Acupuncture: "One trial with study limitations and imprecise estimates provided insufficient evidence for the effectiveness of this intervention"
  - Massage: "evidence is insufficient to draw conclusions about the effect of massage on aggression/agitation or general behavior among nursing home residents with dementia"
  - Massage Versus Ear Acupuncture: "One trial with study limitations and imprecise estimates provided insufficient evidence for the comparative effectiveness of these interventions."
  - Therapeutic Touch: "Evidence was insufficient to draw conclusions regarding the effectiveness of therapeutic touch for aggression/agitation or general behavior in dementia. Evidence for all other outcomes and adverse effects was insufficient."

Livingston, 2014a (23)

- AMSTAR: 63.64
- Intervention type: Sensory, psychological and behavioural interventions (activities, music therapy, sensory interventions, training caregivers, light therapy, home-like care, training carers, exercise, changing environment, dementia-specific therapies, pet therapy.
- Settings: care homes/hospitals, community and domestic interventions.
- Main Findings: Sensory Interventions: "No significant improvements";

- "Sensory interventions target perceived understimulation of the person with dementia, and ranged from those focused purely on touch, such as massage, to multisensory interventions involving tactile, light and auditory stimulation, such as 'snoezelen'. All 13 studies took place in care homes. Some used 'therapeutic touch,' which was defined as a healing-based touch intervention designed to focus on the person as a whole. Trials of therapeutic touch found no significant improvements relative to other touch interventions.65,67,68"

Multisensory Stimulation Room

Summary

- Determined that there was insufficient primary research evidence to reach conclusion: Brasure, 2016

Brasure, 2016

- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: "Multisensory stimulation room: Insufficient"
  - "One small trial with study limitations and imprecise estimates provided insufficient evidence regarding the effectiveness of this intervention."

Music Therapy

Summary

- Demonstrated to be effective (meta-analysis, quantitative): Chang, 2015; Livingston, 2014a; Tsoi, 2017
- Interpreted as being effective (narrative analysis, qualitative): Blackburn, 2014; Travers, 2016;
- Demonstrated or interpreted that evidence shows no effectiveness: Brasure, 2016; Van der Steen, 2017; Tsoi, 2017
- Determined that there was insufficient primary research evidence to reach conclusion: Konno, 2014

Blackburn, 2014 (16)

- AMSTAR: 36.36
- Setting: All LTC
- Main Findings:
  - Quantitative
  - Effective
  - "…the true effect of MT in reducing depression, anxiety or agitated behaviours or improving QOL remains uncertain."
  - "…we believe that the evidence we have reviewed is promising and suggests that MT is a safe non-pharmacological intervention that may reduce agitated and distressed behaviour in older people with dementia and improve the quality of therapeutic interactions between them and their caregivers. Furthermore, MT is inexpensive and uncomplicated to deliver and has strong potential for wide-scale implementation in

routine practice settings. Mental health nurses and other care workers who work in residential settings should consider the potential utility of MT for their client group."

Brasure, 2016 (17)

- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: "Low strength, no improvement"
    - "Four of the trials compared music interventions with usual care, no treatment, and attention controls. 29 - 32 Trials were conducted in Italy, Japan, Taiwan, and the United States. Inclusion criteria varied; most trials required that participants have behavioral symptoms as well as a diagnosis of dementia. In two trials the music interventions were delivered to groups of residents , 30 , 31 and in the other two the interventions were individualized. 29 , 32 Music intervention sessions varied in length (10 to 30 minutes), frequency (1 time, weekly, 3 times per week) , and duration (1 time to 6 months). Type and number of staff involved in the intervention also varied. Trials assessing the efficacy of music interventions enrolled a total of 233 nursing home residents. 29 - 32
    - "The Remington trial 32 differed notably from the three other music intervention trials in that it measured effects immediately and within 30 minutes of the intervention ; the remaining trials evaluated the longer term effect of music therapy by measuring outcomes at a variety of time points during several weeks. The Remington study showed a benefit for the music intervention for aggression/agitation. 32 The other three trials failed to show a statistically significant improvement over usual care, no treatment, or attention control. Pooled results from two of these trials showed similar effects with music and control. Evidence was insufficient to conclude whether music interventions reduce aggression/agitation immediately after participation. Low - strength evidence shows that music ES - 11 interventions are similar to usual care, no treatment, or attention control in decreasing aggression/agitation in individuals with dementia.
    - "Four trials enrolling a total of 218 nursing home residents with dementia and behavioral symptoms compared music interventions with other therapies. 29 , 32 - 34 None showed a difference between music interventions and any other inter active intervention (including other music interventions, interactive reading, recreational activities, and hand massage) on agitation/ aggression. Low - strength evidence suggests that music interventions are similar to inter active comparisons at decreasing aggression/agitation in dementia. Two of these trials al so reported a general behavior outcome with conflicting results , resulting in insufficient evidence to draw conclusions about efficacy. Music interventions and inter active comparisons had similar effects on general behavior outcomes. Evidence was insufficient to assess the comparative effectiveness of music interventions versus other inter active interventions on general behavior."

Chang, 2015 (18)

- AMSTAR: 54.55
- Setting: Unclear
- Main Findings:
    - Quantitative, Effective

- "Music therapy significantly improved disruptive behaviours [Hedges' g = −0·66; 95% confidence interval (CI) = −0·44 to −0·88] and anxiety levels (Hedges' g = −0·51; 95% CI = −0·02 to −1·00) in people with dementia."
- "The overall results reflected that music therapy exerted a moderately high to moderate effect on disruptive behaviours, anxiety and depressive moods. These results were consistent with those of previous studies (Gerdner & Swanson 1993, Brotons & Marti 2003) and indicated that individual music therapy should be provided once a week to patients with cognitive functioning problems, and group music therapy should be provided several times a week to patients with disruptive behaviours to reduce anxiety levels and depressive moods."

Konno, 2014 (22)

- AMSTAR: 54.55
- Interventions: music therapy, person centered bathing, ability focused morning care, caregiver education, mouth care.
- Settings: nursing home, special care unit, LTC, cognitive support unites, aged care facilities.
- Main findings:
  - **Interventions with environmental control: "**Ten interventions involved environmental control. Of these, six were mealtime music interventions, three pertained to bathing care and one was a music intervention for morning care. Of 10 studies reporting on environmental control interventions, seven reported statistically significant reductions of aggressive behaviours, despite differences in the measurement methods and observation intensity between the studies(Table 1). The remaining three studies presented only descriptive data (Denney 1997, Richeson & Neil 2004,Hicks-Moore 2005), so the authors of this review calculated the statistical significance in these studies. The incidence rate of resistance-to-care behaviour per observed unit in the pre-intervention period was treated as the expected rate and incidence rate in the post intervention period was treated as the observed rate. When the statistical significance of this standard incidence ratio was tested using the chi-square test (Checkoway et al. 1989), all three studies showed statistically significant reductions in resistant-to care behaviours. A few studies reported substantial fluctuations in the occurrence of agitation in some participants."

Livingston, 2014a (23)

- AMSTAR: 63.64
- Intervention type: Sensory, psychological and behavioural interventions (activities, music therapy, sensory interventions, training caregivers, light therapy, home-like care, training carers, exercise, changing environment, dementia-specific therapies, pet therapy.
- Settings: care homes/hospitals, community and domestic interventions.
- Main Findings: "Efficacy: –0.8 to –0.5"; "(with specific protocol) "
  - "There were 10 studies of group music therapy following a specific protocol; these were led by a trained therapist and, for example, included a warm-up of a well-known song, and a period of listening to, followed by joining in with, music.53–62 All took place in care homes, except one which was in a day centre.61 A reasonable-quality study of music therapy for people with some symptoms of agitation found a significant

improvement in the intervention group during the time of the intervention, while two others did not. The largest study included participants irrespective of whether or not they were agitated, and found that music therapy, twice per week for 6 weeks, improved the mean level of agitation symptoms.44 Three studies considered the longer-term outcome in periods ranging from 3 to 8 weeks, and none found that it continued to be effective.53,56,60 As the SES was calculated using only the first and last time periods for papers with multiple time points, some of our results differ from the original papers. They ranged from –0.5 to –0.8.

- "In care homes, music therapy by protocol is effective for emergent agitation and decreasing symptomatic agitation, but has no long-term usefulness in agitation.
- "There is no evidence for people with severe agitation. There is minimal evidence outside care homes."

Travers, 2016 (11)

- AMSTAR: 72.73
- Settings: RACF/LTC/Nursing home/Permanent care
- Main Findings:
  - **Music therapy:** "Four studies with a total of 122 participants assessed agitation as an outcome following MT and all reported some positive findings. Of the four studies, three specified that participants had symptoms of agitation in addition to dementia. Significantly reduced agitation was found in a small study of eight participants during MT (P < 0.0001), while reduced agitation was reported in participants who had received four weeks of group MT in combination with movement (F ¼ 15.03, P < 0.001)48 compared to a control (usual care) condition. By comparison, two studies showed reduced levels of agitation in both control and intervention groups following the intervention. While the intervention in Askalson's study was very brief (three sessions [30-40 min per session] of group singing, movement and instrument playing), and the control group watched a nature video, significant reductions in agitation for both groups (F ¼ 5.83, P ¼ 0.02) were reported. Similarly, both the MT intervention and control (usual care) groups demonstrated reduced agitation following an individualized MT intervention in Janata's study (F ¼ 4.98, P < 0.0001)."
  - "While the studies of individualized MT included in this review were all small in scale, overall the findings suggest that the intervention may have positive effects on a range of symptoms in people with dementia living in RACFs, particularly agitation that was the most frequently assessed outcome. Positive outcomes were reported even with small doses of MT,23 and incidental exposure to music35 for group and individual MT and in studies that involved listening to preferred music as well as those that included active participation (e.g. singing and movement), suggesting that mode of delivery may not be a critical factor for effectiveness. Further, the finding that agitation was also significantly reduced in participants who had been exposed to music incidentally 35 suggests that personalizing music may not be essential. The finding that agitation was also reduced in participants who had watched a nature video23 but not in those who received usual care48 also suggests that it may not be music per se that is key, but it may be the introduction of a novel activity along with the increased individual attention associated with the implementation of such activity, or either, that is the key ingredient for

effectiveness. However, head-to-head comparisons are required to formally assess whether these elements influence outcomes."

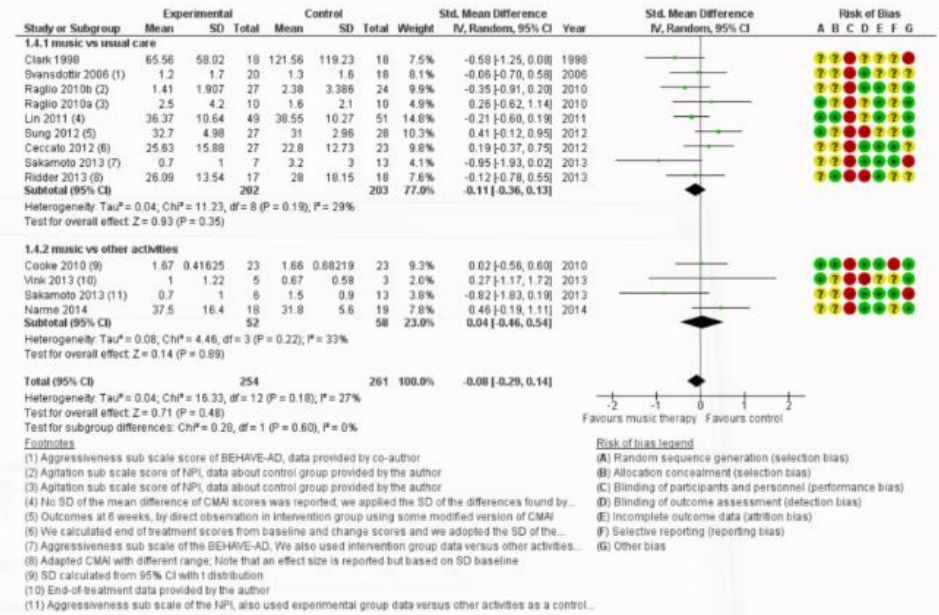
Tsoi, 2017 (27)

- AMSTAR: 54.55
- Intervention: interactive and receptive music therapy. Agitation was a secondary outcome.
- Setting: Nursing home, few in patient.
- Main findings:
    - "There was also no significant difference in other 5 domains between participants with dementia receiving interactive music therapy and usual care, included apathy (NPI-apathy: I2 ¼ 97%, MD ¼ 1.48, 95% CI 3.86 to 0.89), anxiety symptoms (RAID: MD ¼ 0.67, 95% CI 6.34, 5.00), depressive symptoms (GDS-30: I2 ¼ 40%, MD¼1.00, 95% CI¼3.43 to 1.42), agitation (CMAI: I2 ¼ 75%, MD¼1.34, 95% CI¼2.83, 0.14), and behavioral problems (NPI: I2 ¼ 95%, MD¼6.08, 95% CI 12.66 to 0.51)."
    - "Participants who received receptive music therapy showed significant decrease in psychiatric symptoms and behavioral problems than usual care in other 4 domains, including… agitation (CMAI: I2 ¼ 88%,MD¼7.99, 95% CI15.11 to 0.87), and behavioral problems (NPI: I2 ¼ 70%, MD ¼ 3.02, 95% CI 5.90 to 0.15)."
    - Sub group analysis:
        - "Participants with moderate-to-severe dementia receiving receptive music therapy showed significant decrease in anxiety symptoms than usual care group (RAID: MD ¼ 1.83, 95% CI 3.60 to 0.06), but no significant difference in cognitive function, agitation, and behavioral problems"
        - "Five studies used the design of RCT to compare receptive music therapy and usual care. The results showed that participants with dementia receiving receptive music therapy had significant decrease in psychiatric symptoms and behavioral problems, including apathy (NPI-apathy: MD ¼ 1.48, 95% CI 2.13 to 0.83), anxiety symptoms (RAID: MD ¼ 1.83 95% CI 3.60 to 0.06), agitation (CMAI: MD ¼ 7.99, 95% CI 15.11 to 0.87), and behavioral problems (NPI: MD ¼ 3.02, 95% CI 5.90 to 0.15)."

Van der Steen, 2017 (12)

- AMSTAR: 100.00
- Setting: included people living in diverse settings including the community, hospitals or nursing homes.
- Main findings:
    - Quantitative, no effect

Figure 9. Forest plot of comparison: 1 Music therapy versus usual care or versus other activities: end of treatment, outcome: 1.4 Problematic behaviour: agitation or aggression.



- "Twelve studies with 515 participants contributed to the end-of-treatment effect analysis, and four studies with 225 participants contributed to the long-term effect analysis. Outcome measures used for agitation were (translated versions of) the Cohen-Mans-field Agitation Inventory (CMAI) and the agitation subscale of the NPI; and for aggression, the aggressiveness subscale of the BEHAVE-AD and counts of observed aggressive behaviour. Heterogeneity was low to moderate at end of treatment and longer term (I^2 = 27%, Chi^2 P = 0.18, and I^2 = 37%, Chi^2 P = 0.19,respectively). Inconsistency and imprecision were not serious for the end-of-treatment outcome, but inconsistency was serious for the long-term outcome, as was imprecision. Both outcomes were downgraded for risk of bias. There was no evidence of publication bias (regarding end-of-treatment effect; Figure 5). We rated the quality of the evidence as moderate for the end-of-treatment outcome but very low for the long-term outcome. We found no evidence of an effect on agitation or aggression at the end of treatment (SMD −0.08, 95% CI −0.29 to 0.14; Summary of findings for the main comparison ; Analysis 1.4 and Figure 9) nor in the long term (SMD −0.02, 95% CI −0.36 to 0.33; ;Summary of findings 2; Analysis 2.4)"

- Notes: this is a Cochrane.

- Table 3. Summary Results of Interventions

Title	Date	Intervention	Setting (Country)	Design	Size	Size and Duration (Width of lines proportional to N; weeks: 0 2 4 6 8 10 12)	Outcomes (CMAI): Phys. Non-AB	Physical AB	Verb. Non-AB	Verbal AB	Hide/hoard	Total	Outcomes (GBS): Confusion	Irritability	Anxiety	Fear-panic	Depression	Restless	Motor	Intellect	Emotion	Outcomes (other): COMFI	MAST	Agitation	Participat	Communicat	ABCD
Chang	2010	Music	Dem institution (Taiwan)	time series	N=41	no music / music	▽	▲	△	▲		▲															
Denney	1997	Music	Dem institution (USA)	time series	N=9	no music / music	△	△		△	–	△															
Goddaer	1994	Music	Nursing home (Belgium)	time series	N=29	no music / music	▲	△		▲	△	▲															
Hicks-Moore	2005	Music	Dementia Unit (Canada)	time series	N=30	no music / music	△	△		△	△	△															
Ho	2011	Music	Nursing home (Taiwan)	pre-post	N=22	no music / music	▲	▲	▲	▲		▲															
Ragneskog	1996	Music	Dementia Unit (Sweden)	time series	N=24	no music / music							△	▲	△	▲	▲	△	▽	▽	▽						
Richeson	2004	Music	Dementia Unit (USA)	time series	N=27	no music / music	△	△		△	–	△															
Brush	2002	Dining environment	Nursing home (USA)	pre-post	N=25	no intervention / intervention																△	△				
Koss	1998	Dining environment	Dementia Unit (USA)	pre-post	N=13	no intervention / intervention																		▲			
Altus	2002	Food service	Dementia Unit (USA)	time series	N=5	no intervention / intervention																				△	△
Santo Pietro	1998	Group conversation	Dementia Unit (USA)	controlled trial	N=40	intervention / control																					▲

Key
▲ positive outcome ($p < 0.05$)
△ positive outcome ($p > 0.05$) or no significance reported
– no difference
▽ negative outcome ($p > 0.05$) or no significance reported
▼ negative outcome ($p < 0.05$)

Pain Treatment

No new systematic reviews found.

Personalized Activities

Summary

- Demonstrated to be effective (meta-analysis, quantitative): Livingston, 2014a (emergent and symptomatic); Travers, 2016
- Interpreted as being effective (narrative analysis, qualitative):
- Demonstrated or interpreted that evidence shows no effectiveness: Brasure, 2016; Livingston, 2014 (“additional” and severe dementia)
- Determined that there was insufficient primary research evidence to reach conclusion:

Brasure, 2016 (17)

- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: “Low strength, no improvement”
    - Comparisons between tailored and nontailored interventions:
        - The interventions varied on the resident characteristics used for tailoring. One tailored the intervention based on patient preferences and abilities, one on the Montessori model, another on the unmet needs, and the fourth on balancing arousal throughout the day according to the patients' response to different activities.

        - Four trials studied tailored activities for aggression/agitation in dementia. Only one trial showed reduced aggression/agitation with tailored activities compared with nontailored activities and one showed higher aggression with intervention compared with usual care. These studies had methodologic limitations and imprecise estimates. In addition to the inconsistency, this rendered the evidence insufficient to draw conclusions regarding the effectiveness of tailored activities compared with nontailored activities.
    - Comparisons between different tailored activity interventions
        - Studies tested the Needs-Driven, Dementia-Compromised Behavior model, which posits that activities for individuals with BPSD must fit the physical and cognitive functional abilities and personality of the resident
        - Two studies assessed the effect of interventions tailored to different resident characteristics. Low strength evidence shows that interventions tailored to different patient characteristics have a similar effect on managing aggression/agitation in dementia.

Livingston, 2014a (23)

- AMSTAR: 63.64
- Intervention type: Sensory, psychological and behavioural interventions (activities, music therapy, sensory interventions, training caregivers, light therapy, home-like care, training carers, exercise, changing environment, dementia-specific therapies, pet therapy.
- Settings: care homes/hospitals, community and domestic interventions.
- Main Findings: Personalized Activities: "Efficacy: –0.8 to –0.6";
    - "Overall, activities in care homes reduce emergent agitation and decrease symptomatic agitation in care homes during the time they are in place. Individualising activities does not appear to make significant additional reductions in agitation. There is no evidence for those who are severely agitated or who are not in care homes."

Travers, 2016 (11)

- AMSTAR: 72.73
- Settings: RACF/LTC/Nursing home/Permanent care
- Main Findings:
    - **Individualized recreational activities:**

*Kolanowski, 2005: scores are baseline and follow-up scores for the group that received activities matched to their personality style of interest; Kolanowski, 2011: scores are for the "activities matched to interest" and active control groups

Figure 2: Meta-analysis for recreational therapy compared to control* for agitation as measured by the Cohen-Mansfield Agitation Inventory (CMAI)

- **Social interaction: "**A significant decrease in agitation (the primary outcome) as measured by the CMAI was reported following the implementation of BPST (mean

improvement ¼ 6.7, t ¼ 6.5, df ¼ 197, P < 0.0001). The effect was evident, however, only when social interaction was the intervention with 43% of participants experiencing clinically significant improvement (mean improvement ¼ 7.1, t ¼ 6.4, df ¼ 165, P < 0.0001). By comparison, the agitation scores of those who had received either the removal of environmental triggers (4.5%) or personalized music (18%) did not change following the intervention compared to previously."

Pleasant Experiences

Summary

- Determined that there was insufficient primary research evidence to reach conclusion: Brasure, 2016

Brasure, 2016 (17)

- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: "Pleasant Experiences: Insufficient"
    - "One trial with study limitations and imprecise estimates provides insufficient evidence regarding the effectiveness of this intervention"

Reducing Inappropriate Use of Anti-Psychotics

Summary

- Demonstrated or interpreted that evidence shows no effectiveness: Pan, 2014 (made patients worse)
- Determined that there was insufficient primary research evidence to reach conclusion: Disalvo, 2016; Jutkowitz, 2016;

Brasure, 2016 (17)

- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: Protocols to reduce antipsychotics: Insufficient
    - Three studies used staff training and clinical protocols to reduce the use of antipsychotics.
    - "Evidence was insufficient to draw conclusions regarding efficacy of interventions on reducing antipsychotic use, aggression/agitation, or any of the secondary outcomes. Rapp et al. reported a small but significant reduction in mean defined daily dose of antipsychotics in the intervention group. Zwijsen et al. also found a small reduction in the number of antipsychotics prescribed. In contrast, Fossey et al. reported no difference between intervention and control in terms of total antipsychotic use or dosing. To pool results, we standardized the mean between treatment group differences of antipsychotic dose. Results from Zwijsen et al. could not be pooled due to insufficient data regarding sample sizes in each treatment group. Figure 7 shows the forest plot of the effect of the interventions on antipsychotic dose. The pooled results indicated that the interventions had no effect on antipsychotic dose (standardized mean

difference -0.28; 95% CI: -3.50 to 2.94). The meta-analysis model had an I2 of 89 percent and a Tau of 0.34."

- "For aggression/agitation, Fossey et al. reported a null effect for the intervention. In contrast, Rapp et al. and Zwijsen et al. found significant reductions in aggression/agitation for the intervention group. To pool results, we evaluated the mean between treatment group differences at final period of postintervention on CMAI. Figure 8 shows the forest plot of the effect of interventions on aggression/agitation as measured by the CMAI. Again, results from Zwijsen et al. could not be pooled due to insufficient data. In pooled results, these studies had no effect on aggression/agitation (mean difference -4.5; 95% CI: -38.84 to 29.93). The meta-analysis model had an I2 of 32 percent and a Tau of 2.39."
- "Although many trials have been conducted to determine effective nonpharmacologic interventions for aggression/agitation in dementia, which is a critical topic, the evidence base is weak because of the variety of comparisons, measurement issues, and other methodological limitations. When evidence was sufficient to draw conclusions about effectiveness for a group of interventions, aggression/agitation outcomes were typically similar to those of control groups. Future research is needed to guide providers and informal caregivers toward effective interventions for aggression/agitation in dementia."

Disalvo, 2016 (19)

- AMSTAR: 63.64
- Setting(s): LTC + other
- Main Findings:
  - *Systems to identify potentially inappropriate prescribing in people with advanced dementia*
  - "Synthesis of results: Five of the eight studies used the same system for identifying potentially inappropriate medications - that was developed by the Palliative Excellence in Alzheimer Care Efforts (PEACE) Program reported by Holmes et al. (2008). In the PEACE program, medications were audited for 34 patients with advanced dementia where a palliative approach was deemed appropriate. In a three-round modified Delphi process, 12 geriatricians rated each medication identified via the audit as 'never', 'rarely', 'sometimes' or 'always' appropriate. Consensus for a medication or medication class was defined as agreement on categorisation by >50 % (i.e. at least 7/12) participants. See Table 3 for drug classes in each category according to the final consensus. Following Holmes and colleagues' preliminary study, four other international studies utilised the PEACE criteria to rate the appropriateness of medications taken by large cohorts of aged care residents with advanced dementia and examine predictors of taking 'never' appropriate medications among socio-demographic and clinical variables. See Table 4 for a summary of these studies' samples and results. Blass et al. (2008) used a more rudimentary index of potentially inappropriate prescribing in people with advanced dementia based purely on number of medications. The study identified that nursing home residents with advanced dementia received a mean of 14.6 medications (±7.4) and that, as residents approached death, the type but not number of medications altered. The study identified an increase in medications for symptom control (i.e.

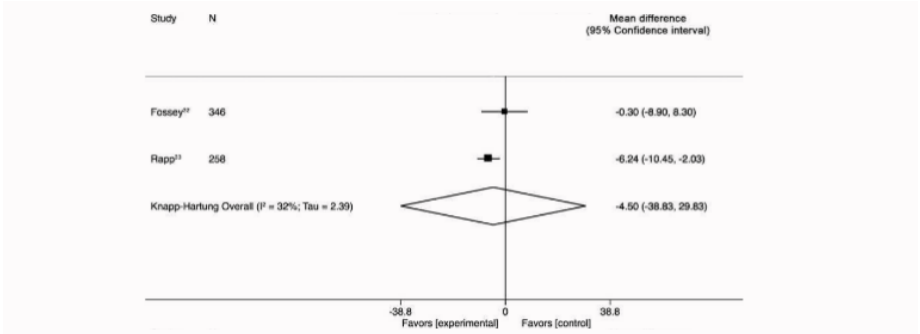
opioids and laxatives) and a decrease in medications for comorbid conditions (i.e. antibiotics, anti-dementia drugs, cardiovascular agents and psychotropic agents). Two studies by Shega et al. (2009) and Parsons et al. (2014) explored factors influencing medication-related decisions by physicians (hospital medical directors, general practitioners and hospital physicians), specifically their continuation or discontinuation in dying patients with dementia. Physicians from both studies recommended discontinuation of anticholinesterase inhibitors and memantine because of perceived lack of clinical benefit during end-stage of illness, but were less likely to recommend this if there was any indication that they stabilised cognition, reduced challenging behaviours or maintained patient function. Physicians also recommended discontinuing quetiapine and simvastatin because of a perceived lack of indication and/or risk of adverse effects such as confusion [21]. Emphasis was placed on ensuring patient comfort and symptom management and reducing polypharmacy and preventative treatments."

- "Most commonly inappropriately prescribed drugs: cardiovascular agents, lipid lowering agents, anticholinesterase inhibitors, anti-platelets, anti-hypertensives, memantine."
- *NB: this article is about <u>inappropriate prescribing</u>, not about reducing antipsychotics*
  "Future research is needed to develop and validate systems with clinical utility for improving safety and quality of prescribing in advanced dementia. Systems should account for individual clinical context and distinguish between deprescribing and initiation of medications."

Jutkowitz, 2016 (20)

- AMSTAR: 63.64
- Settings: Nursing homes
- Interventions: dementia care mapping, person-centered care, clinical guidelines to reduce antipsychotics, emotion oriented care, staff training and environmental changes.
- Main findings: *NB: Included 3 studies that looked at <u>clinical guidelines to reduce antipsychotic and other psychotropic drug use</u>*
  - **Clinical protocols: "**In one, prescribers worked with study psychiatrists to review medication use, another used a clinical protocol (used guidelines of American Geriatrics Society and American Association of Geriatric Psychiatry, staff received training on general information about dementia, use of activity-based interventions, prescribers trained in individual session) vs usual care, and the last used Grip on Challenging Behavior where nursing staff, physicians, and psychologist were trained in using a structured analysis form to evaluate behaviors; based on this structured analysis, treatment goals and plans were developed in a multidisciplinary meeting."
  - "In all studies, investigators trained prescribers in appropriate prescribing. Interventions were evaluated using cluster-randomized designs. There is insufficient evidence to show whether these interventions have any effect on antipsychotic and other psychotropic drug use (standardized mean difference = ?0.28; 95% CI = ?3.50 to 2.94, I2 = 89%, tau = 0.34) or on agitation and aggression (Figure 4) as measured by the CMAI (mean difference = ?4.5; 95% CI = ?38.84 to 29.93, I2 = 32%, tau = 2.39). Evidence was

insufficient to draw conclusions regarding efficacy of interventions on general behavior."



gure 4. Random-effects meta-analysis for the effect of clinical protocols on frequency of agitation and aggression as measured ing the Cohen-Mansfield Agitation Inventory. SMD = standardized mean difference; CI = confidence interval.

Pan, 2014 (25)

- AMSTAR: 54.55
- Summarize all related findings to evaluate the risks and benefits of antipsychotic discontinuation in dementia.
- Setting: Nursing homes, LTC and outpatient.
- Main findings: qualitative and quantitative.
    - *NB: Systematic review to evaluate risks and benefits of antipsychotic discontinuation in dementia*.
    - "Most studies investigated the effects of discontinuation of first-generation antipsychotics or risperidone. Five studies discontinued antipsychotics abruptly at baseline, and 5 studies tapered down antipsychotics over 1-3 weeks."
    - "Since the rating scales used to assess BPSD severity were different among these 3 studies, we used Standardized Mean Differences (SMD) to estimate the effect size. The compiled SMD of BPSD severity change showed that the BPSD scores in the antipsychotic discontinuation group increased more than in the continuation group, but that difference did not reach statistical significance (total number of patients: 214, SMD: 0.19, 95% CI: -0.20 to 0.58)."
    - "The compiled results showed that the antipsychotic discontinuation group had a statistically significantly higher proportion of participants with BPSD worsening than the antipsychotic continuation group (total number of patients: 366, Mantel-Haenszel (M-H) test for RR: 1.78, 95% CI: 1.31-2.41)."
    - "The compiled results showed that the antipsychotic discontinuation group had a higher proportion of participants with early study terminations than the antipsychotic continuation group, but there was no statistically significant difference (total number of patients: 462, M-H test for RR: 1.11, 95% CI: 0.87-1.41)."
    - "The compiled results showed that the antipsychotic discontinuation group had a lower proportion of participants dying during the study period than the antipsychotic continuation group, but this difference did not reach statistical significance (total number of patients: 407, M-H test for RR: 0.83, 95% CI: 0.49-1.39)."

- "The results of this study demonstrate that although the proportion of patients with BPSD severity worsening was significantly higher in the antipsychotic discontinuation group compared to the continuation group, there was no statistically significant between-group difference in BPSD severity change. The meta-analysis reported here showed that the mortality rate was lower in the antipsychotic discontinuation group compared to the continuation group; however, there was no statistically significant difference."

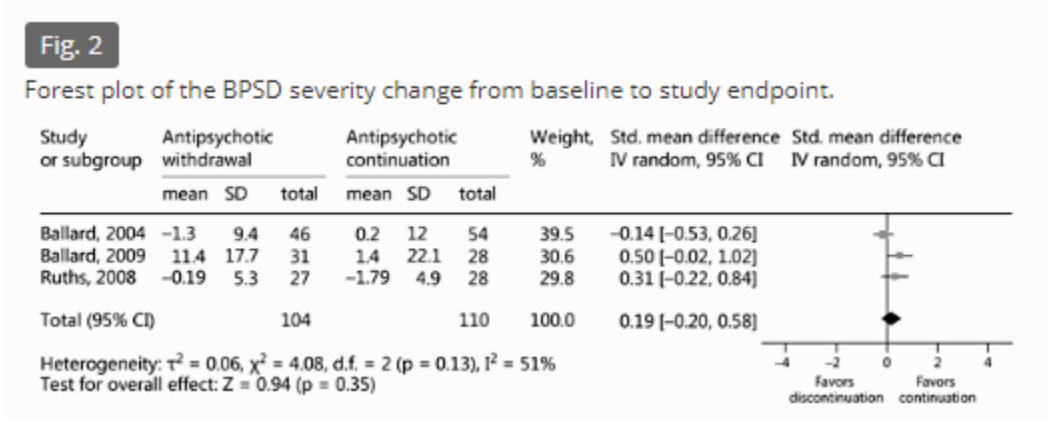


Fig. 2

Forest plot of the BPSD severity change from baseline to study endpoint.

Study or subgroup	Antipsychotic withdrawal mean	SD	total	Antipsychotic continuation mean	SD	total	Weight, %	Std. mean difference IV random, 95% CI
Ballard, 2004	−1.3	9.4	46	0.2	12	54	39.5	−0.14 [−0.53, 0.26]
Ballard, 2009	11.4	17.7	31	1.4	22.1	28	30.6	0.50 [−0.02, 1.02]
Ruths, 2008	−0.19	5.3	27	−1.79	4.9	28	29.8	0.31 [−0.22, 0.84]
Total (95% CI)			104			110	100.0	0.19 [−0.20, 0.58]

Heterogeneity: $\tau^2 = 0.06$, $\chi^2 = 4.08$, d.f. = 2 ($p = 0.13$), $I^2 = 51\%$
Test for overall effect: $Z = 0.94$ ($p = 0.35$)

Std. mean difference IV random, 95% CI

−4 −2 0 2 4
Favors discontinuation | Favors continuation

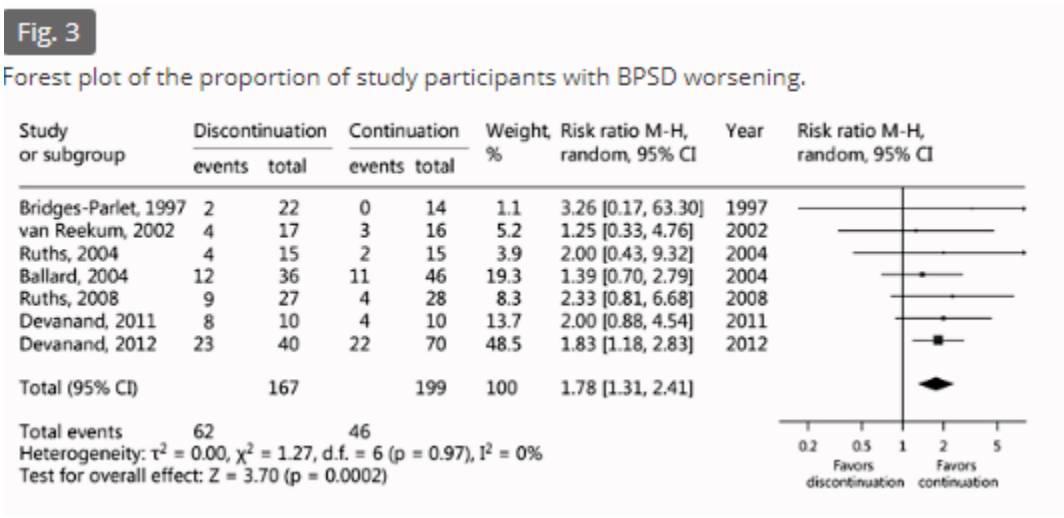


Fig. 3

Forest plot of the proportion of study participants with BPSD worsening.

Study or subgroup	Discontinuation events	total	Continuation events	total	Weight, %	Risk ratio M-H, random, 95% CI	Year
Bridges-Parlet, 1997	2	22	0	14	1.1	3.26 [0.17, 63.30]	1997
van Reekum, 2002	4	17	3	16	5.2	1.25 [0.33, 4.76]	2002
Ruths, 2004	4	15	2	15	3.9	2.00 [0.43, 9.32]	2004
Ballard, 2004	12	36	11	46	19.3	1.39 [0.70, 2.79]	2004
Ruths, 2008	9	27	4	28	8.3	2.33 [0.81, 6.68]	2008
Devanand, 2011	8	10	4	10	13.7	2.00 [0.88, 4.54]	2011
Devanand, 2012	23	40	22	70	48.5	1.83 [1.18, 2.83]	2012
Total (95% CI)		167		199	100	1.78 [1.31, 2.41]	
Total events	62		46				

Heterogeneity: $\tau^2 = 0.00$, $\chi^2 = 1.27$, d.f. = 6 ($p = 0.97$), $I^2 = 0\%$
Test for overall effect: $Z = 3.70$ ($p = 0.0002$)

Risk ratio M-H, random, 95% CI

0.2 0.5 1 2 5
Favors discontinuation | Favors continuation

Reminiscence

Summary

- Determined that there was insufficient primary research evidence to reach conclusion: Brasure, 2016

Brasure, 2016 (17)

- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: "Reminiscence: Insufficient"
  - "One trial with study limitations and imprecise estimates provided insufficient evidence regarding the effectiveness of this intervention."

Simulated Family Presence

Summary

- Determined that there was insufficient primary research evidence to reach conclusion: Abraha, 2017; Brasure, 2016

Abraha, 2017 (3)

- AMSTAR: 100.00
- Setting: All LTC
- Main Findings: Unable to draw any conclusions about the efficacy of simulated family presence for the treatment of behavioral problems.
    - Note: Cochrane

Brasure, 2016 (17)

- Brasure, M., Jutkowitz, E., Fuchs, E., Nelson, V. A., Kane, R. A., Shippee, T., … Kane, R. L. (2016). Nonpharmacologic Interventions for Agitation and Aggression in Dementia. Rockville (MD): Agency for Healthcare Research and Quality (US).
- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: “Insufficient”
    - “Although many trials have been conducted to determine effective nonpharmacologic interventions for aggression/agitation in dementia, which is a critical topic, the evidence base is weak because of the variety of comparisons, measurement issues, and other methodological limitations. When evidence was sufficient to draw conclusions about effectiveness for a group of interventions, aggression/agitation outcomes were typically similar to those of control groups. Future research is needed to guide providers and informal caregivers toward effective interventions for aggression/agitation in dementia."

Special Care Units

Summary

- Determined that there was insufficient primary research evidence to reach conclusion: Soril, 2014 -- Requires special attention for ON

Soril, 2014 (26)

- AMSTAR: 63.64
- Objective of systematic review was to determine the effectiveness of built environment interventions on the frequency and/or severity of BPSD among residents in LTC.
- Setting(s): long term or specialize dementia care
- Main Findings: Qualitative
    - “Two studies examined the impact of several responsive or agitated behaviours following a complete relocation in living environment. Relocation of a small sample of 16 residents from a traditional care unit to a specialized dementia care unit in a single LTC facility resulted in decreased agitation amongst participants, specifically in verbally aggressive behaviour, 6-months post-intervention”

- "In a larger study conducted by Reimer et al. (2004), of 185 residents with dementia, the quality of life, which included measures of responsive behaviours such as agitation, socially appropriate behaviour, social withdrawal and interest in the environment, were compared between participants in traditional LTC facilities (control group) and in a purpose-built specialized dementia care facility [15]. One year post-intervention, the authors found that there was greater sustained interest in the environment, less negative affect, and the overall quality of life was similar or better for the intervention group compared to controls; however, there were no significant differences with regards to concentration, orientation, socially appropriate behaviour, and social withdrawal between study groups."

Staff Case Conferences

No new systematic reviews found.

Staff Training: Dementia Care Mapping

Summary

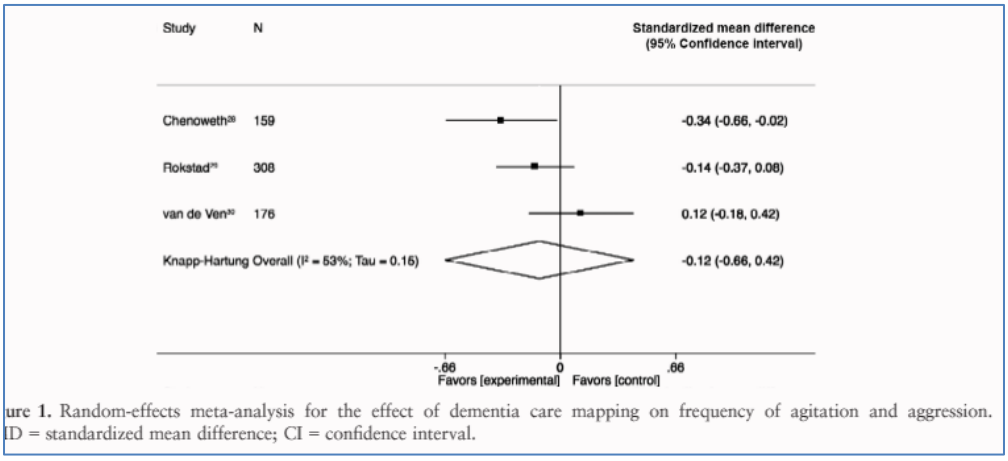
- Demonstrated or interpreted that evidence shows no effectiveness: Brasure, 2016
- Determined that there was insufficient primary research evidence to reach conclusion: Jutkowitz, 2016

Brasure, 2016 (17)

- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: Dementia Care Mapping: Low-strength, no improvement
  - Dementia care mapping is a systematic approach to identifying and strategically responding to presumed causes of aggression/agitation and distress. The process consists of observing care, the environment, and factors associated with resident well-being as identified by behavioral indicators, and then identifying positive and negative aspects of care delivery. Feedback is given to nursing home staff and used to inform action plans. Three trials with acceptable risk of bias evaluated the effectiveness of dementia care mapping in nursing homes using cluster randomized designs.56-58These trials enrolled a total of 643 nursing home residents.
  - "All trials assessed aggression/agitation. Only Chenoweth and colleagues reported an effect in favor of dementia care mapping on the primary measure of aggression/agitation.56Rokstad and colleagues reported mixed results, with a significant improvement for dementia care mapping with one instrument but not another. Both statistically significant results were small and unlikely to be clinically meaningful.56,57Pooled results showed similar effects on aggression/agitation with dementia care mapping and usual care (SMD,-0.12; 95% CI,-0.66 to 0.42; I2=53). Low-strength evidence showed that dementia care mapping is similar to usual care in managing aggression/agitation in dementia. Evidence for all other outcomes and adverse effects was insufficient."

Jutkowitz, 2016 (20)

- AMSTAR: 63.64

- Settings: Nursing homes
- Interventions: dementia care mapping, person-centered care, clinical guidelines to reduce antipsychotics, emotion oriented care, staff training and environmental changes.
- Main findings:
    - "Evidence was insufficient regarding the efficacy of nonpharmacological care-delivery interventions to reduce agitation or aggression in nursing home and assisted living facility residents with dementia"
    - **"**One study reported small but statistically significantly lower frequency of agitation and aggression in favor of DCM.[28] This reduction is unlikely to be clinically meaningful given that a 30% change in the Cohen-Mansfield Agitation Inventory (CMAI) is needed to observe a clinically significant difference.[31] Figure 1 shows the pooled results of the three DCM studies. Low-strength evidence shows that DCM and usual care have a similar effect on the frequency of agitation and aggression (standardized mean difference = −0.12, 95% CI = −0.66 to 0.42, I2 = 53%, tau = 0.15). Evidence was insufficient to draw conclusions on general behavior or antipsychotic and other psychotropic use."
    - 

ure 1. Random-effects meta-analysis for the effect of dementia care mapping on frequency of agitation and aggression. ID = standardized mean difference; CI = confidence interval.

Staff Training: Emotion-Oriented Care

Summary

- Determined that there was insufficient primary research evidence to reach conclusion: Brasure, 2016

Brasure, 2016 (17)

- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: Emotion-Oriented Care: Insufficient
    - "Two studies evaluated emotion-oriented care using cluster randomized designs. Emotion-oriented care consists of understanding the resident's perception of the environment and the role of verbal and nonverbal communication in the caregiver-patient relationship."
    - "This intervention also includes are large staff training component. (either a 2-day basic course or a 6-day training course)"

- "Evidence was insufficient to draw conclusions regarding efficacy of interventions on reducing antipsychotic use, aggression/agitation, or any of the secondary outcomes."
- "Both studies reported no effect for emotion-oriented care on the primary measure of aggression/agitation"
- "Although many trials have been conducted to determine effective nonpharmacologic interventions for aggression/agitation in dementia, which is a critical topic, the evidence base is weak because of the variety of comparisons, measurement issues, and other methodological limitations. When evidence was sufficient to draw conclusions about effectiveness for a group of interventions, aggression/agitation outcomes were typically similar to those of control groups. Future research is needed to guide providers and informal caregivers toward effective interventions for aggression/agitation in dementia."

Staff Training: Person-Centered Bathing

Summary

- Interpreted as being effective (narrative analysis, qualitative): Konno, 2014

Konno, 2014 (22)

- AMSTAR: 54.55
- Interventions: music therapy, person centered bathing, ability focused morning care, caregiver education, mouth care.
- Settings: nursing home, special care unit, LTC, cognitive support unites, aged care facilities.
- Main findings: Qualitative, effective
  - **"**Four studies aimed to improve the caregivers' person-centred bath skills; specifically, to respect the patient's privacy and to improve their comfort during bathing. Five studies used ability-focused interventions that were designed to improve caregivers' assessment skills, specifically, to improve the caregivers' ability to evaluate the patients' abilities and improve their care skills. Person-centred showering (which declined by 53% of baseline, $P < 0.001$) and towel bathing (which declined by 60% of baseline, $P < 0<001$) were associated with significantly lower resistance to care compared with a non-person-centred shower control group. A brief report described the effect of a 30-minute interactive seminar for nurse's aides on the topic of basic person-centred bathing care (Mickus 2002). This pragmatic education programme resulted in a significant reduction of irritability and anxiety but not agitation during bathing in a sample of 23 residents."

Staff Training (Person Centred Care)

Summary

- Demonstrated to be effective (meta-analysis, quantitative): Fossey, 2014 (based on manuals for staff training, described above), Kim, 2017; Livingston, 2014a;
- Interpreted as being effective (narrative analysis, qualitative): Travers, 2016
- Determined that there was insufficient primary research evidence to reach conclusion: Brasure, 2016; Jutkowitz, 2016

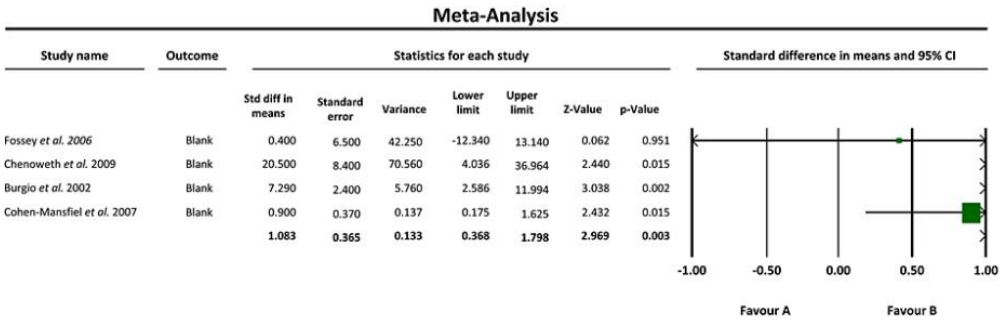
Brasure, 2016 (17)

- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: Person-Centred Care: Insufficient
    - Person-Centred Care (PCC) aims to foster personhood (e.g., positive relationships with others) as dementia progresses.
    - *These studies seemed to really focus on staff training for person centred care.*
    - "All eligible person-centered care studies assessed aggression/agitation. Chenoweth et al. was the only study to report a statistically significant effect of PCC on aggression/agitation. However, because the effect size was unlikely to be clinically meaningful, these results should not be interpreted as evidence of effectiveness due only to the statistical difference. Rokstad et al. reported a statistically significant reduction in aggression/agitation for PCC as assessed with one instrument, but not another. To pool results, we standardized the mean between treatment group differences at the final period of postintervention on the primary measure of aggression/agitation from each study. Figure 6 shows the pooled analysis describing the effect of PCC on aggression/agitation in dementia. Low strength evidence shows that PCC and usual care have a similar effect on aggression/agitation in dementia (standardized mean difference -0.15; 95% CI: -0.67 to 0.38). The meta-analysis model had an I2 of 56 percent and a Tau of 0.14."
    - "Evidence for general behavior and intermediate outcomes was insufficient. Two of the three studies reported general patient behavioral outcomes; of these, Rokstad et al. reported a difference in general patient behavior in favor of PCC, and Chenoweth et al. reported a null effect. PCC had no effect on neuroleptic use or injuries. None of the studies reported staff outcomes."
    - "Although many trials have been conducted to determine effective nonpharmacologic interventions for aggression/agitation in dementia, which is a critical topic, the evidence base is weak because of the variety of comparisons, measurement issues, and other methodological limitations. When evidence was sufficient to draw conclusions about effectiveness for a group of interventions, aggression/agitation outcomes were typically similar to those of control groups. Future research is needed to guide providers and informal caregivers toward effective interventions for aggression/agitation in dementia."

Fossey, 2014 (8)

- AMSTAR: 72.73
- Intervention: Staff training
- Settings: nursing homes/LTC
- Main findings:
    - *This article is straight up about Staff Training for person centred care.*
    - "The meta-analysis clearly shows that person-centred intervention and training packages have a significant positive impact on both agitation and on reducing the use of antipsychotic medications, strongly reinforcing the value of this approach."

- "Only four of the available training and intervention manuals met the stipulated quality criteria and had published clinical trial evidence of efficacy."

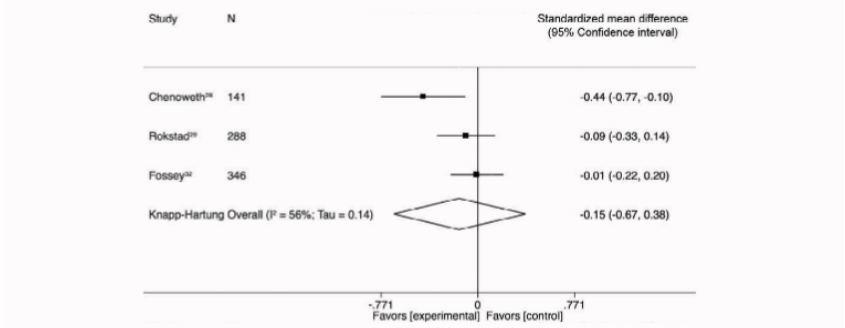


- "A collection of evidence-based protocols for integrating non-drug strategies into the care and treatment of older people with dementia, NEST (Buettner and Ferrario, 1998; Buettner and Fitzsimmons, 2009) and the related manual, 'Simple Pleasures', were evaluated in 60 people in a nursing home over 10 weeks. The study showed improvements in agitation (CMAI p = 0.01) and depression (GDS; p = 0.001). "
- "The 'Simple Pleasures' manual (Buettner, 1999) was evaluated in a 6-month crossover RCT involving 40 individuals, which demonstrated significant improvement in agitation compared with the control period (p = 0.001)."
- "Improving Dementia Care (Loveday et al., 1998) is a practical training and staff development resource for use with care staff to develop an understanding of person-centred care principles and practice, as part of an RCT of person-centred care training and a specific care programme including Dementia Care Mapping (DCM) in 30 care homes (Chenoweth et al., 2009) Outcomes showed a reduction in symptoms of agitation in residents, although the outcomes showed variability between sites (CMAI; p = 0.01). DCM was utilised as a part of this effective intervention, but in a way that is different from routine clinical implementation (Chenoweth et al., 2009). A further RCT of DCM using the more widely implemented method is ongoing in the UK. Three other training programmes have demonstrated evidence of efficacy in clinical trials, but are not available for general implementation."

Jutkowitz, 2016 (20)

- AMSTAR: 63.64
- Settings: Nursing homes
- Interventions: dementia care mapping, person-centered care, clinical guidelines to reduce antipsychotics, emotion oriented care, staff training and environmental changes.
- Main findings:
  - **Person centered care:** "In all three studies, investigators trained select nursing home staff to implement PCC. The degree of investigator involvement after staff training varied."
  - "Evidence was insufficient regarding the efficacy of nonpharmacological care-delivery interventions to reduce agitation or aggression in nursing home and assisted living facility residents with dementia

- "One study reported statistically significant less agitation and aggression in favor of PCC (<30% change in CMAI score), but it was unlikely to be clinically meaningful. Figure 2 summarizes the pooled analysis of the effect of PCC on the frequency of agitation and aggression in dementia. Low SOE shows that PCC and usual care have a similar effect on the frequency of agitation and aggression Evidence was insufficient to draw conclusions on general behavior or antipsychotic and other psychotropic use."



igure 2. Random-effects meta-analysis for the effect of person-centered care on frequency of agitation and aggression. SMD = s-andardized mean difference; CI = confidence interval.

-

Kim, 2017 (21)

- AMSTAR: 63.64
- Interventions: Person Centered Care.
- Settings: LTC, nursing homes, special care units, subjects home (mostly LTC and nursing)
- Main findings: Quantitative, not better than individualized activities.
  - "Eleven of the 19 studies included staff education and training on empathy and person-centeredness and feedback for care staff, with long intervention duration that ranged from 3 months to 2 years."
  - "Fifteen studies examined effects of PCC on agitation using Cohen–Mansfield agitation inventory, agitation behavior mapping instrument, and Brief Agitation Rating Scale and positive effects were observed in eight studies, including two studies that were not eligible for meta-analysis. The meta-analysis on the effectiveness of PCC on agitation included 12 studies (Figure 2). On pooling data from 11 RCTs, the result favored a PCC intervention (SMD: −0.226; 95% CI: −0.350 to −0.095). Short-term PCC interventions had a greater effect (SMD: −0.434; 95% CI: −0.701 to −0.166) compared with long-term interventions (SMD: −0.098; 95% CI: −0.190 to 0.007). There was a significantly greater effect of individualized activities (SMD: −0.513; 95% CI: −0.994 to −0.032) compared with staff training or culture change intervention (SMD: −0.160; 95% CI: −0.274 to −0.046). Groups with smaller numbers of individuals with severe dementia had significantly improved effects (SMD: −0.297; 95% CI: −0.463 to −0.132) while the results in the severe dementia group were not statistically significant. Five studies measured the degree of agitation following completion of the intervention, and four studies showed effects at 3, 4, 6 and 8 months of follow-up."

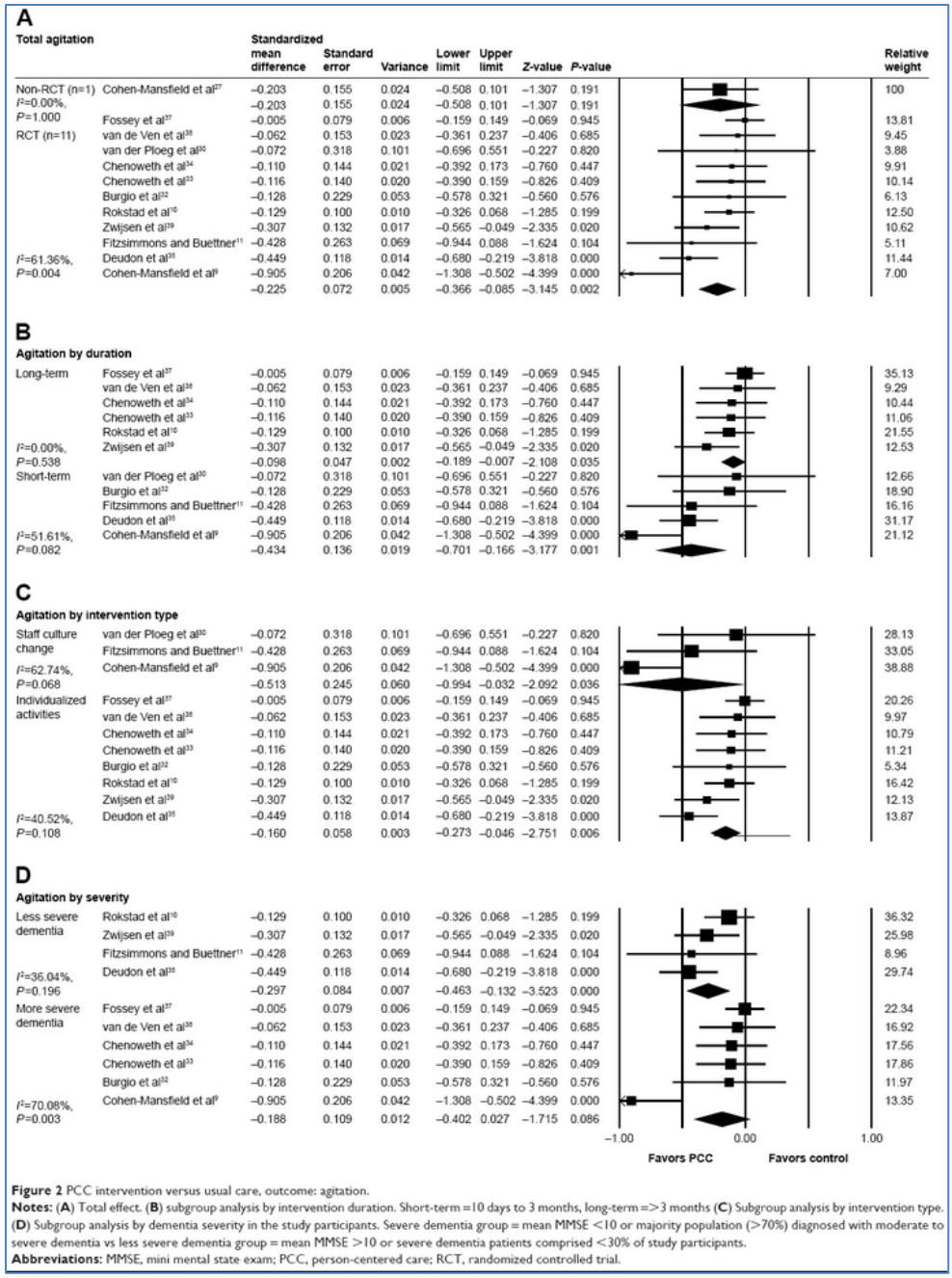


Figure 2 PCC intervention versus usual care, outcome: agitation.
Notes: (**A**) Total effect. (**B**) subgroup analysis by intervention duration. Short-term =10 days to 3 months, long-term =>3 months (**C**) Subgroup analysis by intervention type. (**D**) Subgroup analysis by dementia severity in the study participants. Severe dementia group = mean MMSE <10 or majority population (>70%) diagnosed with moderate to severe dementia vs less severe dementia group = mean MMSE >10 or severe dementia patients comprised <30% of study participants.
Abbreviations: MMSE, mini mental state exam; PCC, person-centered care; RCT, randomized controlled trial.

- "The meta-analysis confirmed the beneficial effect of PCC on reducing agitation in dementia. The findings of this study are supported by previous studies that have shown that people with dementia rarely exhibited agitation and other challenging behaviors when engaged in certain types of activities,40,41 including activities of personal interest.9,27 Therefore, it would seem logical that the benefits of therapy in dementia could be improved with the use of PCC approaches, which include personal preference and interests."
- "Meta-analysis identified that PCC interventions working directly with dementia patients had beneficial effects, reducing agitation and NPS, but the effects were mostly for a short term and lasted 6 weeks on average. The greater benefits of short-term

intervention may be linked to the increased engagement between the health care provider and the patient and the intensity of the care program."

Livingston, 2014a (23)

- AMSTAR: 63.64
- Intervention type: Sensory, psychological and behavioural interventions (activities, music therapy, sensory interventions, training caregivers, light therapy, home-like care, training carers, exercise, changing environment, dementia-specific therapies, pet therapy.
- Settings: care homes/hospitals, community and domestic interventions.
- Main Findings: Person Centered Care: "Efficacy: –1.8 to –0.3"; "There is convincing evidence that training paid caregivers in communication or person-centred care skills is effective for symptomatic and severe agitation, both immediately and up to 6 months, in the care home setting. There is preliminary evidence that it helps to prevent emergent agitation."

Travers, 2016 (11)

- AMSTAR: 72.73
- Settings: RACF/LTC/Nursing home/Permanent care
- Main Findings: Mixed findings
    - "Staff training using person centered care: "Agitation was assessed as the primary outcome measure in one study, and significant declines in CMAI scores in both intervention groups (PCC and DCM) compared to usual care were reported (PCC: mean decline ¼ 13.6, P ¼ 0.01; DCM: mean decline ¼ 10.9, P ¼ 0.04); importantly, the effect was maintained at four months follow-up, and it was concluded that PCC appears to be effective in reducing agitation in people with dementia living in RACFs.27 The two remaining studies also assessed agitation as one of several outcomes,29,30 although significant improvements on that measure were not found."
    - "Overall, these studies provide limited evidence that PCC or nursing care interventions aimed at developing individual care plans are effective for BPSD in people with dementia living in RACFs. The interventions implemented, however, differed in several key aspects, particularly the focus of the interventions. Unsurprisingly, the results of the study that focused on promoting physical activity showed a positive effect on physical function but not on measures of emotional or psychosocial functioning, 30 while the approach that focused on responding empathetically to residents resulted in improvements on some, but not all measures of emotional functioning.29 It is not known, however, whether these effects were maintained following cessation of the interventions. Finally, the implementation of PCC or similar interventions into real-world practice comes with a cost, which as Chenoweth et al.27 pointed out, is not inconsiderable. Importantly, their results indicated that PCC is equally as effective as DCM in reducing symptoms of agitation in people with dementia living in RACFs but costs substantially less, which would appeal to RACF managers and administrators."

Structured Activities

Summary

- Determined that there was insufficient primary research evidence to reach conclusion: Brasure, 2016

Brasure, 2016 (17)

- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: "Structured Activities: Insufficient"
    - *Summary conclusion only, structured activities appear to have been a comparator.*

Yokukansan

Summary

- Demonstrated effectiveness: Matsunaga, 2016

Matsunaga, 2016 (10)

- AMSTAR: 54.55
- Setting(s): nursing home, assisted living, or community settings
- Main Findings: Quantitative, effective
    - "In the subscale of BPSD subscale scores, yokukansan treatment was superior to control treatments with respect to … aggression/agitation subscale scores (SMD = –0.37, 95% CI = –0.60 to –0.15, p = 0.001, I2 = 0%, N= 5 studies, n = 311 patients; Supplementary Figure 2).
    - "When divided into "studies that included only subgroups of patients with Alzheimer's disease" and "studies that included several subgroups of patients with various types of dementia",yokukansan significantly decreased… aggression/agitation (SMD = –0.53, 95% CI = –0.90to –0.16, p = 0.005, I2 = 0%, N= 2 studies, n = 118patients; Supplementary Figure 2) … subscale scores compared to control treatments in the "studies that included several subgroups of patients with various types of dementia".
    - "However, compared with control treatments, yokukansan marginally decreased aggression/agitation subscale scores in the "studies that included only subgroups of patients with Alzheimer's disease" (SMD = –0.28, 95% CI = –0.56 to 0.01,p = 0.06, I2 = 0%, N= 3 studies, n = 193 patients; Supplementary Figure 2).