

Table of Included studies - Primary studies

| Author and year | Country | Study type | Study focus | Intervention | Duration & intensity | Delivered by | Setting | Sample size |
|-----------------|-----------|---------------------------------|---------------------|---|--|-----------------|-------------------------------|--|
| Anderson 2011 | Australia | within subject controlled study | Multisensory | Snoezelen room. 14 staff members received enhanced snoezelen training | 1x week for 6 weeks. Staff encouraged to continue each session for 20 minutes unless the resident appeared distressed. | Care home staff | Snoezelen room | 12 |
| Behrman 2014 | UK | Discussion paper | Multisensory | NA - discussion on senses in management of dementia | NA | NA | NA | NA |
| Belgrave 2009 | US | Before/after | Multisensory, Music | All groups received music therapy provided by a music therapist who sang and played the guitar. Two groups also received touch as part of the intervention (either expressive or instrumental touch). | 9x 30 min sessions each over 2 weeks (each condition 3 times each) | Music therapist | At bedside or in private room | 9 |
| Bergland 2015 | Norway | Qualitative | Environment | NA - looks at caregivers perceptions of mealtime agitation (for example impact of social interaction and stimuli) | NA | NA | Dining area | 21 |
| Burns 2011 | UK | RCT | Aromatherapy | Participants were allocated to 1 of 3 groups: placebo medication and active aromatherapy; active medication and placebo aromatherapy; or placebo of both. | 4 weeks | family carers | Not specified | 114 (81 completed the 12 wk assessment) |
| Cameron 2011 | UK | RCT | Aromatherapy | 2% lemon balm oil rubbed into the forearm for one minute twice a day. | 1 minute of massage 2 x day for 3 weeks. | Nurses | CH | 18 |
| Chenoweth 2009 | Australia | RCT | Other | 3 groups: person-centred care, dementia care mapping, or usual care. Carers received training and support in either intervention. | 4 months. Mapping was 6h per day for 2 days | Researchers | Around the CH. | 236 (of 289 recruited) residents were randomly assigned. (109 mapping group; 98 PCC group; 82 control) |

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|---|--------|---------------|-----------------------------------|--|---|---|--|-----------------------------------|
| Chu 2014 | Taiwan | RCT | Music | Music therapy which included gross & fine motor movements performed to music; rhythm playing along with music; listening to popular music; rhythm playing with instrumental accompaniment; and singing with instrumental accompaniment. | 12 sessions of group music therapy (two x 30-min sessions a week for 6 weeks) | Trained music therapist with experience in dementia | The recreation rooms of each facility. | 100 (49 intervention, 51 control) |
| Cohen-Mansfield 2011 | US | Observational | Environment, Multisensory, Music, | Twenty-five predetermined engagement stimuli were presented to participants over a three-week period (approximately 4 stimuli per day) categorised as; live human social stimuli, simulated social stimuli, inanimate social stimuli, reading stimulus, manipulative stimuli, a music stimulus, task and work-related stimuli, and two different personalized stimuli, based on the study participant's self-identity. | Engagement trials took place between 9:30 am – 12:30 pm and between 2 pm – 5:30 pm, approximately four activities each day for three weeks. (duration of each activity not stated). | Research assistants | Not stated, but description suggests a communal area | 193 |
| Cohen-Mansfield 2012 - same data set as Cohen-Mansfield 2011 | US | Observational | Environment | See Cohen-Mansfield 2011 | See Cohen-Mansfield 2011 | See Cohen-Mansfield 2011 | See Cohen-Mansfield 2011 | 193 |
| Cohen-Mansfield, 2012 (same data set as Cohen-Mansfield 2011) | US | Observational | Multisensory | Participants were presented with 25 predetermined stimuli. Categories as before | A three-week period (approximately 4 stimuli per day) between 9:30 - 12:30 pm and between 2 pm-5:30 pm | Researcher | Activity or dining room | 193 |

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|--|----|---------------|-------------------------------|---|---|-------------|---|---|
| Cohen-Mansfield, (2011) (same dataset as Cohen-Mansfield 2012) | US | Observational | Multisensory | Each participant was presented with 25 predetermined engagement stimuli in random order. Categories as before | 3 weeks, 4 stimuli per day. Between 9:30 -12:30 pm and between 2 pm-5:30 pm | Researcher | Activity or dining room | 193 |
| Cohen-Mansfield 2010 | US | Observational | Other | Same as 2011 and 2012 | Same as 2011 and 2012 | Researcher | Activity or dining room | 193 |
| Cohen-Mansfield 2016 | US | Observational | Environment, Other, Structure | Looks at unmet need within context of treatment arm of RCT. Identifies need for sensory stimulation and social interaction. | NA | NA | Around the care home | 89 |
| Cohen-Mansfield 2010 | US | Observational | Multisensory | See Cohen-Mansfield 2011 | See Cohen-Mansfield 2011 | Researchers | Nursing home specific space not described | 111 |
| Cohen Mansfield 2015 | US | Observational | Music, Other, Touch/massage | Non pharmacological interventions - includes sensory stimulation, social interventions (e.g. lifelike doll), music, outside activities and one to one with research assistant. RA collected data on persons needs and preferences from formal and informal caregivers and from direct observations. | 5 x week for 2 weeks. Amount and duration of interventions varied | Researcher | Not specified | 93 |
| Collier 2008 and collier 2010 | UK | RCT | Multisensory | Multisensory - aimed at stimulating all 5 senses. | 12 sessions, length not specified | Not clear | This activity was run in a quiet area, quiet room or purpose built MSE. | 30 (17 in intervention group and 13 in control) |

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| Cruz 2011 | Portugal | Before/after | Multisensory | Motor and multisensory stimulation strategies during residents' morning care routines by staff after the provision of group training and individualized assistance. This included things such as warm towels or gentle massage | Staff participants received eight 60-minute training sessions. | Care home staff who were trained by members of MDT | In residents own rooms (as part of washing, dressing etc) | 6 |
| Cruz 2013 | Portugal | Other | Multisensory | Multisensory and motor based group activity program. Used residents preferences and lifetime histories to frame sessions | 1 x week for 16 weeks. Each session about 45 minutes | Facilitators - physical therapist, gerontologist, activities coordinator | Quiet room with proper lighting and without extraneous stimuli (e.g TV from outside) | 4 |
| Fu 2013 | Australia | RCT | Aromatherapy, Touch/massage | 3 groups: Combination (aromatherapy and hand massage ; Aromatherapy ; Placebo control (water spray). Aromatherapy spray was used (allowing the potential confounding effect of massage to be controlled for). Given the likelihood that participants might have compromised olfactory systems a direct spray onto individuals' upper chest was used. | Twice daily at 2 time periods, 9-11 am and 2-4 pm, 7 days a week for 6 weeks. (Hand massages were for 2.5 minutes each hand). | Researchers | A quiet and private environment, such as the participant's room. | 61 (combination n = 19 ; aromatherapy n = 22 ; control n = 20) |
| Fujii 2008 | Japan | RCT | Aromatherapy | Lavendar aroma therapy. Two drops of lavandar oil applied to the waist band of the person's underwear | The intervention was given 3x day for 4 weeks | Not stated. | Long term care facility | 28 |

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| Gotell 2009 | Sweden | Observational | Music | 3 different options were tested: the “usual” caring routine (i.e., the control situation); a caring routine done with recorded music playing in the background (“back-ground music”); a caring routine in which the caregiver sang to and/or with the patient (“caregiver singing”). | The sessions occurred between 7 am and 9 am and lasted between 6 and 22 minutes. | Care home staff | In a bathroom | 14 (9 people with severe dementia & 5 professional caregivers) |
| Goto (2014) | US | Non randomised controlled | Environment/Multisensory | Snoezelen room OR an indoor Japanese garden | 15 minutes, 2x week (3 weeks for Snoezelen room, 4 weeks for Japanese garden) | Researcher | Japanese garden or Snoezelen room | 18 |
| Hammar, (2011) | Sweden | Observational | Music | MTC (music therapy caregiving) was implemented during morning care situations while PWD were being cared for. Involved caregivers singing songs. | In all, every PWD participated over a two-month period | Care home staff | Not specified | 10 |
| Harris 2012 | US | Other | Touch/massage | Slow stroke back massage (SSBM) done at night when resident was ready to go to sleep. SSBM is characterized by long, slow, gliding, repetitive strokes from the sacral to cervical regions of the spine | 3-minute SSBM at bedtime for two nights. | Researcher trained in SSBM | participants rooms | 40 |
| Hsu 2015 | UK | RCT | Music | 1:1 live interactive music therapy. Therapists used musical, vocal, bodily and facial expressions. After each session, two video clips were presented to the care staff participants in the intervention group unit, in order to communicate elements of music therapy to carers. | 1:1 MT once x week for 5 months. Each session was 30 minutes. On average people missed 5 sessions | Music therapist. Residents received sessions from the same music therapist throughout the project | Quiet room on the unit. | 17 care home residents and 10 care home staff |

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| John 2015 | UK | Qualitative | | | group sessions last an hour, one to one between 20 and 30 mins. Most have 3 sessions a week | Activity coordinators | Day room which has been developed into a sensory room. | |
| Kellett 2010 | Australia | Qualitative | Other | Qualitative evaluation of The FBW process which involved families and staff completing a set of exercises designed to help them build a biography of the life of the person with dementia. . | 6 x week, two-hour sessions | A researcher facilitated | NA qualitative sub-study | 14 |
| Kupeli 2016 | UK | Qualitative | Other | NA - realist study exploring quality of end of life care for providing good palliative care to people with advanced dementia in care homes | NA | NA | NA | 14 |
| Lancioni 2013 | Not clear | Non randomised controlled | Music | Sessions involved music stimulation (i.e. active and passive conditions) or no music stimulation. In the active condition, the patients used a simple hand response and a micro switch to self-regulate music stimulation inputs. In the passive condition, music stimulation was automatically presented throughout the sessions. | 3-7 x day, duration between 5-10 minutes. | Care home staff | A room of the residential center that the patient attended | 6 |
| Lape 2009 | US | NA | Environment, Multisensory | Snoezelen room- including fibre optics, mirrors and visual effects, a sound machine, tactile items, scented objects and a glider rocket. | 30-45 minutes sessions, 3 x week for 6 weeks. | Researcher | Snoezelen. 9'x9' room. | not reported |

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| Litchke 2014 | US | Qualitative | Multisensory, Touch/massage | Multisensory chair yoga program - included touch, visual modelling & auditory stimulation. A namaste greeting was used to provide a consistent end to each session and thank them for attending. | 2x week for 10 weeks, for 30-55 minutes. | Researcher who is a certified yoga instructor. 2 recreation therapy graduates assisted each session | Not stated | 26 |
| Lykkeslet 2014 | Norway | Qualitative | Multisensory | Qualitative evaluation of multisensory programme. Includes combination of sensory activities similar to Namaste. | Not clear | Care home staff | The dining room | not reported |
| Magee (2017). | Northern Ireland | Before/after | Multisensory | Namaste Care - Programme included welcome, hand massage, scent, touch to stimulate pleasant memories, music. Tailored to the needs of individual residents (biographical details obtained from family members). The facilitator (MM) held a training session for the staff and the carers to be involved with the programme prior to its commencement. | 2 hours of activities, 5 days a week for 4 weeks | MM (lead author and Palliative Care Nurse Specialist) ran the first session then the activity therapist delivered the rest with help from relatives. Two staff members were allocated to assist in the program | Residents lounge | 9 |
| Manzar 2015 | UK | Before/after | Other | | every day, 2 hrs before and 2 hrs after lunch | Care home staff | A specific room was selected and furnished in a style that was comfortable and familiar for the individuals. | 9 |

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| Mariko (2015) | Japan | RCT | Touch/massage | Touch therapy in which - touch was applied on the Shinchuu, (between T3 and T4 vertebrae). | 2x day (morning and afternoon) for 4 weeks, each instance lasted between two and three minutes. | Caregivers (not specified) | Not stated | 21 |
| Maseda 2014 | Spain | RCT | Multisensory | Smultisensory environment (snoezelen), individualised activities and control. Data on the participants' sensorial preferences and interests were collected to design the content of the sessions | 2 x week for 16 weeks. | All sessions were conducted by professionals (occupational therapist or psychologist) with equivalent education and training in the methodology used. | A multisensory environment (type of room or space not specified) | 30 |
| McDermott (2014) | UK | Qualitative | Music | Music therapy where clients were encouraged to explore musical instruments and/or their voice with the therapist. The method of facilitation and clinical intervention varied, and was determined by the clinical needs of each client and were shaped by the theoretical orientations and experiences of the music therapists. | NA (intervention varied) | Music therapists - all had a minimum of four years' experience of working with clients with dementia in residential settings. | Various | 53 |
| McNeil 2016 | US | Qualitative | | | | Care home staff | Specially designed NC room. | |
| Milev 2008 | Canada | RCT | Environment, Multisensory | Participants were brought to the snoezelen room and exposed to MSS through 1:1 interaction with facilitator. | 1-3 x week for 12 weeks. Each session lasted 30 minutes (or less) | Qualified Snoezelen facilitator | Snoezeln room | 18 |

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| Moyle 2014a (Moyle 2014b is the same study) | Australia | RCT | Touch/massage | Foot massage - light pressure with an unscented lubricant. In quiet presence assistant sat quietly at residents feet for 10 minutes without talking or making physical contact. | 10-min foot massage (intervention) or quiet presence (control), every weekday for 3 weeks. Massage group received an average of 12 massages, control group average of 14 QP sessions. | Research assistants who were trained massage therapists | Residents bedroom | 55 |
| Moyle 2014b (Moyle 2014a is primary study) | Australia | RCT | Touch/massage | See Moyle 2014a | See Moyle 2014a | Nursing students trained to deliver either foot massage or quiet presence interventions | Residents bedroom | 53 |
| Murphy (2017) | UK | Qualitative | Other | NA | NA | NA | NA | 50 (30 care staff, 8 family carers, 3 dieticians, 9 speech therapists) |
| Nair (2011) | Australia | observational with cross over | Music | Baroque music played in communal areas. Residents were free to wander in and out of their rooms during this time. | music intervention - music played for 4 weeks from 3 pm to 7 pm) | CD player in the common area, no person to person aspect to the intervention | communal area | 75 |
| Narme 2014 | France | RCT | Music | Music played on a CD. Excerpts covered a range of styles and were calming with slow or moderate tempo at the beginning and the end of the session with a higher tempo in the middle of the session. Participants asked to participate by singing or using percussion instrument. | One hour twice a week for 4 weeks. Total of 8 hours. Same play list in same order for every session. | Two facilitators. Neither had any prior education in music therapy | Not stated | intervention music group (n=18), control group (n=19). 48 were originally randomised but only 37 completed the intervention |

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| Nicholls 2013 | Australia | Qualitative | | High-touch intervention based on NS. Involved train the trainer package, family conferences and the NC programme | Not specified | Care home staff | Not clear | 31 - staff and family members. |
| Quell 2008 | Sweden | Non randomised controlled | Touch/massage | Tactile stimulation (TS) is a form of touch massage aimed at reaching the skin touch receptors. No background music was allowed and noise and interruptions kept to a minimum. TS generally applied to hands, arms, feet, or legs were the areas generally chosen. | a minimum of once a week for 28 weeks with each sequence lasting at least 20 minutes. | Care home staff who received theoretical as well as practical instruction in TS. . | Residents own rooms | 20 |
| Raglio 2015 | Italy | RCT | Music | Music therapy - during the session, the music therapist built a relationship with the PWD by singing and using melodic and rhythmic instruments (improvisation), facilitating the expression and modulation of the PWD's emotions and promoting "affect attunement" moments Listening to music - therapist created a playlist on basis of interviews with PWD | 20 sessions - either individualised music therapy or individualised listening to music. 30 minutes | Music therapist | Quiet medium-sized room | 120 |
| Raglio (2010). | Italy | RCT | Music | 1 experimental group (MT and standard care) & 1 control group (standard care only). | The experimental group received three cycles of 12 30min MT sessions each, three times a week. | Music therapists | Not reported | 51 (of 60 recruited) |

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| Rodriguez-Mansilla, (2015) | Spain | Other | Touch/massage | One group received ear acupressure and the other massage. | Duration and frequency of acupuncture not clear. The massage was applied on the lower limbs and back during 20 minutes, on a daily basis from Monday to Friday | The ear acupressure techniques were performed by a qualified acupuncturist . The massages were performed by a qualified physiotherapist | Not reported | 111 |
| Sakamoto (2012) | Japan | RCT | Aromatherapy | Lavender vs placebo. The lavender group received continuous olfactory stimulation from a lavender patch. The patch attached to the inside of the clothes near the neck, the odor is faint only the person wearing the patch can smell it. The placebo group received an unscented patch which looked identical. | All day, every day for 12 months. | Nursing home staff | Patch was attached to resident | N=145, intervention n=73, control n=72 |
| Sakamoto 2013 | Japan | RCT | Music | Compared a non-intervention Control group, a Passive music intervention group, and an Interactive music intervention group. | Each intervention was performed for 30 min 1 x week (10 sessions in total) | Music facilitators included two music therapists, four OTs, and six nurses with knowledge of severe dementia symptoms. All received training. | A familiar setting for resident | 39 |

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| Sanchez 2016 | Spain | RCT | Multisensory | 2 groups: MSSE (multisensory stimulation environment) and individualized music sessions. The MSSE group participated in multisensory sessions in a Snoezelen room | x2 30-min weekly sessions over 16 weeks | Professionals in the field of psychology or occupational therapy, with equivalent education and training in the methodology used. | MMSE Snoezelen; music sessions in a quiet room | 18 (9 each group) of 22 recruited |
| Simard 2010 | US | Before/after | Namaste Care | Involved: welcome, comfortable seating, pain monitoring, meaningful activities, snacks and drink, touch | 7 x week, for approx 5 hours a day. The number of residents in the program ranged from 6 to 11 | Namaste Carers (certified nursing assistants). | 4 facilities designated a room that was only used for Namaste Care and was decorated with soft colors and had a homey feeling. | 86 |
| Soliman 2015 | UK | Before/after | Namaste Care | Involved: welcome, comfortable seating, pain monitoring, meaningful activities, snacks and drink, touch | 3-5 sessions in each home each week. Some homes offered sessions of 90 minutes others 2 hrs | Care home staff | Namaste Care area (where residents can feel they are entering a special space) | 14 |
| Staal, (2007) | US | RCT | Multisensory | Randomized to receive either: multi-sensory behavior therapy (MSBT; one to one individualized sensory stimulation) or a standard structured activity session i.e. one to one attention using therapeutic recreation activities such as play dough. | 6 sessions 25- 30 minutes per session | Not clear | Not reported | 24 |

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| Stacpoole 2016 | UK | Other | Namaste Care | Involved: welcome, comfortable seating, pain monitoring, meaningful activities, snacks and drink, touch | 2x day, 7 days a week | Namate Care workers | Not clear - some homes had special NC space but others did not seem to | 37 enrolled (30 completed the study) |
| Strom 2017 | Ireland | RCT | Multisensory, Other | 3-groups (Sonas, reading, and control group). The Sonas programme is a multi-sensory stimulation programme. It involves cognitive, sensory, and social stimulation, including all 5 senses. The programme is a therapeutic activity for people who have significant communication impairment, primarily as a result of dementia. | Twice a week for 24-weeks. Each session lasted 45 mins. | A person trained in the Sonas programme (Sonas licensed practitioner) and an assistant. | Not reported | 105 of 120 recruited: Sonas group (n = 45), the reading group (n = 27) or the control group (n = 33) |
| Sung 2010 | Taiwan | Before/after | Music | The preferred music listening intervention was based on an individualized music protocol. The control group had usual care | 30 mins mid afternoon, 2x week for 6 weeks. The participants listened to their preferred music via CD players. | Trained nursing staff | A familiar setting | 52 (29 intervention & 23 control) |
| Sung 2012 | Taiwan | RCT | Music | Music intervention using percussion instruments with familiar music | 12 sessions of group music intervention over 6 weeks lasting for 30 minutes | Research assistants trained in music intervention | Residential care facility | 55 (27 in experimental group and 28 in control) |
| Suzuki 2010 | | Non randomised controlled | Touch/massage | The intervention was a Swedish complementary care method called tactile massage. | Participants received tactile massage 5 times a week for 6 weeks for a total of 30 times. Each session took place at 4-5pm and lasted approx. 30 minutes. | Ward nurses and collaborating nurse researchers who had participated in a 2 day training course | not specified | 40 (20 people in the intervention group and 20 people in the control group). |
| Tuckett 2015 | Australia | Qualitative | Music | Music therapy | 2x week for 12 weeks, 45-60 mins each | Music therapist | In the dementia-specific unit | 30 |

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| Van Vracem 2016 | Belgium | Qualitative | Multisensory, Other | NA: Created a framework with seven types of environmental interventions for agitation in dementia | NA | NA | NA expert panels | 27 |
| Vezina 2011 | Canada | Qualitative | Identity cues | NA - focuses on role of life story/biography | NA qualitative | NA qualitative | NA qualitative | 21 |
| Vink 2013 | The Netherland | RCT | Music | Residents participated in group interventions (music therapy or general activities) with a maximum of five residents. In music therapy condition, sessions started with a welcome song after which residents listened to music selected, sung or played by the therapist. If possible they actively participated in music activities. Therapist adjusted the level of each intervention to each individual's capacities. | Twice weekly for 4 months. All sessions were 40 minutes. (maximum of 34 sessions each resident / TOTAL: 235 music therapy and 180 general activities) | A music therapist with at least 5 years working experience. The recreational activities were provided by occupational therapists. | Both interventions were provided in separate rooms, away from the ward. | 77 residents (43 intervention and 34 control) |
| Ward-Smith 2009 | US | Restrospective study | Multisensory | Multisensory stimulation environments The interventions included in this study were: music, light, touch, message, and aromatherapies. | Each treatment is provided over a 15- to 20-minute period, between 1300 and 1600. A total of 84 MSE-based interventions were provided. | session coordinated by activity director | Multisensory simulation room (MSSR) | 14 (7 intervention, 7 control) |