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Young, Rhea, Camic, Paul M. and Tischler, V. (2015) The impact of community-based arts and health interventions on cognition in people with dementia: a systematic literature review. *Aging & Mental Health*. ISSN 1360-7863.

Link to official URL (if available):

<http://dx.doi.org/10.1080/13607863.2015.1011080>

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**The impact of community-based arts and health interventions on cognition in people with dementia: A systematic literature review**

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**Abstract**

**Objectives:** Dementia is a progressive condition, affecting increasing numbers of people, characterised by cognitive decline. The current systematic review aimed to evaluate research pertaining to the impact of arts and health interventions on cognition in people with dementia.

**Method:** A literature search was conducted utilizing PsychInfo, Cochrane Reviews, Web of Science, Medline and British Humanities Index databases. Seventeen studies were included in the review, including those related to literary, performing and visual arts.

**Results:** The review highlighted this as an emerging area of research with the literature consisting largely of small-scale studies with methodological limitations including lack of control groups and often poorly defined samples. All the studies suggested, however, that arts-based activities had a positive impact on cognitive processes, in particular on attention, stimulation of memories, enhanced communication and engagement with creative activities.

**Conclusion:** The existent literature suggests that arts activities are helpful interventions within dementia care. A consensus has yet to emerge, however, about the direction for future research including the challenge of measurement and the importance of methodological flexibility. It is suggested that further research address

some of these limitations by examining whether the impact of interventions vary depending on cognitive ability and to continue to assess how arts interventions can be of use across the stages of dementia.

Keywords: literary arts, visual arts, performing arts, dementia, cognition, wellbeing

## **Introduction**

This review aimed to assess current research relating to the impact of arts and health interventions on cognition in people with a dementia. Consideration has been given to the existent research pertaining to the psychological effects of such interventions and theories relating to the cognitive impact of art. Relevant empirical studies have been evaluated and the implications for practice and future research have been discussed.

### **Dementia and cognition**

Cognition, as defined in this review refers to a number of higher mental processes including perception, memory, language, problem solving, and abstract thinking (Gerrig & Zimbardo, 2002). One of the characteristics of dementia is an on-going and significant decline in this range of skills. Difficulties in communication and other cognitive processes can contribute not only to social isolation but also to challenging behaviours (e.g. wandering, aggression) (Allen-Burge, Stevens & Burgio, 1999).

Despite this decline in cognitive skills, to date, only one non-pharmacological intervention with a focus on cognitive symptoms, cognitive stimulation therapy, is routinely recommended (National Institute for Health and Clinical Excellence (NICE), 2012). There is an increasing body of research, however, into other non-pharmacological, psychosocial and community-based interventions and their impact on quality of life and wellbeing (Douglas, James & Ballard, 2004; Moniz-Cook, Vernooij-Dassen, Woods, Orrell & Interdem Network, 2011). One particular area where such research is emerging is the arts. A new national initiative in the United States, for example, has recently seen several government agencies make a substantial

commitment to jointly fund arts and health research (National Endowment for the Arts, 2013).

### **Arts and health**

Dating back to the 18<sup>th</sup> century, it has been widely believed that the arts had the potential to have positive effects morally, emotionally and spiritually (Carey, 2006).

More recently, recommendations have been made that arts interventions are a necessary part of health care provision and are considered to have benefits for health and wellbeing (Department of Health (UK), 2007). In 2014, after a two year consultation and evidence review, Australia became the first country to endorse an arts and health framework as part of national health care policy (Australian Government, 2014). The Arts Council England (ACE) has defined arts and health activities as those which aim to “improve individual and community health and healthcare delivery, and which enhance the healthcare environment by providing artwork or performances” (Arts Council England, 2007, p.5). ACE acknowledged that arts and health activities and those of the arts therapies have been historically distinctive from each other. Arts and health programmes have tended to be arts-focused and delivered by artists, educators, nurses and gallery/museum staff across community-based and healthcare settings, whereas arts therapies are delivered by qualified clinical therapists in healthcare settings and “occur within a therapeutic relationship” (Malchiodi, 2013, p. 6).

Basting and De Medeiros (National Endowment for the Arts, 2013) discussed systematic and integrative reviews involving dementia and music (e.g. passive listening to music, active drum circle participation), drama and participatory art-

making and found positive results which included some benefits to cognition, quality of life and a reduction in neuropsychiatric symptoms but generally faulted the studies for their weak study designs (p. 9).

Douglas et al. (2004) recommended arts-based interventions for people with dementia to provide meaningful stimulation, social interaction and improvements in self-esteem. Killick and Allan (1999) suggested that the arts allow those with dementia to express thoughts and feelings as well as enabling them to assert their individuality, suggesting that this is aligned with Kitwood's (1997) person-centred approach to dementia care..

### **Art, aesthetics and dementia**

Junker (2010) argued that art has played a decisive role in the evolution of humans through the way the organism shapes and communicates with its environment. For Junker, art is more than comprehending aesthetics or symbolism, although both are important, it is also a way to communicate. His argument is salient if we consider the possible impact of the arts on people with a dementia; he contends that art "promotes the exchange of concepts within a social group. It is thus a sort of language" (p. 175). Following this premise, for those with dementia the arts may act as a way to communicate without solely depending on cognitive abilities. A similar idea was previously introduced by Kahn-Denis (1997) who suggested that art allowed people with dementia to be creative and expressive and thereby, bypass some of their cognitive deficits

Leder, Belke, Oeberst and Augustin (2004) devised a model of aesthetic experiences of visual art that involved five cognitive stages (perceptual analysis,

memory integration, explicit classification, cognitive mastering and evaluation) alongside ongoing emotional evaluation. Their approach offered an integrative view of aesthetic appreciation that involves the role of meaning, interaction of cognitive and affective processes, wide-reaching ways in which art can be experienced and “the diversity of ways in which this information can be used, combined, associated” (Leder & Nadal, 2014, p. 447). This model and its recent revision (Leder & Nadal, 2014) suggests that when art is viewed for a longer period of time different perception-cognition-emotional interactions can occur, which in turn could have emotional and cognitive benefits. Although this model has not yet been tested with dementia, there are implications for its use in research to help understand aesthetic processing of visual art as well as implications for the design of dementia care arts programming.

In terms of memory specificity, Baddeley (1992) identified three subcomponents of working memory involving an attentional-controlling system holding executive functioning that coordinates information, “a visuospatial sketchpad relating to the processes of visual perception and action” (p. 559) and the phonological loop involving speech perception and production. Subsequently he added a fourth component, the episodic buffer (Baddeley, 2000) that provides a temporary interface between the phonological loop, the visuospatial sketchpad and episodic long-term memory. Baddeley rejected the concept of a single component system and replaced it with a system of multiple interacting subcomponents with an encoding strategy capable of parallel processing across the subcomponents simultaneously (Baddeley, 2010). The arts (e.g. art-viewing with discussion, singing and dancing, reading poetry) arguably combine these modalities, accounting for

improvements in working memory.

Fischer and Specht (1999) suggested that participation in artistic activity develops problem-solving skills, although this has not been considered widely in the literature. It has been suggested that the impact of art at a neural level can affect “development or maintenance of the interconnected neural systems that underlie different forms of cognitive processing” (Wilson & Bennett, 2003, p. 89). In terms of the literary arts, research has indicated that poetry can stimulate inner neural processing of language, thus having the potential to impact brain pathways related to emotion and memory function (Davis, Keidel, Gonzalez-Diaz, Martin & Thierry, 2012). Posner, Rothbart, Sheese and Kieras (2008) provided an explanation for the link between arts-based activities and cognitive improvement. Their theory posits that interest in the arts leads to motivation, which in turn leads to sustained attention; it is argued that improvements in attention lead to improvements in other cognitive processes. They suggested that attention-training exercises could lead to cognitive improvements, thereby concluding that arts training might have positive implications for other cognitive processes. Whilst encouraging, this theory suggests that a prior interest in the arts may be necessary for such cognitive improvements. Jonides (2008) similarly noted the importance of attention in exploring the impact of music and acting training on memory. He suggested that music and acting training leads to the development of rehearsal strategies, a component of sustained attention, which in turn leads to maintenance of memories which can then benefit other cognitive functions such as memory. Both this and the findings of Posner et al. (2008) were based on research conducted with younger people but provide a useful basis upon which to



consider the mechanisms by which participation in the arts may impact positively on cognition in other populations.

The aim of the present study was to undertake a systematic review in order to examine research regarding the impact of community-based arts and health interventions on cognitive processes in people with a dementia.

### **Methodology**

Search terms were based on those used in related research but expanded to include a focus on cognition and specific forms of art (Table 1). Searches were conducted of the following databases: PsychInfo, Cochrane Reviews, Web of Science, Medline and British Humanities Index; no date parameters were used. Google Scholar was also used and all relevant articles were hand searched for pertinent citations (Figure 1).

Table 1 here

Figure 1 here

Peer-reviewed research articles, written in English, which reported investigation of any type of cognitive impact from an arts-based intervention for those with dementia, were included. Arts-based activities included visual, performing and literary arts, as defined in previous arts and health review papers (Fraser & Sayah, 2011). Articles were excluded if they did not specifically consider the impact of the intervention on any cognitive process. Studies combining arts-based activities with other non-arts-based approaches, such as reminiscence or physical activity, were excluded due to the difficulty in attributing the results to art-related factors. For the purposes of this review community-based was defined as occurring in non-hospital or mental health outpatient settings (e.g. community centres, arts and cultural venues, day and residential care) facilitated by a range of staff that were not focused on the development of a professional therapeutic relationship such as occurs in the arts

therapies or mental health counselling (e.g. for a recent systematic review of art therapies and dementia care see Beard, 2012). Seventeen studies were included in the review, three of which related to literary arts (Table 2), seven to performing arts (Table 3) and seven to visual arts (Table 4). Studies were evaluated with consideration of Greenhalgh's (2010) criteria for critiquing research literature. Papers were therefore read with consideration of sample size, participant demographics including level/stage of dementia, location of intervention, method, measures and results.

Table 2 here

### **Literary Arts**

Holm, Lepp and Ringsberg (2004) evaluated a storytelling programme for people with severe Alzheimer's disease and their caregivers. The group was run by a nurse, trained as a teacher, who told stories relating to Erikson's developmental theory; she kept a reflective diary throughout which was analysed by the second author using qualitative content analysis. Storytelling was followed by a period of reflection and then an opportunity to discuss the story. The analysis revealed several themes, including stories awakening memories, storytelling generating involvement and curiosity and encouraging conversations about difficult topics. Although these results focus more on the social impact of the group, the themes indicate that cognitive processes such as memory retrieval and attention were activated.

Phillips et al. (2010) conducted a pilot study, which assessed the effect of 'TimeSlips', a storytelling programme, for participants with mild to moderate dementia. In the 'TimeSlips' groups, participants were shown photographs and

facilitators used prompts to encourage collaborative storytelling. Communication skills, cognitive functioning and quality of life measures were completed by nursing staff at baseline and two post intervention time points. The findings reported small to moderate increases in social communication and communication of basic needs at the first post intervention time point, declining four weeks later, indicating short-term benefits. The impact of the intervention on cognitive skills other than communication was not reported. However, reliability of nursing staff ratings with the communication measure was variable, with poor reliability reported for the basic needs subscale.

Billington, Carroll, Davis, Healey and Kinderman (2013) described the 'getting into reading' intervention. Reading groups varied in terms of duration of intervention and inclusion of participants with mental health problems, making it difficult to directly compare groups. Material was read aloud followed by open discussions. Neuropsychiatric Inventory Questionnaire (NPI-Q) scores were lower during the reading group (with lower scores indicating fewer psychiatric problems) than at baseline, and qualitative interview responses suggested that reading groups enhanced memory, listening and attention. The lack of a control group and variation in matching of intervention groups makes comparison and generalisation of results difficult. The study suggested, however, that reading groups could impact cognitive processes in those with dementia.

The papers discussed in this section focused on outcomes of storytelling and reading programmes. Holm, Lepp and Ringsberg's study (2004) involved telling stories to people with dementia and along with time for reflection and discussion. In contrast Phillips et al. (2010) encouraged participants themselves to tell stories and

Billington et al. (2013) read material aloud to participants. All of these studies were carried out in nursing home or day centre settings, in common areas or meeting rooms.

Table 3 here

### **Performing arts**

Few studies were located using the performing arts of dance, drama or music in community-based artistic activities that were not administered by trained therapists. There are various types of interventions that were used: caregiver singing, group singing, background and live music, participatory dance and dance performance.

Van der Vleuten, Visser and Meeuwesen (2012) assessed the impact of a live music performance on the quality of life of people with mild to severe dementia. Live music performances were conducted in small groups in which performers specifically attempted to initiate participation from audience members. Quality of life was assessed by caregiver-completed observational rating scales and reported to have good internal consistency on dimensions of participation and mental wellbeing. The authors concluded that live music performances increase communication, social contact and participation in people with mild dementia. It was suggested that this effect was not found for people with severe dementia due to their decreased cognitive capabilities.

Sherratt, Thornton and Hatton (2004) similarly investigated the impact of live music in comparison with recorded music and usual care, in a repeated measures design for those with moderate to severe dementia. The study found that the live music condition produced significantly more engagement, arguably representing the cognitive process of maintaining attention. Continuous time sampling using Dementia Care Mapping (Brooker, 2010) was used to code observations. Good inter-rater

reliability was reported in regard to sampling codes, although specific statistics were not provided, with any codes having low reliability excluded. Authors found levels of engagement were related to cognitive ability with participants who scored lower on the MMSE spending more time asleep or not engaged in meaningful activity.

Davidson and Fedele (2011) reported results of two singing programmes for people with dementia and their carers. The 6-week singing programme sessions were video-recorded and evaluated using standardised measures and specifically designed measures completed by carers and the group facilitator, with the latter measures suggesting positive improvements in social interaction and memory. The standardised hierarchic dementia scale (HDS), used to assess changes in cognitive functioning over the course of the intervention, did not reveal significant change over time and the authors concluded that the scale might not have picked up subtle changes initiated by such a short-term intervention. Participants with dementia rated their experiences of singing on a 5-point Likert scale and observational data was obtained from the group facilitator and carers. Pre post carer ratings suggested that improvements in short-term memory occurred for nearly one third. An analysis of video footage found that 67 per cent of participants 'usually' kept attention focused on the activity for the whole session.

Camic, Williams and Meeten (2011) evaluated a singing group run for people with dementia and family carers over a 10-week period. Various aspects of quality of life were measured including engagement and cognitive status at pre, post and 10 week follow up, using standardised measures and semi-structured interviews with carers and people with dementia. Seven people with dementia and 8 carers completed all measures at each time point. MMSE scores varied, with some increasing while others decreased. However, engagement was reported to be very high, with each

participant's behaviour observed for five, 30-second periods throughout each session, suggesting the activity was enjoyable and maintained participant attention. This study raised an important issue regarding the nature of dementia as a process of decline and the difficulty this causes in terms of measuring intervention outcomes. Type of dementia, medication status as well as scores on the NPI-Q (scores ranged from 0 to 33 out a possible 144) indicated low levels of behavioural and psychological problems. During interviews, both carers and those with dementia commented on the benefits of new learning during the groups, suggesting cognitive stimulation from the activity. This was the first study where a follow-up period of ten weeks had been reported in an arts-based programme.

Research has also examined the influence of other performing arts on cognitive abilities. Lepp, Ringsberg, Holm & Sellersjo, (2003) investigated the impact of two group interventions in people with dementia and their paid carers in Sweden. People with dementia were allocated to one of two groups, rhythm and songs or storytelling. Ten 90-minute weekly sessions were conducted for each condition. Data was collected from a single focus group, one month post-intervention, involving carers from both intervention groups, so it was not possible to compare groups. The one-month time gap may have allowed time for effects of the programme to emerge, although it may mean that some carers did not recall some of the minor changes that the groups may have initiated. Analysis of qualitative data, using principles of phenomenography (Svensson, 1997), revealed two categories, interaction and professional growth. The interaction category included subcategories of greater communication and reactivated memory, suggesting that the intervention positively impacted the caregiver's relationship with the person with dementia,

increasing communication between them. Caregivers also reported that the intervention led to a re-activation of the memories of the people they support. Due to the multi-modal nature of the interventions it is difficult to attribute changes to any one component. Although it was stated that data were analysed using principles of phenomenography, the process of analysis was not elaborated upon, making it difficult to assess usefulness, validity and transparency (Yardley, 2000).

In the most rigorous study to date, Finnish researchers (Särkämö et al., 2014) conducted a randomized controlled trial to explore a novel music coaching intervention in dementia/carer dyads. Dyads were randomized to either a 10-week singing coaching group, 10-week music listening coaching group, or a usual care control group usually consisting of activities such as reading and crafts. Neuropsychological assessment and quality of life measures were administered pre and post intervention and at 6 month follow up. ANOVA and ANCOVA were used to analyze the results; differences between groups at baseline were controlled. Results indicated that those in the singing and listening coaching groups experienced significant improvements in mood, orientation, episodic memory, attention, executive function and general cognition. The singing group was also shown to enhance short-term and working memory, which suggests that group singing and listening can have a sustained positive impact on a range of cognitive skills in people with mild to moderate dementia.

Only one study involving dance met the inclusion criteria. Ravelin, Isola, and Kylmä (2011) examined a dance performance and dance participation programme across different stages of dementia. Involving students across a range of ages from a local dance school, people with dementia living in a residential care facility were encouraged to reminisce about the different seasons of the year. Dance students

recorded these reminiscences and choreographed dances in response to them across four seasons. During their performances those with dementia were “discreetly touched by the dance students” (p. 11) and encouraged to hold hands and move with the dancers. The authors reported that the experience “awoke various emotions in the older persons. The emotional experiences were closely associated with memories of personal emotions and the self”(p.16). What was particularly noteworthy about this study was the lack of reminiscing about the initial reminiscence group during the interviews. Instead, participants spoke of generational and personal memories evoked by dancing and watching the dancers.

The above studies, conducted in community centres, day and residential care services, depict a variety of interventions including live music with participation, recorded music, group singing, and rhythm and songs interventions including the use of props and music to cue reminiscence and dance performances and participation. One study, a three-way RCT, provided significant evidence to support singing and music listening as having impact on the cognitive status in those with early stage dementia.

Table 4 here

## **Visual art**

Seven studies reported results from visual art programmes including art-making, art-education and art-viewing. The majority of these did not aim to specifically focus on the impact of the intervention on cognition, however, several reported improvements in specific cognitive processes.

Rentz (2002) and Kinney and Rentz (2005) described the impact of an art-making programme, ‘Memories in the Making’; Rentz reported on the impact of a



single session, whereas Kinney and Rentz (2005)'s study was over five sessions. The programmes were facilitated by an artist who was trained in working with dementia. The studies measured the impact of these sessions on overall wellbeing, considering the measure of sustained attention. Rentz (2002) conducted the programme over several sites and asked staff to evaluate one participant each for one hour and to rate 12 indicators of wellbeing. The author reported that 83 per cent sustained attention for 30-45 minutes, a result that can be difficult to achieve for someone with dementia. As a pilot study there were several methodological limitations including lack of a control group, measurements only being taken in one session, and therefore missing an opportunity to examine variation between sessions, and the use of multiple raters without consideration of inter-rater reliability.

Kinney and Rentz (2005) sought to account for some of the methodological difficulties with the above pilot study. The authors observed people participating in the art programme as well as in other 'traditional day centre activities' such as crafts. The Greater Cincinnati Chapter Well-Being Observation Tool was revised and rated by trained observers and adequate inter-rater reliability was reported (Cohen's kappa = 0.65). The validity of this measure was not reported. In terms of attention, the observation tool was used to rate whether an individual had sustained attention for 10 minutes, whether they required verbal prompting during the activity and whether they engaged in conversation and were then able to resume focus on the activity. The study found that sustained attention was higher when participants were engaged in the art programme than when engaged in other 'traditional day centre activities'.

However, observations of the 'other activity' always took place immediately following

the 'Memories in the Making' programme, making it possible that participants became fatigued, accounting for the drop in sustained attention. Despite the methodological limitations, these results are interesting to consider in light of the suggestion from Posner et al. (2008) that sustained attention can lead to improvement in other domains of cognition.

Ullan et al. (2013) presented an exploratory qualitative study in which participants with dementia took part in five artistic education workshops which involved an educational aspect as well as art production. People were observed by two of the authors who completed field logs and summary forms relating to each participant, recording information such as a rating of participant attention, whether they completed the work and whether they enjoyed the workshop. Following completion of the programme focus groups were carried out with the participants, carers, two educators who conducted the groups and an observer. The methodology used to analyse focus group and participant observation data was not indicated. Observations suggested that participants were interested and committed to the activity, arguably an indication of sustained attention as discussed in other studies. There were also suggestions that communication, with participants spontaneously initiating conversation about various topics, improved. Without a control group or pre-post measures, and without a description of the method used to analyze the data, it is not possible to adequately assess the study's findings. The results indicate limited support for the benefits of artistic education on cognitive skills in those with dementia, and this while encouraging, needs further exploration.

Musella et al. (2009) similarly investigated the impact of a five-week visual art intervention on psychological health and communication in people with

Alzheimer's disease. Eight paintings were presented to participants in each session.

MMSE and neuropsychological tests were administered to participants and psychological health was assessed under the Profile of Mood States at baseline and after an unspecified 'series of meetings'. Semi-structured interviews with caregivers were also completed. Results suggested improvements in verbal communication and attention occurred in nine participants. It was similarly reported that caregivers rated participants as more alert and communicative after each session. Lack of information about specific neuropsychological measures and how caregivers were interviewed makes the results difficult to evaluate..

MacPherson et al. (2009) reported findings from a six-week art gallery based programme of art-viewing for people with early to mid-stage dementia. People with dementia from the community and from residential care attended weekly sessions. Sessions were filmed and time sampling methods were used to assess individual level of engagement, revealing a high level of participant engagement throughout sessions. Qualitative data, analysed using grounded theory, was also provided from focus groups conducted with participants, carers and facilitators. Transcripts were analysed by two independent raters and a 'high level of agreement' was recorded, although how inter-rater agreement was achieved was not reported. The authors noted that all themes included in the results were expressed by two or more participants. The qualitative component of this study noted the impact of the intervention on memory. Carers in attendance reported partners recalling art, which had been viewed in previous sessions, on subsequent gallery visits. Educators who were involved in running the session similarly reported evidence of frequent 'memory stimulation',

including recognition of aspects of the programme itself such as previous art discussions and specific artworks. It was also reported that sessions were intellectually stimulating and people felt a sense of achievement. However, memory stimulation appeared context dependent, occurring specifically within the art gallery.

Eekelaar, Camic and Springham (2012) undertook an exploratory study in order to determine if an art gallery-based intervention had an impact on verbal fluency and episodic memory. The study consisted of pairings of people with early to mid-stage dementia and their family carers and presented a novel way of measuring verbal fluency and episodic memory through audio recording sessions during two activities, avoiding some of the drawbacks of using standardised measures with dementia. Results indicate that episodic memory improved from pre-intervention to end of intervention and that this increase was maintained at one-month follow-up. Verbal fluency was measured by coding for both semantic clustering and disfluencies. Semantic clustering, a measure of verbal fluency, was seen to increase from pre-intervention to intervention in the gallery, but this frequency dropped post intervention, suggesting the effects were not maintained long-term. Disfluencies were seen to decrease during gallery sessions but were seen to rise post-intervention. Combining these variables, the authors cautiously reported an overall improvement in verbal fluency and this was further supported in the qualitative aspect of the study involving family carer observations. Family carer interviews, when thematically analysed, supported an increase in memory recall and increased verbalisation. Notable limitations included inconsistency of attendance (only two pairings attended all three sessions), combined art-viewing and art-making making it not possible to evaluate the two components separately and the possibility of carry over effects due to the sequential nature of the intervention.

Camic, Tischler and Pearman (2014) in a mixed-method study compared the impact of eight week art gallery-based interventions, in two art galleries, one contemporary and the other a traditional gallery, on people with mild to moderate dementia and their carers. The intervention included both art-viewing and art-making and was facilitated by art educator/artists. Although this study did not specifically measure cognitive impact, thematic analysis revealed that both carers and dementia participants, across both types of galleries, reported improvements in cognitive capacities for those with dementia, including engagement, new learning and memory. The qualitative aspect of the study analysed only those themes that were identified by all participants, thus increasing validity (Braun & Clarke, 2006) but potentially omitting nuances. Limitations included the possibility that a proportion of participants also noticed further cognitive benefits, or declines, which were not reported. Despite the small sample size and lack of control group, this study provided limited support that the impact of such interventions may not be dependent on specific genres of visual art or on specific art-viewing or art-making environments.

The visual art interventions reported above involved art-viewing, art-making and combinations of both across a range of dementia severity. The art-making made use of various materials including paper and fabric during painting, drawing, collage making and printing, and in all cases was guided by art facilitators or educators and occurred in galleries, community centres and arts organisations. Art-viewing took place in art gallery settings and community centres using both original works of art and good quality reproductions.

## **Discussion**

All the studies included in this review indicated that the interventions had some form of positive effects in areas of cognitive functioning. Results across studies assessing

the impact of literary arts, suggest an impact on listening skills and communication of basic needs as well as communication about difficult topics. The studies which involved reading or telling stories also reported enhancement of memory recall. The literature on performing arts examined musical interventions such as group singing, rhythm and song and live music. With the exception of the encouraging results from a RCT (Särkämö et al., 2014), the other studies were smaller in scale with limited sample sizes. Data suggested that live music increased engagement and communication (Sherratt et al., 2004; Van der Vleuten et al., 2012). Group singing interventions were also found to promote new learning and short-term memory (Lepp et al., 2003; Davidson & Fedele, 2011; Camic et al., 2011) and rhythm and song, reactivation of memory (Lepp et al., 2003). Art-making was found to elicit sustained attention and communication about the artwork as well as other topics (e.g. personal interests, family, travel). Art-viewing led to increases in verbal communication, attention and memory stimulation. Studies in which art-viewing and art-making were combined found similar impacts on memory and communication, namely verbal fluency. Visual art was also found to prompt new learning and intellectual stimulation. It is possible that intellectual stimulation was the result of complex discussions and sustained engagement which occurred during art-viewing.

With notable exceptions, the studies in this review were mostly smaller scale exploratory or pilot studies, illuminating the early stage of research development in this area. Most of the quantitative studies did not use a control group nor provided longitudinal data. A variety of standardised measures were used, which might be expected considering the range of studies, but what is unfortunate, regardless of methodology, was the overall lack of consistency in reporting cognitive functioning (e.g. MMSE) or specific dementia diagnosis. Some qualitative studies did not provide

sufficient detail about how the analysis was conducted, limiting their validity, while others were more rigorous making their findings more useful for practice and future research. The lack of an identified theoretical framework for arts interventions is a further limitation. It may be unlikely, however, that one theoretical perspective can address all art forms. For example, Leder et al. (2004) and Leder & Nadal's (2014) theory of the "aesthetic episode", which pertains to visual art, shows a good deal of promise and needs to be explored within a dementia context. Clearly, additional development of measurement tools, theoretical underpinnings and refinement of arts-based interventions would further advance research in these areas.

In line with the findings of this review, Noice, Noice and Kramer (2013) noted the paucity of quality research in this area, noting the difficulty in combining epistemologically different standpoints, although the studies employing mixed methodologies arguably sought to address this by combining qualitative and quantitative data. In the United States, the National Endowment for the Arts (2013) reported common deficiencies in arts intervention research to include: deficient samples, lack of control groups, poor intervention documentation, lack of consistent measurement tools and overstated conclusions. Excepting overstated conclusions, this was found to be consistent with much of the literature included in this review.

This review supports the positive impact of literary, performance and visual art on cognition for people with dementia. While firm comparisons between these types of interventions cannot yet be drawn, the following tentative observations are offered:

1. Literary arts have been shown to have a positive social impact on people with dementia, in particular on communication and encouraging discussion.

They have also demonstrated enhanced cognitive processes such as memory retrieval and attention; enhanced memory, listening and concentration.

2. In terms of performing arts, live music performances have demonstrated improved mental wellbeing through increased communication, social contact and active participation in those with early stage dementia. Singing has been found to produce increases in sustaining attention for those with mild, moderate or severe dementia, although those with greater impairment need more stimulation. Singing coaching groups for those with mild dementia led to improvements in episodic memory, executive function and general cognition as well as short term and working memory; this has been seen as the most robust finding to date.

3. In terms of visual arts interventions, viewing and discussing visual art has been shown to lead to increases in sustained attention for those with mild to moderate dementia as well as being intellectually engaging through stimulating memory and communication. Viewing visual art followed by making art has been shown to improve episodic memory in early and moderate dementia, and to increase verbalisation during interventions. It also leads to sustained engagement in activities and encourages spontaneous communication.

4. The context of the site of delivery is an important consideration. A welcoming environment where participants feel valued may contribute significantly to how participants respond.

### **Implications for future research and practice**

Although there are methodological limitations, the literature presents a series of findings suggesting wide ranging psychological and social benefits for this group



thus warranting future research in this area. Of particular note is that these interventions were not conducted in clinical settings and provided easily accessible and arguably lower cost interventions that involved both people with dementia and their caregivers. Future research should continue to examine the impact of literary, performance and visual art interventions on cognition in those with dementia in a variety of community settings, with the aim of addressing some of the methodological concerns raised in this review.

The majority of studies discussed included only people with mild to moderate dementia. A consideration of whether the impact of interventions varies depending on an individual's cognitive ability would be important for future research to address.

It would also be useful for further research to continue to assess whether these interventions can be of use for people in the later stages of dementia. Van der Vleuten et al. (2012) found differences in outcomes for those with mild as compared to severe dementia, highlighting further the need for this to be a consideration. Similarly, only Camic et al., (2011) and Särkämö et al., (2014) reported information regarding medication use. This is an important consideration, as medication, particularly that prescribed for dementia, can impact cognitive functioning.

Few of the examined studies specifically set out to measure the impact of the identified intervention on cognition and many reported primarily qualitative data from staff or observers or data from standardised measures which may not have been specific enough to pick up subtle changes. Although qualitative data provides in-depth and detailed data about the nuances of any changes that have been experienced, it would be important for future research to consider other ways of measuring cognitive changes to be used in conjunction with qualitative data collection. The move towards this is evidenced in Eekelaar et al. (2012) who attempted to measure

changes in specific areas of language and memory using quantitative content analysis. Camic et al. (2013) acknowledged the difficulty of evaluating arts-based interventions for this client group in a way that could be sensitive to subtle but important changes. They recommended future research further consider the use of video or audio analysis of sessions as used in Eekelaar et al. (2012) in order to capture nuanced and subtle changes.

One aspect of cognition that was not addressed, with the exception of Eekelaar et al. (2012), was the specific cognitive components that make up language. This is arguably an important aspect of cognition to consider given that it impacts directly on ability to socialize and is a key factor in challenging behaviour, which is often displayed as a result of an absence of other effective means of communication (Allen-Burge et al., 1999). Although all studies suggested various benefits achieved from arts-based activities, they did not provide consistent information regarding the frequency and intensity of the intervention nor did most studies examine the effects of such interventions over a longer time frame. Future research could usefully examine longer-term impacts of such interventions on people with dementia, including, establishing the persistence of such changes following the end of an intervention.

### **Conclusion**

The present review evaluated the literature pertaining to the impact of arts-based interventions on cognitive processes for those with dementia. With cognitive decline being the main marker of dementia, the review highlighted a considerable gap in research which could be addressed in future studies. The review has confirmed the difficulty in combining art and creative approaches with strict methodological criteria and suggested the importance of methodological flexibility in order to better capture the complexity of community-based arts interventions. In addition to methodological

flexibility, larger scale studies including longitudinal and controlled designs are warranted. All studies reviewed here, do however, suggest that community-based arts interventions can have a positive impact on cognitive processes, particularly attention, memory and cognitive engagement. The observations of such effects necessitate further research in this area to build methodological rigor (Moniz-Cook et al, 2011), enabling firmer conclusions to be made about the mechanisms underlying such change.

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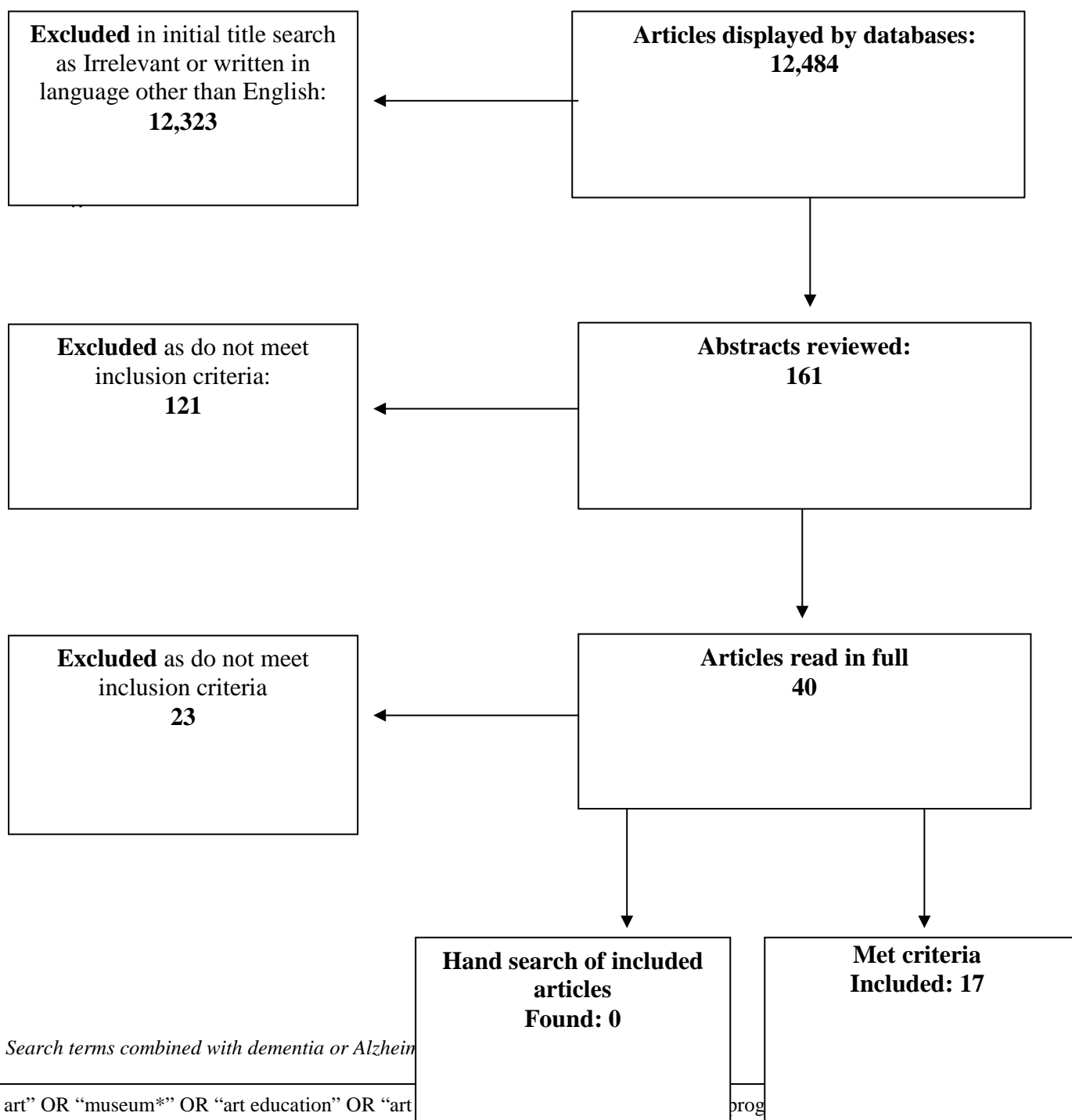
**Figure 1. Flow chart depicting literature search**

Table 1. Search terms combined with dementia or Alzheimer

“view* art” OR “museum*” OR “art education” OR “art “community art”	prog
“Cogniti*” OR “Communication” OR “language” OR “comprehension” OR “Memory” OR “problem solving” OR “perception” OR “abstract thinking”	
“Music” OR “sing*” OR “group sing*” OR “community music” OR “drama” OR “theatre” OR “poetry” OR “creative writing” OR “dance” OR “fine art” OR “decorative art” OR “literary art” OR “literature” OR “perform* art”	

Table 2. *Study summaries: literary art*

Author/Date	Sample Details	Intervention	Method	Measures
Billington et al. (2013) UK	61 PWD (all had a diagnosis of dementia although stages of dementia varied), 20 staff members	Individuals were observed in three reading groups conducted in different settings over 12 to 18 weeks.	Mixed-method, repeated measures design with thematic analysis of interviews	Neurological Inventory (NPI-Q), structured interview
Holm et al. (2004)	6 PWD (with severe	A 6 week storytelling	A qualitative study	Facilitator

Sweden	Alzheimer's disease), 3 paid caregivers	programme.	involving content analysis of facilitator diary.	diary
Phillips et al. (2010) USA	N = 56 (with a diagnosis of dementia and an MMSE score of $\geq 11$ but $< 24$ , mild to moderate dementia), (28 intervention and 28 control group)	A storytelling intervention conducted twice weekly for 6 weeks when compared with a usual care control group.	A quasi-experimental, repeated measures design in which quantitative measures were completed by nursing staff at baseline and two post intervention time points.	Function of communication (FACS) Scale for Dementia Neuropsychological Inventory Home Visitation of Life - Disease Observations Rating

Table 3. Study summaries: performing arts

Author/Date	Sample Details	Intervention	Method	Measures
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Lepp et al. (2003) Sweden	12 PWD (moderate to severe), 7 caregivers	Two group interventions. The first was led by a drama teacher involving rhythm and songs appropriate to participant's age. The other was led by a teacher trained in storytelling and focused on stories influenced by Erikson's theory of the life cycle.	A qualitative study involving focus groups run with carers from both groups one month post completion of intervention. Data analysed using principles of Phenomenography.	Focus g with car
Sheratt et al. (2004) UK	24 PWD (moderate to severe)	Investigated impact of live music PWD. Each participant was observed over four conditions; no music, taped music, taped music played by musician and live music.	A within-participants, repeated measures design was employed using mixed methodologies. Continuous time sampling and direct observation methodology was used. Inter-observer reliability of continuous time sampling codes was calculated using Cohen's kappa.	Continu samplin dement codes,
Davidson et al. (2011) Australia	30 PWD (mild to moderate), 18 caregivers (family and paid)	Two 6-week singing programmes for people with dementia and carers.	Obtained quantitative data from standardized measures and specially designed questionnaires completed by caregivers and ratings from PWD taken at pre and post time points. Qualitative analysis of video footage was also conducted and frequencies of observed behaviour were reported.	Hierarc scale (H Life – A Disease specific measur footage and car checklis
Camie et al. (2011) UK	10 PWD (with diagnoses of Alzheimer's, vascular dementia, mixed dementia: MMSE 5 – 28, M = 19), 10 family carers	A singing group for PWD and carers over 10 weeks.	A mixed methods, repeated measures design using standardized measures and interviews at pre, post and 10 week follow up. Interview data analysed using thematic analysis.	Semi-st interview Addenb Examin MMSE, Quality QoL-4), Depres (GDS),

				Neuro Invento Activitie Scale (I Special observa
Ravelin et al. (2011) Finland	13 PWD (mild to severe), 4 family carers, 7 nurses, 3 nursing students	Four dance performances were conducted in one nursing home, based on participants' reminiscence of the four seasons.	A qualitative descriptive study analysed using inductive qualitative content analysis.	Intervie family c and nur observa recordin during s
Van der Vleuten et al. (2013) The Netherlands	45 PWD (mild to severe)	Assessed the impact of live music performances by professional singers on quality of life in PWD.	Quasi-experimental design, using observational rating scales completed by caregivers.	Observ (author
Särkämö et al. (2014) Finland	89 PWD (mild to moderate, clinical dementia rating scale score 0.5-2) 89 caregivers	A musical coaching intervention. Dyads of carers and PWD were randomised to one of three 10 week groups; singing coaching groups, listening group and usual care control.	RCT with measures administered pre, post and at 6 month follow up.	Autobio fluency Cornell Quality Demen Genera Questio Quality Alzheim (QOL-A Intervie compre neurops battery

Table 4. *Study summaries: visual art*

Author/Date	Sample Details	Intervention	Method	Measur
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Rentz (2002) USA	41 PWD (severity undisclosed)	'Memories in the making' art-making project for PWD who were encouraged to use paints to create images on paper and fabric.	Quantitative study using staff completed rating scales based on observations of PWD during art sessions. Staff evaluated one participant for one hour rating on 12 indicators of wellbeing on a 4-point Likert scale, devised by authors.	Author's measurement declaration in Likert objective indicators engaged expressed self-esteem and feedback
Kinney and Rentz (2005) USA	12 PWD (diagnoses of probable Alzheimer's disease, vascular dementia, alcohol-related dementia, and confusion)	'Memories in the making' art-making project	Quasi-experimental study employing repeated measures, using paired sample T-tests, to observe wellbeing of PWD taking part in art project and other day centre activities. Observation tool with adequate inter-rater reliability was used to rate sustained attention and other variables at 10-minute intervals.	Greater Chapter Observations
MacPherson et al. (2009) Australia	15 PWD (mild to severe dementia, CDR: 56 – 93, community M = 70.8, residential M = 86.6)	6-week art gallery intervention for people with dementia involving discussion of artwork.	A mixed methodology using continuous time sampling. Qualitative data was also provided from focus groups conducted with participants, carers and facilitators and analysed using grounded theory.	Time sampling groups, Dementia (CDR)
Musella et al. (2009) Italy	10 PWD (mild to moderate Alzheimer's disease).	A 5-week visual art programme for people with dementia.	Mixed methods with a series of measures and interviews completed, although the approach used to analyse these was not reported.	Mini mental examining unspecified neuropsychological measures structure with carers
Eekelaar et al. (2012) UK	6 PWD (mild to moderate, MMSE: 18 – 24, M = 21.6) and 6 family carers.	90-minute sessions over 3 weeks which involved sequentially viewing and making art in an art gallery setting.	Mixed methods design, intervention sessions were audio recorded, transcribed and analysed using quantitative content analysis. Interviews were carried out with participants and carers pre and post intervention and analysed using thematic analysis.	Audio recording session with PWD



Camic et al. (2013) UK	12 PWD (mild to moderate, MMSE: 10 – 24, M = 20.1) and 12 caregivers	Two 8-week art gallery based interventions, one conducted in a traditional art gallery and one in a contemporary art gallery setting.	Mixed methods study quasi-experimental design. Pre and post standardised measures for PWD administered and analysed using parametric and non-parametric tests; qualitative interviews analysed using thematic analysis.	Dement Life (DE question and car Interview Bristol A Living s (PWD), interview and car
Ullan et al. (2013) Spain	21 PWD (mild to moderate, MMSE 12-27, M=19)	5 artistic workshops for people with dementia, containing an educational element as well as art production.	Participant observation in the form of a field record was conducted to assess engagement. Percentages of sustained interest and attention were calculated. Following 5 workshops, focus groups was carried out with PWD, and separately with their professional carers, method of analysis of these was not reported.	Particip assessm educato with PW