

A systematic review of the wellbeing outcomes of music and singing in adults and the processes by which wellbeing outcomes are achieved.



music, singing and wellbeing

for adults living with
dementia

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what works
wellbeing

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Executive Summary

Introduction

This is the third of three reports that form the review of self-reported subjective wellbeing outcomes of music and singing for adults and it consists of five intervention studies of participants with dementia as well as one qualitative study.

We have not included clinical studies of music and singing, including interventions for patients in hospital, studies where the focus is on clinical outcomes or dementia symptom management. Studies were only included in this review where the primary or secondary study outcome related to wellbeing i.e. measured quality of life, life satisfaction, anxiety, depression and was self-reported by the person with dementia.

Studies based upon proxy measures of wellbeing provided by carers, professionals or researchers were explicitly excluded to ensure comparability with our two previous reports.

Given the paucity of studies evaluating music and singing interventions to promote the subjective wellbeing of people with dementia, we have included those with a historical comparator (HC) as well as those with a concurrent comparator (CC) or qualitative studies where it would not be expected to include a comparator.

The methods of data extraction, quality appraisal for the studies reported here are the same as for the H1 and H2 studies and detailed in Volumes 1.

Scope of the included papers

The review encompasses data from 249 participants in quantitative and qualitative studies from 4 countries: Australia, Canada, Finland, France, and the United Kingdom. It encompasses interventions focussing upon singing or listening to music. Three key domains of wellbeing are reported; quality of life, depression and anxiety.

The studies included 3 randomised controlled trials (Särkämö et al., 2013; Cooke et al., 2010a, 2010b; Geurtin et al., 2009), two observational studies (Clements-Cortes, 2013; Camic et al., 2011), and a qualitative study (Sixsmith and Gibson, 2007).

Summary of key findings

The studies included in the review of self-reported wellbeing outcomes for music and singing interventions for adults with dementia are heterogeneous in terms of samples (both the size and the specificity of the dementia diagnosis), settings, and outcomes included. We discuss these in turn as they are important for interpreting the evidence and highlight the need for further research in this area and the challenges of undertaking such work.

There is no consistency in the methods used to define the populations studied such that we cannot be sure that all participants had clinical dementia/mild cognitive impairment. Thus the failure of studies to report changes in wellbeing may reflect the heterogeneity of the populations. All of the studies involved service users which, again, may limit generalisability as we know that most of those with dementia are not receiving support. These groups may have high quality of life because of this engagement with services. Thus we may need to target interventions at those not in contact with services

Our project has focussed upon studies based upon individuals' providing self-report of their quality of life. This can be extremely problematic for people with dementia. We have excluded all studies where quality of life was measured by proxy (through observation either by a carer, professional or researcher). As such this has limited the number of studies included. The need for consistency across our three reports may have resulted in only a highly selective number of studies being included in this review.

These are important factors that mean we have focused upon a specific and exclusive set of studies, and this limitation must be taken into account when interpreting our finding. Our findings are a part of a wider study of self-reported wellbeing outcomes from music and singing interventions for adults. They do not represent a comprehensive evaluation of music and singing interventions for people with dementia. They only relate to those limited number of studies that were based upon self-reported wellbeing outcomes for the person with dementia.

There is low quality evidence that:

Participation in individual personalised music listening sessions can reduce anxiety and/or depression in nursing home residents with dementia and that listening to music may enhance overall wellbeing for adults with dementia.

Review Strengths and Limitations

The comprehensive search strategy ensures that this overview represents a comprehensive summary of all existing eligible studies published prior to the search dates and the pre-publication of our protocol on PROSPERO ensures methodological transparency and militates against potential post-hoc decision making which can introduce bias to the process. Dual screening of searches and data extraction and independent quality assessment of included reviews ensured a rigorous process. Taking published studies as the sole evidence increases the potential risk of publication lag, wherein possible important new evidence that has not yet been included in published reports is not identified and included. However, the grey literature review (Daykin et al., 2016) did include recent unpublished data from studies completed in the last three years.

Implications for practice

We again stress that this report is part of a wider study where the emphasis is upon wellbeing for adults who participated in music and singing interventions. People with dementia emerged as a sub-group within our searches and we considered it important to present the results for this group but acknowledge the limitations of our focus. It is inappropriate to attribute our findings to music and singing interventions for people with dementia where the focus was not explicitly upon promoting subjective wellbeing.

Given these caveats our key findings are that for people with dementia music and singing are important aspects of subjective wellbeing that can promote dimensions of subjective wellbeing, social connections and maintenance of identity. Unlike our previous two volumes listening to music, either as an individual or a group, seemed to be more beneficial than active participation. This is only a very tentative finding which needs support by further research (see below). We would suggest that, on the current evidence base, we should continue to support the development of policy and practice of support for music and singing interventions for wellbeing outcomes for people with dementia but ensure that interventions reflect both active and passive forms of engagement.

Implications for research

A key challenge for establishing evidence in this field is the breadth and diversity of projects and research approaches. Studies included in this review encompass a wide range of music and singing activities in diverse delivery formats, often delivered in specific settings with particular characteristics to a range of different populations. As well as addressing the methodological challenges of quantitative and qualitative research discussed above, situated

research is needed to understand the impacts of music and singing in particular contexts for people with dementia.

The review raises complex questions about the measurement of subjective wellbeing in people with dementia. The use of self-reported measures does not fully reflect the broader research field in which reports by observers are frequently used to assess health, behaviour, wellbeing and quality of life. There is clearly a very strong overlap between clinical and wellbeing research in the field of dementia. This means that there is an ongoing need for a further research on the benefits of music and singing for people with dementia.

A systematic review of the wellbeing outcomes of music and singing in adults and the processes by which wellbeing outcomes are achieved.

Volume 3: Music and singing interventions for adults living with dementia.

Introduction

This is the third of three reports that form the review of wellbeing outcomes of music and singing for adults. The first report (Volume 1) reported studies of music and singing with healthy adults (H1) and included studies with a concurrent comparator (CC) or qualitative studies where it would not be expected to include a comparator (Daykin et al. 2016). Volume 2 includes CC studies with participants who are living with diagnosed conditions but not receiving music and singing interventions as part of clinical treatment (H2). This third and final volume discusses studies of music and singing for the subjective wellbeing of people with dementia.

This review includes studies with a historical comparator (HC) or concurrent comparator (CC). In our previous reports we did not include studies with historical comparators but have included these here because of the paucity of studies identified. We have included qualitative studies where it would not be expected to include a comparator. We have not included clinical studies of music and singing, including interventions for patients in hospital, where the focus is on clinical outcomes. Our initial searches identified a large number of studies examining clinical outcomes such as cognition, and behavioural outcomes such as agitation and wandering. These outcomes are beyond the scope of the current review, which provides an overview of a small sub section of existing research on music and singing outcomes for people with dementia, that focuses specifically upon self-reported subjective wellbeing. We have only included studies where the focus is explicitly upon subjective wellbeing rather than physical or psychological rehabilitation or the management of dementia related symptoms such as agitation. Furthermore, only studies where the person with dementia reported their subjective wellbeing were included. Studies where wellbeing was assessed by proxy such as a carer, health care professional or by observation were excluded. We have not reported outcomes for carers.

The methodologies for data extraction, quality appraisal for the studies reported here are the same as for the H1 and H2 studies detailed in Volumes 1 and 2.

Findings of included papers

We have included 6 dementia studies in this volume. Where we have more than one paper on the same study we have included these as a single study (e.g. Cooke et al 2010a, 2010b). A total of 39 H1 studies were included in Volume 1 and a further 16 in Volume 2: this brings the total of studies included in the review 61.

Study Participants

This part of the review includes data from 249 participants in quantitative and qualitative studies from 4 countries: Australia, Canada, Finland, France, and the United Kingdom. Studies were included where participants were involved in the intervention on the basis of a clinical diagnosis of dementia or mild cognitive impairment (MCI) or scores on a screening measure such as the Mini Mental State Examination (MMSE). In assessing the wellbeing outcomes for participants we consider the specificity of the diagnosis of dementia for the populations studied. Participants in all included studies were in contact with community services (day centres), hospital services or care homes/assisted living environments. This final volume brings the number of participants in quantitative and qualitative research on music, singing and wellbeing outcomes for healthy adults, and those with a diagnosed long-term condition or dementia to 4226.

Music and singing interventions

The diverse music and singing interventions reviewed in this volume are described using a range of terms including music sessions, music therapy, music listening and singing groups. Of the five quantitative intervention studies singing was the focus of three, listening to music in one study; a further study included both. This mirrors the findings of both the H1 and H2 studies where singing was the most common intervention. The intervention was delivered in a group setting in four out of five studies.

Wellbeing measures

The three wellbeing outcomes included in the studies reported were depression, quality of life and anxiety as listed below but not all studies reported outcomes for every measure listed in the study:

- Depression (measured by the Geriatric Depression Scale (GDS) or RAID-a dementia specific anxiety measure)
- Quality of Life (measured by Dementia Quality of Life (DQOL), Dementia Quality of Life (DEM-QoL); or Quality of Life-Alzheimer's Disease (QoL-AD))
- Anxiety (measured by the Hamilton Scale)

Some scales are specific to those with dementia and some relate to the general population which may compromise their utility when used as outcome measures for people with dementia. Most of these measures are well-established measures and have been tested for

reliability and validity. Where there are dementia specific ‘population’ norms these are included in our evaluation to contextualise the types of population included in our review and the magnitude of change observed as a result of the reported interventions. For the depression and anxiety scales there are ‘clinical thresholds’ which are used to distinguish those with/without depression and/or anxiety (and the severity of the condition). These thresholds were used in evaluating the impact of interventions and the assessing the nature of the populations at baseline as appropriate.

Wellbeing outcomes reported

Four studies reported wellbeing in terms of quality of life; three focussed upon depression and two anxiety. We report our findings for each of these outcomes in turn and present an overview of the intervention, the evaluation method used and key findings. At the end of each outcome section we draw together a synthesis of the key findings.

Quality of life

Four studies reported wellbeing outcomes in terms of quality of life but each study used a different measurement tool thereby making direct comparisons problematic.

Cooke et al (2010a) undertook the evaluation of participation in a 40-minute group music programme. This involved 30 minutes singing and 10 minutes pre-recorded music to promote active listening. Instruments were available if required and the group was led by an accompanist and musician facilitator. The intervention took place three times a week for eight weeks. The control was a facilitated reading group and this was interactive. The sessions were conducted across 2 sites. The intervention was delivered as a cross over design. Participants were randomly divided into 2 groups: music and reading. After 8 weeks there was a 5 week ‘washout’ period and the participants swapped groups for the second 8-week intervention period. Maximum group size was 16 in site A and 9 in site B.

Participants were drawn from residents in two long-term care facilities; one was an assisted living centre and one a nursing home. Participants were initially identified by facility managers and had a confirmed or probable diagnosis of dementia as defined by a Mini Mental State Examination (MMSE), an established cognitive function test, score of 12-24. An MMSE score of 18-23 is indicative of mild cognitive impairment and 0-17 as severe impairment. As the primary objective of this study was to look at agitation participants also had to have a documented history of aggression or agitation in the previous month.

A sample size calculation estimated a total sample of 40-50 participants from a potential total population of 158. Sixty-nine participants were considered eligible by staff for the study and

47 were recruited: 24 to the intervention group and 23 the control. Overall 8 in the intervention group did not receive the intervention and 10 in the control arm. In each group the non-participation was in the cross-arm (the second arm) of the study. Data were collected blind to status by researchers and analysis was on an intention to treat basis. Treatment fidelity was addressed by training of facilitators; a treatment protocol and 4 spot checks. Overall 27 out of 47 attended at least 50%+ of sessions.

Cooke et al (2010a) used the Dementia Quality of Life scale. This consists of 5 subscales (self-esteem, positive affect, negative affect, feelings belonging and sense of aesthetics) and an optional single item to assess overall quality of life. All 29 items are rated on a 5-point scale with a mean score being calculated for each subscale. Higher scores indicate higher quality of life. Using the single item mean quality of life scores for the groups at baseline were 3.29 for intervention and 3.57 (control) and were largely stable at follow up (3.25 and 3.22) respectively-these scores are indicative of good quality of life and show no evidence of change over the duration of the study.

Camic et al (2011) undertook a pilot evaluation of a 10 week 'singing together' group based music activity for people with dementia and their carers. This was a pre and post test study with no controls. The activity consisted of a 90 minute session led by a professional musician which focused on signing although percussive instruments were available. Ten people with dementia (and their carers) were recruited from a community mental health service in the UK. Both quantitative and qualitative data were collected from both parties at baseline, on completion of the singing group and 10 weeks later. There was 85% attendance at all sessions. Participants had MMSE scores at baseline of 19 (SD 7.9) which is indicative of dementia. This study used the Dementia Quality of Life scale (Dem-QoL) a 28 item self-completion scale. The scale was completed by both the person with dementia and their carer. Here we only report the scores from the person with dementia themselves. The score range is from 28-112 and higher scores are indicative of better quality of life. Mean scores were 90.67 at baseline; 92.71 at conclusion of the intervention and 84.8 at follow up. This is broadly indicative of a stable and good quality of life and does not demonstrate significant evidence of change over the duration of the study.

Särkämö et al (2013) reports their evaluation of a dyad based music intervention. The intervention was a 10-week group-based music coaching program, which included either singing sessions (SG) or music listening sessions (MLG). The singing and music listening sessions were held weekly (1.5hr/session) at each of the 5 different centres for a groups of 10 participants (5 people with dementia and 5 caregivers), and they were led by a trained music teacher or music therapist. To embed the music activity to the everyday home setting from session 4 onwards participants were given weekly "musical homework assignments". At the final session, the participants were given song books (SG) or compiled CDs (MLG) of their

favourite songs and encouraged to continue the musical activities at home on a regular basis upon completion of the intervention.

Recruitment into the trial was well specified as follows: (a) mild–moderate dementia (Clinical Dementia Rating [CDR] score 0.5–2), (b) no prior severe psychiatric illness or substance abuse, (c) no changes in psychotropic medication during the last 3 months, (d) speak Finnish, and (5) physically and cognitively able to take part in the intervention and undergo the neuropsychological testing. Participants were recruited from 5 centres ranging from day activity to inpatient.

The intervention is evaluated using a single blind RCT study. Participants were randomised to one of 3 arms: singing, listening or usual care. Data were collected at baseline, completion of the intervention (3 months) and 9 months (6 months' post intervention). There was no sample size calculation and no description of measures to evaluate fidelity to the intervention nor details of how missing data were handled. Assessments were conducted blind to group allocation. Of the 89 participants identified, 84 were assessed at completion of the intervention and 74 at 9 months. Analysis was not on an intention to treat basis. At baseline all groups had an MMSE of 20 or below and the listening group had the lowest score of 15. One feature of this population that may limit generalisability is that at baseline all 3 groups scored at least 4 on a scale for rating daily listening to music (maximum score 5); a minimum score of 2 (maximum 4) for daily singing 2 and approximately 50% of each group had a history of music and singing since childhood.

The study reported a number of outcomes but here we only consider subjective self-reported wellbeing. To assess this, the study used the 15 item Quality of Life-Alzheimer's Disease scale (maximum score of 60) with higher scores indicative of better quality of life. At baseline, the scores were 36.2 (singing), 34.9 (listening) and 37.6 (control). At completion of the project the score for the listening group had increased by almost 3 points (estimated from figure). Whilst the benefit for this group had attenuated at 9 months by 1 point the 2 other groups had also decreased by approximately the same amount. Thus at 9 months the scores were 35.2 (singing), 36.9 (listening) and 36.6 (control). Although there is little difference between the groups at follow up there is some evidence to suggest that there was an enhancement of quality of life scores amongst the listening group.

Clemens-Cortes (2013) reports the results of a study from Canada evaluating a Glee Club choral programme in an adult day care population. For 16 weeks' participants took part in a singing activity led by a choir leader and accompanist. Details of the activity were not provided other than session length and duration. The 28 participants included those with (and without dementia), ranged in age from 20 to 90 (mean age 72) and included staff, volunteers and day centre attendees. The study is described as a before-after design: there was no control group.

Quality of life was measured using the assessment of quality of Life (AQoL). The study notes that there were no significant differences in quality of life before-after the intervention but the absolute values are not reported.

One key issue in interpreting change consequent to a music based intervention is normative data indicating how much quality of life changes over time for people with dementia. In addition, it is unclear what different magnitudes of change mean in these measures in terms of the daily lives of individuals. Given the lack of clarity in terms of the natural history of quality of life in people with dementia, a stable or unchanging quality of life could be beneficial if that natural history is one of decrease over time. These caveats mean that the four studies reviewed largely demonstrate overall levels of quality of life are high in the populations studied and are largely stable over time. The music listening interventions, both in a group or individual setting, demonstrated some suggestion that this activity could promote quality of life and that this benefit was evident 6 months after the study.

Depression

Three studies reported wellbeing outcome in terms of the Geriatric Depression Scale (GDS). Two studies, Cooke et al (2010b) and Camic et al (2011), used the 15 item version where the score ranges from 0-15 with a score of 5 indicative of mild depression and 10+ as moderate depression. The study by Guetin et al (2009) used the 30 item GDS score where a score of 10 is indicative of mild depression and 20+ as depression. Both versions of the scale are self-report.

In the study by Cooke et al (2010b) at baseline GDS scores were 3.63 (24 participants - intervention) and 3.96 (23 participants control). The midpoint (crossover) scores were 4.38 and 4.57 respectively and 3.5 and 3.26 post intervention. Thus at each time point depression scores were below the case-definition threshold. A sub analysis of 12 participants with GDS scores of 5+ at baseline showed significant declines from 8.25 to 4.42 for the intervention group and 7.71 to 4.43 for the control. At baseline the mean scores were below the depression case definition threshold and remained there for the duration of the study. Similarly, in the study by Camic et al (2011), GDS scores at each measurement point were below the case definition threshold of 5 (baseline= 2.7 (n=7); end of intervention=4.17 (n=6) and 3.34 (n=7) at follow up.

Guetin et al (2009) undertook a single centre randomised controlled study in a French nursing home of a receptive music therapy intervention. This follows a structured format of music therapy which brings the listener to a state of relaxation and then re-enlivens them. Each participant received a weekly 20 minute music session for 24 weeks linked to their tastes and

delivered in their room via headphones. They could wear eye masks to promote relaxation if required. Control group participants received normal care

Anxiety was the primary end point for this study (see next section). The study was powered to detect a 7-point change on the Hamilton Anxiety Scale. The power calculation was estimated at 11 per group and was increased to 15: a total of 30 participants. All participants had to have a score of 12 on the anxiety score along with a Mini Mental State Examination (MMSE) score of 12-25. Thus an unknown number of participants in this trial were not defined as having cognitive impairment. Participants also had to have the ability to consent and adequate vision/hearing. Assessment was at baseline and weeks 4, 8, 16 (completion of the intervention) and 24 by an independent evaluator.

The paper reports GDS scores for each of the 5 measurement points. At baseline the GDS scores for intervention and control groups were indicative of mild depression at 16.7 and 11.8 respectively. At week 16, the end of the intervention, GDS scores were 8.9 and 11.2. However the benefit in the intervention group had attenuated at 24 weeks where both intervention and control group scores were around 13 and indicative of mild depression.

The three studies focusing upon depression and music therapy for people with dementia demonstrate a similar pattern of fluctuations in depression scores across the lifetime of the intervention. For only one study participants had a score at baseline indicative of depression and this decreased for the intervention group and increased for the control but remained above the mild depression threshold. The remaining two studies did not show evidence of an effect upon levels of depression from the intervention largely because the populations studied had low levels of depression at baseline. This highlights the importance of targeting interventions to those groups where there is the potential to demonstrate change.

Anxiety

Two studies, Cooke et al (2010b) and Guetin et al (2009) report anxiety for their two interventions (described earlier). Cooke et al (2010b) used the RAID an anxiety measure developed for people with dementia. It measures 18 symptoms of anxiety measured on a 3-point scale. The maximum score is 54, higher scores indicate greater anxiety and a score of 11 is indicative of clinical anxiety. Overall the intervention had no effect on anxiety levels which in both groups were below the clinical threshold at baseline and post intervention. (6.17 for the intervention group and 8.22 for the control group and 7.5 and 9.26 post intervention).

Anxiety was the primary outcome for the study by Guetin et al (2009) and this study used the Hamilton Anxiety Scale. This scale ranges from 0-56 and includes 14 items. A score of 17 or less indicates mild anxiety, 18 to 24 mild to moderate anxiety severity and 25 to 30 moderate

to severe anxiety severity. At baseline both intervention and control groups had a mean score of 22 and 21.1 respectively. At the completion of the intervention anxiety levels were stable in the control group but decreased markedly for the intervention group (20.8 compared with 8.4). The differences between the two groups were persistent at 8 weeks post intervention (20.5 for control group patients and 10.6 for intervention groups).

The evidence for the benefit of music therapy in addressing anxiety for people with dementia is inconsistent from these two studies. The group based singing intervention demonstrated no effect of the intervention but in a population with low levels of anxiety. The individually based music listening intervention focussed upon those with mild to moderate anxiety at baseline showed some benefit to the intervention group which persisted beyond the intervention period.

Table 1: Characteristics of included studies (dementia populations)

Authors	Participant Description (include protected characteristics)	Music/singing intervention	Numbers of Participants	Wellbeing outcomes (measures)	Study Design	Conclusions	GRADE or CERqual judgement	DOI
Camic, et al. (2013).	People with dementia or MCI. Age range 65-88 (mean 75 SD 6.7) Plus carers. Recruited from a community mental health service	A 10 week music and singing group intervention. Professionally led. Sessions of 90 minutes (including a break for refreshments).	10 people with dementia and 10 carers	Depression (GDS-10 item), QoL (Dem-QoL-4 scale & Dem-QoL-proxy), behavioural and psychological problems (NPI), activities of daily living (BADLS)	Observational	PWD were deteriorating slowly over the course of the study on all measures but that they and their carers' quality of life remained relatively stable. No difference in QoL measures, an increase in depression and slight deterioration in activities of daily living skills and	Low	http://dx.doi.org/10.1177/1471301211422761

						behavioural and psychological problems		
Clements-Cortes, A. (2013)	Participants aged 20-90 with/without dementia, attending a day centre and centre staff/volunteers. 5 male, 23 female. Age range 26- 90 (M=72. 9, SD=19.7). Predominantly Jewish.	1 hour choir programme for 16 weeks (new to the centre). Free lunch before and coffee/snack after session.	26 (23 attending the day centre, 3 staff)	Fatigue (Stanford Chronic Disease Self-Management Program Questionnaire), self-esteem (Sherer et al.'s self-efficacy scale), anxiety (visual analog scale) Feelings/emotions (PANAS), QoL (AQoL scale)	Observational	No improvement in fatigue, self-esteem, feelings/emotions, anxiety, or QoL with the self-assessed measured used	Very low	http://dx.doi.org/10.1080/01924788.2013.845716

Cooke et al 2010A and B	<p>Participants were recruited from two mixed-gender LTC facilities, which provided low (assisted living) and high (nursing home) care. Both facilities were located north of Brisbane (Queensland, Australia). The majority were: female (70.2%); aged 75–94 (87.2%); widowed (74.5%) and educated at secondary school level (69.6%). Over half of participants had lived in the facility for more than one but less than four years (56.5%) and it was most common for participants to live in the Special Care</p>	<p>Participation in a 40-min live group music programme, involving facilitated engagement with song-singing and listening, three times a week for eight weeks. The maximum size of the group attending the music and reading sessions was 16 at Site A and 9 at Site B</p>	<p>47 (24 intervention and 23 control)</p>	<p>Anxiety (RAID), depression and quality of life (GDS)</p>	<p>Randomised cross-over</p>	<p>Participation in the music programme did not significantly affect anxiety in older people with dementia</p>	<p>Low</p>	<p>http://dx.doi.org/10.1080/13607861003713190 http://dx.doi.org/10.1177/1359105310368188</p>
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	Unit (SCU) (38.3%) or low care (34.0%).							
Guetin et al 2009	Residents in nursing home in France Age 70+ 22 female, 8 male	Individual music therapy-personalised playlist-20 minute sessions for 16 weeks. Control was usual care	30 (15 intervention, 15 control)	Anxiety (Hamilton scale) and depression (30 item GDS)	RCT	Significant improvements in anxiety and depression in the music therapy group as from week 4 until week 16 and sustained for up to 8 weeks after the discontinuation of sessions	Low	http://dx.doi.org/10.1159/000229024

Särkämö et al (2014)	People with dementia and carer dyads recruited from 5 different day activity centres and inpatient centres in Helsinki and Espoo.	1.5hr 10-week singing coaching group, music listening coaching group, or a usual care control group. In addition, the intervention included regular musical exercises at home.	89 (CG=30, LCG = 29, UC=30)	Mood and QOL (Cornell-Brown Scale for Quality of Life and QOL-AD scales)	RCT	Singing and listening to familiar songs, provided by the caregivers of PWDs can be beneficial. Both singing and music listening improved mood. Singing improved emotional well-being of their family members, whereas music listening was found to improve the QOL of the PWDs.	Low	http://dx.doi.org/10.1093/geront/gnt100
Sixsmith, A. & Gibson, G (2007)	People with dementia living in their own homes or residential care homes across England (living in their own	Interviews exploring music in everyday life and participation in music-related activities	26	Open-ended interviews exploring the everyday and enjoyable activities that	Qualitative	Music can enable people to participate in activities that are enjoyable and personally	Low	http://dx.doi.org/10.1017/S014468

	<p>homes in Merseyside, living in their own homes with assistive technologies in Northamptonshire, and living in residential care homes in South Yorkshire, 18 female, 8 males. Age range: 62-96.</p>			<p>people took part in; the reasons why they enjoyed or did not enjoy activities; the factors enabling and constraining the activities; the impact of these activities on the everyday life and wellbeing of the person.</p>		<p>meaningful. It is an important source of social cohesion and social contact, supports participation in various activities within and outside the household, and provides a degree of empowerment and control over their everyday situations.</p>		<p>6X0600 5228</p>
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Table 2: Numerical summary (dementia studies)

Journal author (date)	Intervention	Outcome description	Baseline		Follow up 1		Follow up 2		Grade
			Intervention Numbers Mean (SD)	Control Numbers Mean (SD)	Intervention Numbers Mean (SD)	Control Numbers Mean (SD)	Intervention	Control	
Camic et al (2011)	Group singing	Dementia Quality of Life DEM-QoL	N=9 90.67 (13.28)		N=7 92.71 (18.310)		N=5 84.80 (20.75)		Low
		Geriatric Depression Scale (GDS) (15 item version)	N=7 2.71 (2.3)		N=6 4.17		=7 3.34		
Geurtin et al (2009)	Individual music listening	Anxiety (Hamilton scale)	N=15 22 (5.3)	N=15 21.1 (5.6)	N=14 8.4 (3.7) p = 0.01	N=12 20.8 (6.20)	N=13 10.6 (6.30) p < 0.01	N=11 20.5 (5.4)	Low
		GDS (30 item version)	N=15 16.7 (6.2)	N=15 11.8(7.4)	N=14 8.9 (3.3) p < 0.01	N=12 11.2 (6.1)	N= not reported 13.0** p < 0.01	N=not reported 13.0	

Clements-Cortes, A. (2013)	1 hour choir programme for 16 weeks (new to the centre).	Sherer et al.'s (1982) self-efficacy scale			N = 28 General efficacy (p=0.20) Social efficacy (p=0.37)			Very Low
		PANAS Scale			N = 28 Positive affect (p=0.47) Negative affect (p=0.13)			
		Self-report measures of anxiety			N = 28 (p=0.77)			
		AQoL Scale			N = 28 Independent Living p=0.46 Relationships p=0.62 Mental Health p=0.56 Coping p = 0.42			

					Pain p = 0.21 Senses p = 0.45 Self-Worth p=0.68 Life Satisfaction p= 0.21				
Cooke et al (2010a and 2010b)**	Group music and reading group (control)	Anxiety (Raid)	N=24 6.17	N=23 8.22	N=24 7.58	N=23 11.26	N=24 7.50	N=23 9.26	Low
		Dementia quality of life (DQOL)	N=24 3.29	N=23 3.57	N=24 3.38	N=23 3.09	N=24 3.25	N=23 3.22	
		GDS (15 item version)	N=24 3.63	N=23 3.96	N=24 4.38	N=23 4.57	N=24 3.5	N=23 3.26	
Sarkamo et al 2013	Singing (S), music (ML) listening & usual care	QOL-AD = Quality of Life in Alzheimer's Disease	S N =30 36.2 (6.3) ML N = 29 34.9 (5.0)	N=30 37.6 (5.3)	S N = 27 36.2 ML N = 29 37.9	N = 28 37.6	S N = 23 35.2 ML S = 28 36.9	N = 23 36.6	Low

** ESTIMATED

Discussion

The quantitative studies included in the review of wellbeing outcomes from music and singing for adults with dementia are heterogeneous in terms of samples, settings, and outcomes included. We discuss these in turn as they are important for interpreting the evidence and highlight the need for further research in this area and the challenges of undertaking such work.

There is no consistency in the methods used to define the populations studied such that we cannot be sure that all participants had clinical dementia/mild cognitive impairment. Thus the failure of studies to report changes in wellbeing may reflect the heterogeneity of the populations. All of the studies involved participants who were service users which, again, may limit generalisability as we know that most of those with dementia are not receiving support. These groups included in these studies may have high quality of life because of this engagement with services. Thus we may need to target interventions at those not in contact with services

Our project has focussed upon studies based upon individuals' providing self-report of their quality of life. This can be extremely problematic for people with dementia. We have excluded all studies where quality of life was measured by proxy (either by a carer, professional or researcher report or by observational assessment). In line with our H1 and H2 studies we have reported participants own assessment of their wellbeing. However, when focussing upon people with dementia, this has limited the number of studies included because of our focus upon both self-report and wellbeing outcomes. The need for consistency across our three reports may well have resulted in only a highly selective number of studies being included in this review.

We have also excluded clinical studies, although there is a high degree of overlap between clinical and non-clinical research. Our initial searches revealed a relatively large number of studies of music and singing for people with dementia that examined outcomes such as cognition, memory and behavioural symptoms such as agitation. These are outside the scope of our review of self-reported subjective wellbeing.

The range of measures used make it difficult to synthesise findings. Furthermore, the low levels of anxiety and depression and good to high levels of quality of life make it difficult to detect change given the influence of ceiling effects. This suggests a need to better target interventions if depression or anxiety are the primary outcomes as in the study by Guertin et al (2009).

Although the studies identified were problematic there was one finding that was consistent across two studies and this was the potentially beneficial effect of listening to music rather than singing. This was evident in two very different samples from France and Finland and in both group and individual setting and merits further investigation.

Qualitative studies

Two mixed methods studies, those by Camic et al (2011) and Clements-Cortes (2013) included qualitative elements. Camic undertook a longitudinal qualitative study interviewing the person with dementia and their carer at each of the three study time points. Clements-Cortes (2013) interviewed participants on completion of the study. In both studies interviews were audio recorded and transcribed. Camic et al (2011) used thematic coding whilst the method used in the other study was less clear.

Also included in this part of our review is a qualitative paper by Sixsmith and Gibson (2007) which was part of a larger ESRC funded project on technology and the promotion of quality of life of people with dementia. This involved purposive sampling of 26 individuals who lived in the community or residential care and who were in contact with services or voluntary organisations such as the Alzheimer's Society. The interviews were not focused upon music per se but on the everyday and enjoyable activities individuals took part in, why they did those activities, what were the barriers/facilitators to undertaking those activities and their impact upon their wellbeing. From this analysis music and music related activities emerged as being particularly important. Listening to music in various forms was reported by at least two thirds of participants whilst a third were active in singing or playing musical instruments.

In Volumes 1 and 2 we identified three dimensions of subjective wellbeing reported in qualitative studies. These included *personal wellbeing*, *social wellbeing* and *self-identity*. For the three studies we have included the key themes that are reported *broadly* mirrored those from H1 and H2 studies.

The qualitative findings were:

- **Music is meaningful and important to participants.** People with dementia who took part in the music and singing projects or the study by Sixsmith and Gibson (2007) report personal wellbeing benefits including relaxation, reduced anxiety, improvements in confidence and fun and enjoyment.
- **Music provides social connections.** Participants with dementia who took part in music and singing projects or the study by Sixsmith and Gibson (2007) experienced

positive social outcomes in terms of friendship, social engagement and sharing social connections.

- **Music as a means of empowerment and identity.** Sixsmith and Gibson (2007) and others also noted the potential of music as a means of control over their own lives. Sixsmith and Gibson (2007) in particular focused upon the barriers contemporary music devices could present for those with dementia who wanted to listen to music in particular.

Summary of key findings

As noted earlier most studies included in the review failed to demonstrate changes in subjective wellbeing outcomes as the populations studied already had high levels of wellbeing on the measures included. However, the focus of this report is subjective wellbeing as reported by participants. Consequently, we have excluded studies and findings where the methodology entails observation by a researcher or clinician of the effects of music and singing on the wellbeing of people with dementia. In addition, we have excluded studies where the outcome was defined in terms of dementia or clinical symptoms or where the focus was on outcomes for carers.

These are important factors that mean we have focused upon a specific and exclusive set of studies and this limitation must be taken into account when interpreting our findings. Our findings are a part of a wider study of self-reported wellbeing outcomes from music and singing interventions for adults. They do not represent a comprehensive evaluation of music and singing interventions for people with dementia—they only relate to those limited number of studies that reported wellbeing outcomes.

There is low quality evidence that:

Participation in individual personalised music listening sessions can reduce anxiety and/or depression in nursing home residents with dementia and that listening to music may enhance overall wellbeing for adults with dementia.

Completeness of the included evidence

As we noted in both previous volumes a challenge for this review has been the large number of hits following searches for music and singing interventions that support wellbeing. There is a degree of overlap between clinical and subjective wellbeing outcomes in research with people with dementia, and subjective wellbeing is not always a primary outcome of

interventions for this group. As a consequence we acknowledge that some relevant evidence has not been included in this report. Again in interpreting our findings it is important that they are not attributed beyond the populations studied.

Quality of the included evidence

As with our previous reports the application of GRADE and CERQual criteria led to the assessment of studies as predominantly low, moderate or high quality. For quantitative research the highest grades are given to well-designed studies such as randomised trials where there is consideration of treatment and comparison conditions, intervention fidelity, sampling, attrition, control of confounding factors, measurement validity and reliability, analysis and treatment of missing data. In relation to qualitative research, the highest grades are given to well-designed studies that consider recruitment, sampling, data collection, data analysis, reflexivity, ethics and value. A high rating indicates that the findings are a reasonable representation of the phenomenon of interest. In studies focussing upon dementia for both approaches specification of the diagnosis of dementia is an additional quality criterion. No studies considered co-morbidity which may well be an important element of wellbeing for this population.

Of the six studies included in this review there were three RCTs, two mixed methods observational studies with historical controls (before-after studies) and one qualitative study. The three RCTs were judged to be low quality because of small sample sizes (sample sizes ranged from 30 to 89). Numbers in each group were small. There was often a lack of clarity as to the degree of dementia in the samples included. Problems with attrition and missing data were variably addressed, and specificity of the setting making it difficult to generalise results. Confounding and fidelity were rarely thoroughly addressed.

The observational studies were graded as very low because of specificity of the settings, issues over the nature and composition of the samples, the small sample sizes (10-28) as well as weaknesses in the qualitative elements of the studies including presentation of qualitative themes, lack of a clear audit trail for the generation of the themes, only reporting positive experiences of the interventions. However, one study was a pilot study and therefore the issues raised may be addressed in a definitive trial.

Strengths and Limitations of the review process

The comprehensive search strategy ensures that this overview represents a comprehensive summary of all existing eligible studies published prior to the search dates and the publication of our protocol on PROSPERO ensures methodological transparency and militates

against potential post-hoc decision making which can introduce bias to the process. Dual screening of searches and data extraction and independent quality assessment of included reviews ensured a rigorous process. Taking published studies as the sole evidence increases the potential risk of publication lag, wherein possible important new evidence that has not yet been included in published reports is not identified and included. However, the grey literature review (Daykin et al. 2016) did include recent unpublished data from studies of music and singing for people with dementia completed in the last three years.

The use of the GRADE and CERQual criteria, as with any evidence grading scale, inevitably introduces an element of subjective judgement. A consistent approach to judgements across the different interventions has been applied but it should be recognised that these judgements are open to interpretation.

However, we again stress that this report is part of a wider study where the emphasis is upon wellbeing for adults who participated in music and singing interventions. People with dementia emerged as a sub-group within our searches and we considered it important to present the results for this group but acknowledging the limitations of our focus. It is inappropriate to attribute our findings to music and singing interventions for people with dementia where the focus was not explicitly upon promoting wellbeing.

Implications for practice

Given these caveats our key findings are that for people with dementia music and signing are important aspects of subjective wellbeing that can promote domains of subjective wellbeing, social connections and maintenance of identity. Unlike our previous two volumes active participation seemed to be less beneficial than listening to music but this is only a very tentative finding which needs support by further research (see below). We would suggest that, on the current evidence base, we should continue to support the development of policy and practice of support for music and singing interventions for wellbeing outcomes for people with dementia but ensure that interventions reflect both active and passive forms of engagement.

Implications for research

A key challenge for establishing evidence in this field is the breadth and diversity of projects and research approaches. Studies included in this review encompass a wide range of music and singing activities in diverse delivery formats, often delivered in specific settings with particular characteristics to a range of different populations. As well as addressing the methodological challenges of quantitative and qualitative research discussed above, situated

research is needed to understand the impacts of music and singing in particular contexts for people with dementia.

The review raises complex questions about the measurement of subjective wellbeing in people with dementia. We have concentrated on studies using self-reported measures, and this does not necessarily reflect the broader research field in which reports by observers are frequently used to assess health, behaviour, wellbeing and quality of life. We have not included data on carers. There is clearly a strong overlap between clinical and wellbeing research in the field of dementia, more than is the case in the healthy populations and the targeted populations with identified health conditions. This means that there is still a need for a further research on the benefits of music and singing for people with dementia and their carers.

References

Included Studies in H2 Dementia Report

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Appendix 1: Reasons for exclusions in the H2 (not dementia) category

Authors	Year	DOI	Reason for Exclusion (see Vol. 1 for reasons)
Allen J.	2010	n/a	Study design
Auge, Mercadal-Brotons & Resano	2015	http://dx.doi.org/10.5209/rev_PSIC.2015.v12.n1.48907	Comparator
Baker, Felicity Anne; Rickard, Nikki; Tamplin, Jeanette; Roddy, Chantal	2015	http://dx.doi.org/10.3389/fnhum.2015.00299	Comparator
Batavia,A. I.; Batavia,M.	2003	http://dx.doi.org/10.1080/0963828021000031025	Study design
Erkkila, Jaakko; Punkanen, Marko; Fachner, Jorg; Ala-Ruona, Esa; Pontio, Inga; Tervaniemi, Mari; Vanhala, Mauno; Gold, Christian	2011	http://dx.doi.org/10.1192/bjp.bp.110.085431	Population
Hanser, S.B., Bauer-Wu, S., Kubicek, L., et al.,	2006	http://dx.doi.org/10.2310/7200.2006.014	Population
Lipe,A. W.;Ward,K. C.;Watson,A. T.;Manley,K.;Keen,R.;Kelly,J.;Clemmer,J	2012	http://dx.doi.org/10.1016/j.aip.2011.11.002	Comparator
Lord,V. M.;Cave,P.;Hume,V. J.;Flude,E. J.;Evans,A.;Kelly,J. L.;Polkey,M. I.;Hopkinson,N. S.	2010	http://dx.doi.org/10.1186/1471-2466-10-41	Population
Mandel, Susan E.; Davis, Beth A.; Secic, Michelle	2014	http://dx.doi.org/10.1080/00185868.2014.906830	Population
McCaffrey, R	2011	http://dx.doi.org/10.1136/ebn1148	Study design
Mezey, G.; Durkin,C.; Krljes, S.	2015	http://dx.doi.org/10.1080/14789949.2015.1069881	Population
Sekhon, P.;Piccoud,I.;Wadibia,M.; Soni,S.; Dhairyawan, R.	2014	n/a	Study design
Stordahl, J.	2009	n/a	Study design

Reasons for Exclusion:

- **Population** - Does not include the population of interest i.e. adult participants, worldwide, living with a chronic health condition but are not undergoing active treatment excluding paid professionals
- **Outcome** - Does not include outcomes of interest i.e. subjective wellbeing measured as an outcome measure using a recognised measure/method
- **Intervention** - Does not include interventions of interest i.e. interventions focused on music or singing including listening, performing and music therapy offered to enhance wellbeing (Excluding clinical music therapy, clinical procedures, medical tests and diagnostics)
- **Study design** – Is not a study design of interest i.e. primary study with empirical data of wellbeing outcomes and processes by which wellbeing outcomes are achieved. Quantitative, qualitative or mixed methods. Published between 1996-2016
- **Comparator** – does not use a comparator e.g. no music or signing, white noise, usual routine i.e. inactive comparator
- **Redundant** – the authors have published a more recent study which includes and expands upon the paper excluded